3rd National Conference
on
Natural, Farming, Organic Farming and Chemical, Farming in Indian Agriculture Present Scenario and Way Forward

ABSTRACT BOOK

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THIRD NATIONAL CONFERENCE ABSTRACT BOOK

(Natural, Farming, Organic Farming and Chemical, Farming in Indian Agriculture Present Scenario and Way Forward)

Editors
Dr. Manoj Sharma
Dr. Madhu Shelly
Dr. Kusum Rana
Dr. K.B. Singh
Dr. D.S. Tomar
Dr. Kanchan Sandhu

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Dr. Simerjeet Kaur

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Technical Sessions

FOREWORD

Dear Readers

It gives us immense pleasure while sharing with you that this time, a large number of abstracts (186) have been received under different proposed thematic areas. All these abstracts were edited by a team of scientists duly authorized by the executive committee of the Society of Krishi Vigyan. However, some colleagues did not mention thematic area under which an abstract was to be indexed, therefore, we have put at our own level under the appropriate thematic area. It is worth to mention that maximum number of abstracts (34) was received under the area "Integrated nutrient, disease, weed and pest management in crop production". Hence, after deliberations during the conference on all these topics, some salient recommendations would come out which may be helpful in planning the future course of action by the scientific community in the country. In fact every effort has been made to include maximum number of abstracts received by the editorial team but even then there may be some errors and omissions on our part. Kindly ignore that. At last, we appreciate all the eminent scientists who have put lot of efforts in preparing research paper and its abstract for presentation in the 3rd National conference of the Society of Krishi Vigyan (www.iskv.in) being organized at the Hotel Imperial Grand, Ujjain by the Krishi Vigyan Kendra working under the aegis of the Rajmata Vijaya Raje Sciendia Krishi Vishwa Vidyalaya, Gwalior.

We the editorial team of this abstract book express our gratitude to the executive of this society for showing faith and giving us an opportunity to compile and edit this important publication of the society. We also sincerely thank the officials of M/s Foil Printers, Ludhiana for its decent designing, printing and bringing out in the present form.

(Editors)

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Technical Session : A

Impact of climate change on agricultural production.

A1

ASSESSMENT OF WHEAT GENOTYPES FOR PHENOLOGY, ACCUMULATED HEAT UNIT AND YIELD UNDER DIFFERENT THERMAL REGIME

Sanjay Jain and V.K. Verma*

Krishi Vigyan Kendra, Betul Jawaharlal Nehru Krishi Vishwa Vidyalaya
Email:kvkbetul@rediffmail.com

ABSTRACT

Temperature is an important environmental factor influencing the growth and development of crop plants it directly determines the days taken to complete different phenophases and consequently the rate and duration of the crop growth. The phenology and ambient temperature interaction in wheat is important because under double cropping system, early and late sown wheat crop faces stress with high temperature during reproductive stage. Hence, a study was conducted to determine the effect of ambient temperature on different phenological development and their accumulated heat unit of wheat genotypes.

The experiment was laid out continuously for two years at Krishi Vigyan Kendra, Betul in split plot design with three replications with three sowing dates were placed in main plots and six wheat cultivars were in sub plots. Six advance genotype (ESWYL-145, 3rd CSISA HIEM-10212, 3rd CSISA HTEM-10225, 31st ESWYT-107, 31st ESWYT-123 and local check GW-366) received from Borlaug Institute of South Asia (BISA), Jabalpur were used as study materials. Results showed that days for attainment of different phenological stages differed significantly due to sowing dates. The Early sown (October) wheat crop took more days for maturity compared to normal (November) and late sowing (December). Crop planted in the month of October taken more number of days (132) than November and December to attain physiological maturity of crop. Lowest days (104) taken by December sown crop. As for as the genotype is concerned "3rd CSISA HIEM-10212 and 3rd CSISA HTEM-10225" taken more number of days for attaining different phenophases whereas days taken by other varieties did not varied much. The thermal times accumulation (GDD) for physiological maturity for different sowing dates and genotypes was in same order as days taken for physiological maturity of crop. The highest seed yield of wheat crop was noted under November sown crop and lowest yield with December sown this may due to sub optimal photo-thermal condition. Among genotypes 3rd CSISA HIEM-10212 produced higher seed yield than others.

A2

EVALUATION OF DIFFERENT FODDER CROPS UNDER CHANGING CLIMATE CONDITION TO ENSURE GREEN FODDER AVAILABILITY IN MALWA PLATEAU ZONE.

Lal Singh, Suraj Kashyap, Shalini Chakraborty, Vinod K. Mittoliya and Rupendra Khandwe

RVSKVV, Krishi Vigyan Kendra, Rajgarh M.P.
Email:lalsingh_sagar@rediffmail.com

ABSTRACT

A field trial was conducted during rabi season 2018-19 at research farm of RVSKVV Krishi Vigyan Kendra, Rajgarh, Madhya Pradesh to in Indian agriculture there was animals is an important component in farm income. Indian farmers are depend on animals for there livlihood and other agriculture requirements. There was a scarcity of green fodder in diet of live stock were rearing by farmer due to climate change. Green fodder was an important part of dietery requirement of animals. to ensure the availability of green fodder during lian period. The trial was laid out in Randomized Block Design in three replications with comprising of six treatments T1-Makkhan grass, T2-Barseem (JB-1), T3 -Kasnu (Local), T4- Lucerne (Ananad 2), T5-California (Rye Grass), T6-Oat (JO-1). The result of experiment was indicated that use of makkhan grass for ensureing the green fodder availability during lain period is significantly higher over other treatments in context of yield and economics.

A3

MITIGATING STRATEGIES ADOPTED BY PROGRESSIVE FARMERS FOR CLIMATE CHANGE IN NARMADA DISTRICT

V. K. POSHIYA[1] , M. V. TIWARI [2] and P.D.VERMA [3]

1 Assistant Professor, TWTC, Dediapada NAU, Narmada, Gujarat
2.Scientist, (Home Sci), KVK, NAU, Dediapada
3.Senior scientist and Head (Ext.Edu), KVK NAU, Narmada
Email: vkposhiya @nau.in

ABSTRACT

Agriculture is the one of sensitive areas upon which society depends for food, feed and fiber that enables sustainable livelihoods of farmers. It is one of the sectors that are most vulnerable to climate change. It poses a major threat to food security. Climate system is unequivocal, as any increase in temperature, diurnal variations and changes in patterns and intensity of rainfall have massive effects on agriculture. Therefore, climate change is being considered as a serious threat to the livelihood of farmers. It is essential for the farmers to adopt mitigating strategies for climate change effects to sustain the agricultural production. Hence, there is need to enhance the knowledge and adoption of progressive farmers about climate change in Narmada district.

NATURE-BASED SOLUTIONS FOR AGRICULTURAL SUSTAINABILITY AND CLIMATE RESILIENCE IN NEH REGION, INDIA

Sanjay Swami

Professor (Soil Science and Agricultural Chemistry), School of Natural Resource Management, College of Post Graduate Studies in Agricultural Sciences, Central Agricultural University, Umiam (Barapani) - 793 103, Meghalaya, India
E-mail: sanjayswamionline@gmail.com

ABSTRACT

Nature-based Solutions (NbS) encompasses a variety of practices that, in many cases, have been used for decades, are based on indigenous knowledge or were known under different names like conservation agriculture, climate smart agriculture, etc. Often, the term `Nature-based Solutions´ is used as an umbrella concept to cover a range of ecosystem related approaches including ecosystem-based adaptation, natural climate solutions, and green infrastructure. In North Eastern Hill (NEH) region of India, the environment, local conditions, socio-economic and socio-cultural life of different tribal communities and their rituals associated with agricultural practices have given basis for development of many indigenous farming systems, which have in-built Nature-based Solutions for conservation, preservation and utilization of natural resources. The rice-fish system of *Apatani* tribe in Arunachal Pradesh**,** *ZABO* farming system and *Alder* based farming system in Nagaland, bun cultivation and **bamboo drip irrigation system** in Meghalaya are good examples of location specific Nature-based Solutions in agriculture. My presentation will deal with these important Nature-based Solutions being followed in the NEH region for agricultural sustainability and climate resilience.

PERFORMANCE OF CLIMATE RESILIENT FARMING MODELS FOR DIFFERENT FARMING SYSTEM TYPOLOGIES IN SUNDARBANS

P. K. Garain

Ramkrishna Ashram KVK, Nimpith, South 24 Parganas, West Bengal – 743338, India
Email: pkgarain79@gmail.com

ABSTRACT

Sundarbans, the world's largest contiguous stretch of mangrove forest, is highly vulnerable to tropical cyclones and erratic distribution of rainfall. High storm surge during cyclones often breaches the river embankment, forcing saline river water to inundate the inland. Intensive rainfall within short period of time leads to prolonged water stagnation in the low lying and ill drained crop fields where long duration and low yielding traditional rice varieties are the only option. Late onset of monsoon, uneven distribution of rainfall and intermittent dry spells hamper the *kharif* crops equally. The winter and summer seasons witness acute dearth of freshwater for irrigation and soil salinity, rendering huge areas to remain fallow. To mitigate such climatic vulnerabilities, climate resilient agricultural technologies were demonstrated in a cyclone prone village 'Bongheri". Based on the existing farming system typologies of the area (rainfed lowland, rainfed medium land, irrigated lowland, irrigated medium land and irrigated upland), different modules of climate resilient technologies like mangrove barrier, land shaping, land embankment cultivation, broad bed cum trench system, flood and salinity tolerant crop varieties, animal health management, alternate livelihood options (backyard poultry, Asian catfish hatchery, ornamental bird), community seedbed, custom hiring centre, etc., were implemented. The climate smart village, could withstand the recent climate vagaries when four more cyclones (*Fani* and *Bulbul* in 2019, *Amphan* in 2020 and *Yaas* in 2021) lashed upon Sundarbans. The mangrove barrier protected the river bund from the storm surge, improved drainage ensured quick recession of flood water and the additional storage structures harvested the excess runoff for irrigation. The farmers this time, were ready with an array of climate smart technologies to outsmart the climatic vagaries, adapt to the changing climate and resilient enough to sustain their livelihood.

ROLE OF CLIMATE SMART AGRICULTURAL PRACTICES IN ADOPTION OF ZERO TILLAGE IN RICE-WHEAT CROPPING SYSTEMS IN MUZAFFARPUR DISTRICT OF BIHAR, INDIA

***M.L. Meena, Ipsita Biswas, Nidhi Kumari, Arpita Nalia and B.C. Anu**

Krishi Vigyan Kendra, Turki, Muzaffarpur (Bihar) 843121
*Email:mlmeenacazri@gmail.com

ABSTRACT

Zero tillage is a complete farm management system that should include many agricultural practices, including planting, plant residue management, weed and pest control, harvesting, and crop rotations. Diffusion and benefits of ZT in Bihar work on ZT in Muzaffarpur district started as early as in the 2012 by, but it was not successful due to technical difficulties, such as lack of adequate planting equipment and difficulty in chemically controlling the weeds. It restarted in 2020 with introduction of inverted ZT openers by the Climate Resilient Agriculture Project (CRAP) started by Govt. of Bihar. In 2020-21 a prototype was developed at Dr. Rajendra Prasad Central Agricultural University, Pusa. After many refinements and adaptation of ZT machine in 2020, about 50 ZT drill machines were supplied to farmers and KVK, Turki. This was done to better understand the problems in machine operations. The combined efforts of CRAP project, Rice-Wheat Consortium for Indo-Gangetic Plains and KVK, Turki resulted in wide spread adoption of ZT after the turn of the century. It is estimated that approximately 540 hectare area is under ZT and reduced tillage in Muzaffarpur district (RWC 2020), covering district of all blocks and the impact of ZT was 54.6%, adoption of ZT in rice-wheat cropping system 59.4%, respectively. The results confirm the trend of slowing down of productivity growth of rice and wheat in Muzaffarpur for adoption of ZT in rice wheat cropping system. The rate of varietal improvement and notification has increased for both the crops, but there is varietal concentration in both the crops. The zero tillage in wheat and crop variety improvement is the major technological interventions in the systems, which have generated the returns to the order of 89.5% in 2021. The estimated IRR is 41.4% and the ratio of net benefits to the cost is 2.9 in zero tillage rice-wheat cropping system.

SMOKY BLIGHT CANKER IN HIMACHAL PRADESH

Kirtipal Singh and J N Sharma

Department of Plant Pathology, College of Horticulture, Dr Yashwant Singh Parmar University of Horticulture and Forestry, Nauni-Solan, HP-173230
Email:kirtipaljat@gmail.com

ABSTRACT

Smoky blight canker caused by *Botryosphaeria obtusa* is one of the most important diseases of apple causing significant losses in apple production. Enormity of smoky blight in different locations i.e., Sirmaur, Kullu, Mandi, Kinnaur and Shimla district of Himachal Pradesh, located at different altitudes ranging between 900-2500 m above mean sea level (a.m.s.l.), were carried out during normal canker development period i.e., May to December during two consecutive years 2017 and 2018. Smoky blight canker was widespread in Sirmaur, Kullu, Mandi, Kinnaur and Shimla district of Himachal Pradesh and was more prevalent and occurred frequently in almost all apple growing areas surveyed. The incidence of smoky blight was maximum (64.94%) at Charna of Sirmaur district followed by Thunag of Mandi district (63.81 %), whereas it was minimum at Pooh (2.16%) followed by Bhavanagar (2.70%) in district Kinnaur. Whereas, percent disease index of smoky blight was maximum at Charna (43.20%) followed by Hariphurdhar (41.00%) in Sirmaur district, while minimum percent disease index was at Bhavanagar (0.10%) followed by Moorang (0.53%). The mean percent disease index in the survey years for smoky blight canker ranged from 0.10 to 43.02 per cent.

EFFICIENT NUTRIENT MANAGEMENT IN MAIZE-MUSTARD BASED RAINFED CROPPING SYSTEMS UNDER DIFFERENT TILLAGE PRACTICES

Gaurav Mahajan, V. K. Paradkar, Shikha Sharma and Hemlata Ahirwar,

AICRP on Maize, Zonal Agricultural Research Station, J.N.K.V.V, Chhindwara, M.P. 480001, India
Email:aicrpagrorewa@gmail.com

ABSTRACT

Conservation has assumed importance in view of widespread resource degradation. There is an urgent need for identification of alternate crops and cropping system. Keeping these facts in consideration, the present investigation was carried out to find out Efficient Nutrient management in maize-mustard based rainfed cropping systems under different tillage practices. The study was conducted during *Kharif* season of 2019, 2020 & 2021 consecutively at a fixed site at JNKVV, Zonal Agriculture Research Station, Chandangaon, Chhindwara. It is situated at a height of 682m above mean sea level with a latitude range of 21° 28' N and longitude range of 78° 10' E. It receives an average rainfall of 1080 mm during the crop period the rains were normal. The experiment was laid out in split block design keeping with nine treatments. The main plot treatments included tillage viz: Zero till (ZT), Conventional Till (CT) and Permanent bed (PB)where as sub plot treatment includes Nutrient management techniques viz: 33% RDN (N_1) ,Recommended Dose of Fertilizer (N_2) and SSNM based on nutrient expert (N_3) where the RDF was 120:60:40; N:P_2O_5:K_2O kg/ha.Results indicates that agronomic performance (yield attributes) of 3rdcycle maize grown in maize–mustard rotation was maximum with ZT and PB; however the highest grain yields (82 qha^{-1}) was produced under ZT–FB plots and Stover yield (153 qha^{-1}) under PB plots. The nutrient content and their uptake at different growth stages increased under conservation tillage (ZT; PB) with SSNM than conventional tillage practices. Economic profits from maize under maize–mustard rotation were invariably higher in ZT with SSNM plots, while in terms of cultivation cost; conventional tillage was the costliest treatment. The soil–bulk density under conservation based practices (Z Tand PB) was lowered by ~1.8–2% in 0– 30 cm soil profile than conventional practices after the harvest of 3rd season maize. After 3rd cropping cycle of maize–mustard rotation, soil organic carbon increased ~7.8– 8% under conservation based tillage practices over CT. Thus, the results of study suggests that conservation based tillage practices with selected nutrient management options are profitable on sustainable basis for higher maize yields under maize-mustard based rainfed cropping systems

Technical Session : B

Climate smart resilient technologies and good agricultural practices for doubling farmers' income

B1

ADOPTION BEHAVIOR OF TRIBAL'S TOWARDS INTRODUCED TECHNOLOGIES FOR INCOME GENERATION IN TUENSANG DISTRICT OF NAGALAND.

Longma Yanger Pongen and Pijush Kanti Biswas

Krishi Vigyan Kendra,Tuensang Kuthur (Nagaland)
E-mail : longmakvk@gmail.com

ABSTRACT

Tribal communities dominate Tuensang district of Nagaland, which lies on the eastern part of India, bordering Burma. The tribesmen mainly depend on jhum farming. They practice subsistence agriculture and rely on the produce obtain from jhum fields. They mainly grow maize, kholar (Rajmash), millet as their main crop. Due to hilly terrain of the district very little scope remains for permanent cultivation and also the unpredictable weather condition adding up more constrain. The present study was conducted to understand the impact of scientific intervention carried out by KVK Tuensang during the last few years, their impact in terms of economic and physical growth, adoption behavior of different enterprise leading to doubling their income.

APPROPRIATE TECHNOLOGIES FOR BOOSTING FARMERS' ECONOMY THROUGH CLUSTER FRONTLINE DEMONSTRATION IN MALWA PLATEAU OF CENTRAL INDIA.

D.S.Tomar, Rekha Tiwari and R.P. Sharma

Krishi Vigyan Kendra, RVSKVV, Ujjain (M.P)
E-mail : tomardivakar66@gmail.com

ABSTRACT

Achieving aim to make the country self-sufficient in oilseeds and pulses would have a great impact on agricultural economy and would help in reducing dependence on foreign markets. India is in the need of a second yellow revolution not only to fulfill the requirement of edible oil but also to minimize the import of oilseed. Thus, a technical breakthrough is needed to increase productivity and farm income through oilseed cultivation. Indian Council of Agricultural Research has initiated Cluster Frontline Demonstration in Oilseed with financial support of the Department of Agriculture and Farmers Welfare, Ministry of Agriculture and Farmers Welfare, Government of India. It is a unique approach which provides a direct interface between scientists and farmers with the objective of demonstrating newly released crop production and protection technologies and its management practices in the farmers' field under different agro-climatic regions and farming situations. The farmers were guided by the KVK scientists during demonstrations in implementation of improved technologies like land preparation, seed treatment, IPM, INM, Drought management and contingent plan in the event of any natural vagary etc.

Hence, it can be concluded that all the modern relevant, location specific technologies when used in harmony are capable to increase the productivity and profitability by more than 30 percent.

CLIMATE SMART RESILIENT TECHNOLOGIES AND THEIR IMPACT ON THE SOCIO-ECONOMIC STATUS OF RURAL FARMERS THROUGH THE NATIONAL INNOVATION ON CLIMATE RESILIENT AGRICULTURE PROJECT

Kehar Singh Thakur*, Rajeev Raina, Sushil Dhiman, and Jaya Chaudhary

Krishi Vigyan Kendra Chamba at Saru-176 314
Dr. Yaswant Singh Parmar University of Horticulture and Forestry,
Nauni, Solan (Himachal Pradesh), India
Email: thakur.kehar.kst@gmail.com

A manifold increase in the resource-use efficiency in crop production can be obtained through protected cultivation compared to open-field conditions. In protected cultivation, high-value cash crops, vegetables, and flowers are grown and managed under controlled conditions with higher per unit productivity and profitability. Water scarcity, drought, dry spell, delayed monsoon, cold waves, and prolonged winter season are major climatic vulnerabilities of Lagga village. Runoff is common, drying of water bodies, stunted growth of crops, low yield, high incidences of insect pests and diseases, fodder scarcity in winter, and migration of small farmers are the consequences of these climatic vulnerabilities. We carried out four interventions namely Natural Resource Management, Crop Production, Livestock and Fishery, and Institutional Interventions during this project period. Earlier this area has a single cropping system. Maize was the area's major crop to meet their domestic requirements and farmers were very poor. But now maize, cabbage, cauliflower, apple, beans, and potato are major crops grown in this area. Farmers of this area have small land holding that was too without irrigation facilities. To grow cash crops in open is not profitable as the quality of the product is not good. Initially, in the year 2012, two poly-houses were constructed in the NICRA village but now more than 107 poly-houses have been constructed, as result, the farmers of other villages are also adopting this technology. High-value crops like tomatoes, cucumber, and capsicum are grown by the farmers of NICRA village. Three types of poly-houses viz. Z-shape of sizes 40 square meters, 100 square meters, and 250 square meters are recommended for NICRA village. The area under protected cultivation is increased from 0.3 ha in 2016 to 1.8 ha in 2021 and the yield in the case of capsicum is increased from 32.0 quintals in 2016 to 641 quintals per annum from all structures in 2021. Initially, the Indra variety was introduced in the NICRA village that's the green one, and later on, hybrids varieties of capsicum are introduced by farmers themselves to improve the socio-economic status of farmers of NICRA village. Six progressive farmers of NICRA village now started growing coloured capsicum and cherry tomato under poly-houses. They are selling it at the rate of rupees 90-120 at Lagga to a Delhi-based firm.

CONSERVATION OF GENE POOL OF TRADITIONAL MANGO (*MANGIFERA INDICA* L) CULTIVARS OF SOUTH KERALA FOR CLIMATE RESILIENT FARMING

***Bindu B, Renjan B and Anis Joseph R**

Farming Systems Research Station, Sadanandapuram
Kerala Agricultural University
E-mail : bindu.b@kau.in

ABSTRACT

Mango, the king of fruits is one of the major fruits of Kerala. Flowering and fruiting in mango is highly correlated with change in climatic conditions. Many traditional mango cultivars are seemed to resist the change in climatic situations also. Most of them are in the verge of extinction. There is an urgent need to conserve these traditional mango varieties. Hence, this work was conducted with an objective of conducting survey in South Kerala for locating traditional mango varieties and for identification of native cultivars which are giving higher yield, fruit quality, pest and disease resistance even under changing climatic scenario of Kerala, categorization of the identified traditional varieties and evaluation of these cultivars using morphological markers and finally conservation of gene pool of selected traditional cultivars. For this random survey was conducted to locate the indigenous/native mango varieties in different parts of Kollam, Thiruvananthapuram, Pathanamthitta and Alappuzha districts. The selected traditional mango varieties identified in the farmers field were categorized based on the utility of fruits in to pickling, table and juicy types. The selected traditional mangoes were characterized based on morphological markers. 81 numbers of elite traditional mango trees were identified during the study.

DEMONSTRATION OF SHORT DURATION RICE (*ORYZA SATIVA*) VARIETY PUSA BASMATI 1509 AS A STRATEGY TO COPE WITH CLIMATE CHANGE IN BUNDELKHAND

Anil Kumar Singh, R.K.S.Tomar, Rajeev Chauhan and Rahul Ojha

Krishi Vigyan Kendra, Datia (M.P.)
E-mail : aksingh_kvk@rediffmail.com

ABSTRACT

Krishi Vigyan Kendra, Datia, Madhya Pradesh conducted 100 demonstrations in 40 ha. on rice with varieties Pusa Basmati 1509 for five consecutive years from 2017 to 2021 at farmers' fields of village Kharag, Sanora, Barodi and Rajpur village in Datia district under NICRA project to find out the worth of this verity. The component demonstration of frontline technology in paddy was comprised of improved short duration variety PB 1509, Proper tillage, proper seed rate, sowing method, balance dose of fertilizer (100:50:50 NPK kg/ha), weed management and protection measures. Statistical tool like percentages was used in this study to analyze data. The technology gap, extension gap and technology index were calculated by using stabilised formulas. The results of five years of studies revealed that the yield under demonstration plots was 4508 kg/ha as compared to 3919 kg/ha in traditional farmer practices plots. This additional yield of 588.80 kg/ha and the increase in average rice productivity by 15.03 per cent may contribute to the present rice requirement on a national basis. The average technology gap, extension gap and technology index were found to be 292.00 kg/ha, 588.80.00 kg/ha and 6.08 per cent respectively. An additional net return of Rs. 6337 was received from this variety which is 11.00 per cent more to the farmer's practices. Fluctuating the sale price (Mandi rate) of rice during all years influenced the economic returns per unit area. Adoption of the improved package of practices in rice cultivation recorded a higher B:C ratio (2.51) as compared to farmers' practices (2.32). Yield enhancement and higher net returns were observed under FLDs of this improved variety of rice. Thus, the productivity of rice could be increased with the adoption of an improved variety. The present study resulted to convincing the farming community of higher productivity and returns. There has been a significant change in the income of farmers owing to the adoption of paddy cultivation with variety P B 1509 through mechanisation. Both from the viewpoint of crop intensification drive as well as climate change, there is a need to have rice varieties that could mature early without much penalty on yield. Rice reduction in Bundelkhand is largely rain fed and with increased frequencies of weather extremes, the use of short maturity varieties should be emphasized and promoted. Growing short duration varieties of rice has other advantages like fitting other crops in between. It has been reported that the adoption of short duration rice varieties is one of the strategies to mitigate the emission of methane and nitrous oxide which are greenhouse gases. Since, the rice crop is said to be one of the major contributing factors to global warming, growing short duration varieties is one way of reducing such emissions.

ECONOMIC EVALUATION OF TECHNOLOGY FOR PROMOTING ORGANIC TURMERIC PRODUCTION IN MUZAFFARPUR DISTRICT OF BIHAR, INDIA

***Nidhi Kumari, M. L. Meena, Arpita Nalia and M.S. Kundu**

Krishi Vigyan Kendra, Muzaffarpur (Bihar)-843121
DR. Rajendra Prasad Central Agricultural University Pusa (Bihar)-848125
*Email:ntiwari.hjp@gmail.com

ABSTRACT

The spices constitute an important group of agricultural commodities, playing an important role in our national economy. The export of spices together accounts for 29.36% in volume and 19.20% in value of total export of spices. This study was conducted during the year 2020-21. A total of 120 farmers from different categories were selected purposively from adopted eight villages of Muzaffarpur district of Bihar for conducting Front Line Demonstrations (FLDs) on the farmers' field. Materials for the present study comprised of five high yielding turmeric varieties *viz.,* Rajendra Sonia, Rajendra Sonali, Keshari, Roma and BSR 1 with the recommended package of practices. The results of the study showed that under diversified agro-climatic conditions, three varieties of turmeric *viz.,* Rajendra Sonia, Rajendra Sonali and Keshari have given encouraging results over local check and have potential to perform well with timely management practices in arid condition of Rajasthan. Highest net return was obtained from the energized Rajendra Sonia variety Rs. 2,85,700/ha followed by Rajendra Sonali (Rs.2,78,955/ha) and Local turmeric (Rs.1,97,380/ha). In terms of benefit-cost ratio, the variety Rajendra Sonia ranked first (3.9) followed by Rajendra Sonali (2.8) and Local check (1.8), respectively. These varieties may be popularized with full package of practices to explore the potential in field conditions and mitigate the extension gap simultaneously efforts need to be made to reduce the large technology gap described in this paper. In economic view, an additional cost mainly for inputs was increased slightly in FLDs over local check. However, it was recovered by increasing gross and net return substantially and resulted in more benefits cost ratio than the local check. The use of latest production technologies with timely systematic management would increase productivity of turmeric and income of the small and margin by farmers who are mainly associated with this crop.

EFFECT OF FRONT LINE EMONSTRATION ON FOLIAR APPLICATION OF WATER SOLUBLE FERTILIZER IN CAULIFLOWER IN BALODABAZA- BHATAPARA DISTRICT OF CHHATTISGARH.

Savita Rajput, A.S. Rajput, S. Panday

Krishi Vigyan Kendra, Bhatapara (C.G.)
Email:sanumanu3976@gmail.com

ABSTRACT

The present investigation was undertaken during rabi season 2019-20 to study the efficiency of foliar application of water soluble fertilizers to enhance growth, yield and quantity of cauliflower (*Brassica oleracea* L.) var. botrytis. Field experiment was conducted at farmers field in village – Gurra, Godhi S, Gudeliya and Tarenga. Foliar application of water soluble fertilizers is creating great attention along with improved package of practices. Cauliflower is a heavy feeder and it requires large amount of macronutrients as well as micronutrients for better development of curd and its quality . The average curd weight was found significantly higher in treatment of application of 75% RDF (120:80:60) and foliar spray of fertilizer (19:19:19)@ 10 gm per liter water at 25 and 40 DAT. The results reveal that the higher yield 655 qt/ha obtained in recommended treatment as compared to farmers practices 475 qt/ha. The average curd weight was found 701g under recommended and 575g under farmer practice. The net return Rs. 366500 / ha and 253625, B.C. Ratio 4.89 and 3.77 were found under recommended treatment and farmers practice respectively . cauliflower is the most popular winter vegetable among cole crops . The foliar application of water soluble fertilizers with improved package of practices might be helped to increase the productivity of cauliflower.

EFFECT OF MECHANIZED TRANSPLANTING ON YIELD, YIELD ATTRIBUTES AND ECONOMICS OF RICE *(Oryza sativa*(L)*)*

J Vijay, N Venkateshwar Rao and G Prabhakar

Krishi Vigyan Kendra, Jammikunta, Karimnagar 505122 (Telangana)
Email: vijayjakkula86@gmail.com

ABSTRACT

Conventional rice transplanting methods are laboured exhaustive and involves drudgery. On an average only transplanting operation takes one fourth of the total labour requirement of rice production under traditional system. Shifting of agricultural labourer towards urban areas for better remuneration creates labour shortage during peak time of transplanting. Under such circumstances, an affordable and flexible way of rice transplanting without compromising grain yield is the need of the time. In this context, Thirty Front line demonstrations were conducted by Krishi Vigyan Kendra, Jammikunta from 2018-19 to 2020-21 to demonstrate mechanically transplanted rice cultivation in a few areas of Karimnagar district using a self-propelled walk behind six-row mechanical transplanter.

The field capacity of rice transplanter was 0.20 ha per hour and time taken to cover one hectare area was 5 hours and 10 minutes. Results of the trials indicated that the yield parameters viz., number of productive tillers/hill, panicle length, number of grains/panicle and yield were higher in mechanized transplanting than manual transplanting. Mechanized transplanting recorded more grain yield (7048 kg/ha) and net returns (Rs. 95106/-) with less cost of cultivation (Rs.41508/-) compared to manual transplanting. Mechanized transplanting recorded benefit cost ratio of 3.32, but it was 2.77 in case of manual transplanting. Mechanized transplanting with rice transplanter can be used successfully as an economic, viable and alternative option for obtaining higher yield and reducing cost of cultivation as the manual transplanting involves more labour and drudgery.

B9

IMPACT OF FRONT LINE DEMONSTRATION OF CHICKPEA UNDER RICE FALLOW IN MANIPUR

N. Anando Singh[1] and Sakhen Sorokhaibam[2]

College of Agriculture,
AICRP on Chickpea, Central Agricultural University, Imphal-795004
E-mail : anandosingh@gmail.com

ABSTRACT

One hundred and twelve front line demonstrations of chickpea were conducted during 2013-14 to 2018-19 under rainfed rice fallow land conditions in six different districts viz. Imphal East, Imphal West, Thoubal, Churandpur, Chandel and Bishnupur of Manipur. The productivity and economic returns of chickpea in improved full package practices were calculated and compared with the corresponding farmer's practices (local check). Improved full package practices recorded higher yield as compared to farmer's practices. On an average the improved technology (12.5 q/ha) had higher yield to the tune of 3.6 q/ha than the farmer's practices (8.9 q/ha). In spite of yield advantages, the technology gap, and extension gap existed. The improved technology gave higher gross return (E 66,787/ha**),** net return (E 42,393/ha) with higher cost benefit ratio (2.7) as compared to farmer's practices. By adopting improved full package production technologies, productivity of chickpea can be increased which will further uplift in the socio-economic level of the rice based farming communities.

B10

IMPACT OF FRONT LINE DEMONSTRATION ON TURMERIC IN BALODABAZA- BHATAPARA DISTRICT OF CHHATTISGARH.

Savita Rajput, A.S. Rajput, S. Panday

Krishi Vigyan Kendra, Bhatapara (C.G.)
Email:sanumanu3976@gmail.com

ABSTRACT

A front line demonstration was conducted at eight farmers field in Balodabaza- Bhatapara district of Chhattisgarh during kharif season 2019-20 to demonstrate the improved package of practices of Turmeric (Curcuma longa) . There were two treatment in which one was turmeric cultivation with traditional practices while in another recommended practices adopting full package of practices. The result revealed that traditional practices gave a yield of 185q/ha while turmeric cultivation with full package of practices gave a yield of 302 q/ha which showed that adopting full package of practices there was 63.24 % increasing in yield . The Rhizome weight per plant recorded to be183 gm in traditional practices against 229 g in full package of practices. Similarly net return was also calculated which showed that traditional practices gave a net income of 190000 Rs / ha with B : C ratio of 2.0 against a net income of 354000 Rs/ ha with with B : C ratio of 2.40 in demonstration field.

IMPACT OF ZERO-TILLAGE WHEAT ENHANCING STABLE YIELD AND ECONOMIC BENEFITS UNDER DIVERSE GROWING SEASON CLIMATES IN THE MUZAFFARPUR DISTRICT OF BIHAR, INDIA

***M.L. Meena, Nidhi Kumari, Arpita Nalia & M.S. Kundu**

Krishi Vigyan Kendra, Turki-Muzaffarpur (Bihar) 843 121
Dr. Rajendra Prasad Central Agricultural University, Pusa (Bihar) 848 125
*Email:mlmeenacazri@gmail.com

ABSTRACT

The present study aims to determine the adaptation and impact of zero tillage technology for wheat cultivation in Muzaffarpur district of Bihar. ZT technology is well known in the form of Conservation Agriculture (CA) that involves continuous minimum mechanical soil disturbance, permanent organic soil cover with crop residues or cover crops and diversified, efficient and economically viable crop rotations provide opportunities for saving on inputs, improving resource use efficiency and mitigating greenhouse gas (GHG) emission and climate change adaptation. Under the Climate Resilient Project, an attempt was made to introduce ZT technology among two adopted villages under Bandra block of Muzaffarpur district in Bihar, India. The result has shown that ZT is gaining popularity amongst the farmers in the adopted villages for establishing wheat crop for higher income and sustainability of the farming community. This technology allows rice-wheat farmers for direct drilling of wheat sooner after rice harvest without any preparatory tillage, so that wheat crop heads and fills grain before the onset of pre-monsoon. This involves sowing with a specially-designed zero-till seed-cum-fertilizer drill/planter, which has inverted 'T' type furrow opener to make a narrow slit in the soil for placing seed and fertilizer. Wheat was sown by zero tillage technology that helped in advancing sowing time, reduced cost of cultivation in terms of land preparation (Rs. 5000/ha), saving in labours time (6-7 hr/ha), fuel (50 lt/ha), environmental pollution (65%) as well as water-saving (40%).

INTENSIFICATION OF PROTECTED CULTIVATION INVITED NEW BIOTIC STRESSES UNDER MID HILLS OF HIMACHAL PRADESH

Pankaj Sood*, Ajay Sood, DS Yadav, LK Sharma, Shakuntla Rahi and Kavita Sharma

CSKHPKV, Krishi Vigyan Kendra, Mandi Himachal Pradesh-175019, India
E-mail : pankajplp@rediffmail.com

ABSTRACT

Farming on small and marginal farms by the resource poor farmers in hilly areas is not remunerative enough to earn them secured livelihood due to poor crop management and climatic adversities. Crops especially vegetables are more prone to insect-pests as compared to other crops under protected cultivation due to their tenderness & softness, congenial environmental conditions, unlimited food supply, multiple pest generations and lack of natural enemies. With adoption of this technology across the regions in state and climate change during last one decade, many new pests have started invading the crops and causing severe losses. Data pertaining to pest incidence during 2011 revealed that lepidopteran caterpillar (*Helicoverpa armigera*), green house whitefly (*Trialeurodes vaporariorum),* aphid (*Myzus persicae),* vegetable mite (*Tetranychus* spp.) in tomato; *H. armigera*, *T. vaporariorum, M. persicae, Tetranychus* spp. in capsicum and serpentine leaf miner (*Liriomyza trifolii*), *M. persicae, Meloidogyne* spp. & *Tetranychus spp*. in cucumber were observed to be the major pests. However the surveys under protected conditions during 2021 revealed that tomato pinworm (*Tuta absoluta*), lepidopteran caterpillar (*Spodoptera litura*), root knot nematode (*Meloidogyne* spp.) apart from sucking pests viz. whitefly (*Trialeurodes vaporariorum),* aphid (*Myzus persicae),* vegetable mite (*Tetranychus* spp.) were more severe in tomato. *Tuta absoluta* in particular resulted in complete failure of tomato crop under protected conditions. Likewise, thrips (Thrips spp.), russet mite, yellow mite (*Polyphagotarsonemus latus*), whiteflies (*T. vaporariorum*)*, aphid* (*M. persicae*)*,* spider mite (*Tetranychus* spp. tobacco caterpillar (*Spodoptera litura*) in capsicum and serpentine leaf miner (*Liriomyza trifolii*), aphid (*M. persicae*)*,* Root knot nematode (*Meloidogyne* spp.) & spider mite (*Tetranychus spp*.) in cucumber have acquired the status of major pests with passage of time. Also the severity of incidence of some pest species was very high during 2021 compared to 2011. Research efforts are, henceforth needed for effective management of new species for further upscaling this technology.

ONION VARIETY BHIMA SUPER ENHANCES PROFITABILITY OF ONION GROWERS

Airadevi P. Angadi, Sudha S., M. R. Kammar, DineshKumar S. P., Venkanna B., and S. C. Angadi

ICAR-KVK, Bagalkot-587101,
University of Agricultural Sciences, Dharwad, Karnataka, India
Email: abhayaa9@gmail.com

ABSTRACT

The front line demonstrations (FLD's) on Bhima Super of onion were conducted by ICAR-Krishi Vigan Kendra of Bagalkot, Karnataka. Bhima Super is a new red onion variety with big bulb size developed by Directorate of Onion and Garlic Research, Rajgurunagar, Maharashtra which has been identified for release for *kharif* and late kharif season. Improved crop management practices were demonstrated in farmer's field for three consecutive years 3 years during *kharif* season from 2016-17, 2017-18 and 2018-19 to check the performance of Bhima Super over local variety. As an outcome of FLD, it was noticed that the demo variety (Bhima Super) recorded average yield of 19.56 t/ha with net return of Rs. 93266.6 as compared to farmers practice, which produced average yield of 16.23 t/ha with net return of Rs. 60958.3. Timely plant protection measures reduced the average bulb rotting incidence (11.8%) in Bhima super compared to local check (21.8%), average thrips incidence was also low in Bhima super (13.5 thrips no./plant) and in local check (19.90 thrips no./plant). There was less incidence of purple blotch disease (21.9%) but disease incidence was high in local variety (29.23%). The other parameters like extension gap, Technology gap and Technology index were derived for the assessment of technology adoption rate. The average extension gap, Technology gap and Technology index were 5.67, 2.53 and 11.50 per cent respectively. The average Benefit cost ratio was high in Bhima Super onion (3.12) compared to local variety (2.35). On an average 19.4% yield increase was observe in demo plots over farmers practice. The results clearly showed the positive impact of front line demonstrations over farmer practice towards increasing the productivity of onion in Bagalkote district of Karnataka. Demonstrated technology proved more remunerative and economically feasible to the onion growers than their conventional methods.

POPULARIZATION OF CLIMATE RESILIENT SALI RICE VARIETIES AMONG THE FARMERS IN MORIGAON DISTRICT OF ASSAM.

Shaptadvipa Bhattacharjee, Rijusmita Sarma Deka And Prasanna Kr.Pathak

KVK, Morigaon (Assam)
E-mail : kvkmorigaon@gmail.com

ABSTRACT

Assam is the land of agriculturally rich heritage which is divided into six agro-climatic zones. Out of the six agro climatic zones Morigaon district falls under Central Brahmaputra Valley Zone which receives an average annual rainfall of 1770mm of which monsoon contribution is 83%. Monocropping is mainly practiced in the majority of the areas. Boro rice is the predominant crop of the district followed by rabi vegetables/crops. During Kharif season due to heavy rainfall rice as a commercial crop has lost its popularity in the years. Mostly long duration local varieties are being practice by the farmers and only 10-15 percent area is devoted to high yielding varieties, for which the productivity becomes low. Therefore, it has now become utmost important that farmers get benefitted by submergence tolerant sali paddy varieties so that they can go for their Rabi crops at proper time. With the intervention of KVK, Morigaon for popularizing the submergence tolerance varieties initially in the year 2016-17 OFT was conducted covering an area of 0.53 ha to evaluate the performance of the varieties in the district. Despite of heavy rain during that growing period an average yield of 5.1 tonn was obtained by conducting OFT. Than with success of OFT Frontline Demonstration on Ranjit Sub-1 and Bahadur Sub-1 was conducted for three years covering an area of 6.48 ha area which was later spread to 500 ha area under APART project as well as farmers own interest. Later in the year 2020-21 foundation seed production of Ranjit Sub-1 covering 1 ha area was conducted which expanded to 20 ha area. Farmers of the district showed a positive response for adoption of submergence tolerance varieties and one of the Farmer Producer Company named POOHAR adopted seed production of submergence tolerant varieties as one of the main agenda for their sustainability as FPC. The POOHAR group has registered seed production programme of Submergence tolerant varieties under Assam State Seed and Organic Certification Agency an area of 30ha in the year 2022-23.

PRODUCTIVITY AND PROFITABILITY ANALYSIS OF LATE SOWN WHEAT (CV. RAJ. 4238) UNDER PADDY-WHEAT CROPPING SYSTEM AT FARMERS' FIELDS

R.K. Bairwa*, Roop Singh, Kamla Mahajani[1], Gunjan Sandhya and Sarita

Krishi Vigyan Kendra, Kota-324001 (Raj.)
[1]Krishi Vigyan Kendra, Bundi-323001 (Raj.)
Email: rb_agro@rediffmail.com

ABSTRACT

The study was carried out during Rabi 2015-16 to 2019-20 at farmer's fields in the adopted villages of Bundi district of Rajasthan. Frontline demonstrations were conducted in an area of 75.2 ha with active participation of 188 farmers with the objectives to analyse the productivity and profitability of late sown wheat under paddy-wheat cropping system. The results revealed that frontline demonstrations recorded higher grain yield of wheat as compared to farmer's practices over the years of study. Improved variety (Raj 4238) of wheat resulted in progressively increased grain yield from 43.44 to 51.46 q/ha with a range of 6.41 to 12.97 per cent higher over farmers practices during five years of study. In addition to increase in grain yield of wheat, mean of extension gap, technology gap and technology index were found 3.94, 5.92 q/ha and 10.76 per cent, respectively. The extension gap may be reduced by popularization of improved packages and practices of wheat in late sown condition under paddy-wheat cropping system. Improved variety (Raj 4238) of wheat under late sown condition also gave higher gross and net return with more benefit cost ratio as compare to farmer's practices over the years of study and on mean basis. The study was also revealed that variety Raj 4238 was found feasible in late sown conditions under paddy-wheat cropping system in Bundi district of Rajasthan.

PROMOTION OF ALTERNATE SEERAGASAMBA RICE VARIETY VGD 1 THROUGH FRONTLINE DEMONSTRATIONS IN TIRUCHIRAPPALLI DISTRICT OF TAMIL NADU

Noorjehan A.K.A.Hanif[1], V.Dhanushkodi[2], Dr.V. Alex Albert[3] and G.Balasubramanian[4]

Tamil Nadu Agricultural University
1 & 4 – Agricultural College & Research Institute, Karur (TNAU)
2 & 3 - ICAR Krishi Vigyan Kendra, (TNAU), Sirugamani, - 639 115, Tiruchirappalli district,
Email: noorjehan@tnau.ac.in

ABSTRACT

Traditional Seeragasamba rice varieties were grown in cluster of villages (45 ha) in Thuraiyur taluk of Tiruchirappalli District are low yielding. Through Krishi Vigyan Kendra (KVK) backstopping, paddy VGD 1 in farmers land was taken up at Koppu village and a demonstration plot at KVK farm during Samba season 2019 to showcase the results to the farmers visiting KVK and trainees were highly satisfied with the performance of paddy VGD 1. Hence KVK intervened to promote the new VGD 1 variety through frontline demonstrations in ten locations in two doubling farmers income (DFI) villages of KVK Nettavelampatti and Sevanthalingapuram and three locations in S.Pudukkottai village in Samba season 2020. Through KVK interventions like conduct of trainings to farmers (6 no.s), field days (2 no.s), focus group meetings and method demonstrations on seedling treatment, seedling nipping and print media to popularize this Variety. The study revealed that yield increase of 57% was recorded for paddy VGD1 variety (54.65 q/ha) than local Seeragasamba variety (34.75 q/ha). Non-lodging short stature type (29.5 %), with more number of tillers (57.2%) over the local variety along with less or no pests and disease attack. Further recorded net returns of Rs. 76585 per ha in VGD 1 (BCR 2.56) than local Seeragasamba variety for Rs. 32705 per ha (BCR 1.69). Farmers' preference was good with paddy variety VGD 1 fetched good market price on par with local Seeragasamba variety and farmers were distributed themselves their produced seeds for area expansion of paddy VGD 1 and through Andanallur Farmers Producer Organization has planned for about 1000 acres of VGD 1 cultivation for samba 2021 season and at present this variety has reached many of the rice growing districts of Tamil Nadu.

PROMOTION OF LOW COST VERMICOMPOST PRODUCTION FOR LIVELIHOOD IMPROVEMENT IN MORIGAON DISTRICT OF ASSAM

Saurav Baruah, Rijusmita Sarma Deka, Sukanya Gogoi, Prasanna Kumar Pathak*

Krishi Vigyan Kendra, Morigaon, Assam Agricultural University
*Director of Extension Education, Assam Agricultural University, Jorhat
E-mail : kvkmorigaon@gmail.com

ABSTRACT

Abstract: Contribution of Indian women in country's GDP is 18%. Women played a major role in Indian agriculture. Empowering women through developing their skill in various income generating activities of agriculture and allied sector would play a significant role in uplifting the rural economy. An enterprise involved in Vermicompost production with locally available material is now emerging as an income generating avenue for farm women. Vermicompost, also known as Black Gold, is produced by the activity of earthworm on partially decomposed organic material. The compost is very much rich in essential plant nutrients, beneficial soil microorganisms, plant growth promoting substances, vitamins and enzymes. During the vermicomposting process, coelomic fluid of the earthworm is also released which is known as vermiwash. The wash is rich in essential plant nutrients, plant hormones, vitamins and also has bio-pesticidal properties. Now-a-days due to the growing concern on human health, demand for organically grown crops has increased. Growers are also aware about the negative impact of chemical fertilizers on soil health. This results in huge demand of organic inputs in crop production. Hence, there is a tremendous scope for establishment of a small scale industry at community level involving farm women for production of vermicompost. In this aspect, Krishi Vigyan Kendra Morigaon conducted Front Line Demonstration (FLD) on Low Cost Vermicompost production involving ten numbers of farm women with an aim of wide scale adoption of the technology among others for upliftment of socio-economic standard of the rural people. Prior to the demonstration programme, training on low cost vermicomposting was provided to them. In the FLD programme, the technology demonstrated was pit method of vermicompost preparation in a tank of size 2.5 m(L) X 0.91 m (B) X 0.91 m(D) using locally available materials such as bamboo and polythene sheet. Vermiwash was collected in an earthen pit of size 0.31 m (L) x 0.31 m (B) x 0.31 m (D) by connecting the pit with vermicomposting unit by a PVC pipe (All India Coordinated Research Project for Dryland Agriculture, Biswanath College of Agriculture, AAU, 2015). Time required to produce vermicompost was 2.5 to 3 months in summer season and 3 to 3.5 months in winter season. On an average vermicompost can be harvested 3 times from one tank in one year from the units. In the present study, on an average 23.88 quintals of vermicompost and 156 liter of vermiwash was harvested from each tank in a year. In addition, 7.2 kg of earthworm was also produced from a tank in a year which was also marketed. While calculating the economics of the demonstration programme, it was found that on an average net income of Rs 26,045.00 per tank per year was recorded with a B:C ratio of 2.50. Thus, the present study reveals that a profitable return can be obtained by recycling of farm waste through vermicomposting which shows possibilities of setting up an enterprise at community level involving farm women.

ROLE OF CLIMATE SMART AGRICULTURAL PRACTICES IN ADOPTION OF ZERO TILLAGE IN RICE-WHEAT CROPPING SYSTEMS IN MUZAFFARPUR DISTRICT OF BIHAR, INDIA

***M.L. Meena, Ipsita Biswas, Nidhi Kumari, Arpita Nalia and B.C. Anu**

Krishi Vigyan Kendra, Turki, Muzaffarpur (Bihar) 843121
*Email:mlmeenacazri@gmail.com

ABSTRACT

Zero tillage is defined as planting crops in previously unprepared soil by opening narrow slots or trenches of the smallest width and depth needed for proper coverage of the seed. At least 33.5 per cent of the soil surface remains covered with crop residue. Zero tillage is, in a way, a complete farm management system that should include many agricultural practices, including planting, plant residue management, weed and pest control, harvesting, and crop rotations. Diffusion and benefits of ZT in Bihar work on ZT in Muzaffarpur district started as early as in the 2012 by, but it was not successful due to technical difficulties, such as lack of adequate planting equipment and difficulty in chemically controlling the weeds. It restarted in 2020 with introduction of inverted ZT openers by the Climate Resilient Agriculture Project (CRAP) started by Govt. of Bihar. In 2020-21 a prototype was developed at Dr. Rajendra Prasad Central Agricultural University, Pusa. After many refinements and adaptation of ZT machine in 2020, about 50 ZT drill machines were supplied to farmers and KVK, Turki. This was done to better understand the problems in machine operations. The combined efforts of CRAP project, Rice-Wheat Consortium for Indo-Gangetic Plains and KVK, Turki resulted in wide spread adoption of ZT after the turn of the century. It is estimated that approximately 540 hectare area is under ZT and reduced tillage in Muzaffarpur district (RWC 2020), covering district of all blocks and the impact of ZT was 54.6%, adoption of ZT in rice-wheat cropping system 59.4%, respectively. The results confirm the trend of slowing down of productivity growth of rice and wheat in Muzaffarpur for adoption of ZT in rice wheat cropping system. The rate of varietal improvement and notification has increased for both the crops, but there is varietal concentration in both the crops. The zero tillage in wheat and crop variety improvement is the major technological interventions in the systems, which have generated the returns to the order of 89.5% in 2021. The estimated IRR is 41.4% and the ratio of net benefits to the cost is 2.9 in zero tillage rice-wheat cropping system.

ROLE OF CLIMATE-SMART AGRICULTURAL PRACTICES FOR ENHANCEMENT OF ECONOMIC BENEFITS TO SMALLHOLDERS IN MUZAFFARPUR DISTRICT OF BIHAR, INDIA

***M.L. Meena, Nidhi Kumari, B.C. Anu and Arpita Nalia**

Krishi Vigyan Kendra Turki, Muzaffarpur (Bihar)-843121
Dr. Rajendra Prasad Central Agricultural University, Pusa (Bihar)-848125
*Email:mlmeenacazri@gmail.com

ABSTRACT

Small landholders can implement a range of climate smart agricultural (CSA) practices and technologies, in order to minimize the adverse effects of climate change and variability, but their adoption largely depends on economic benefits associated with the practices. To demonstrate the potential economic benefits of CSA practices, a study was conducted with smallholder farmers in the Muzaffarpur district of Bihar, India. The results show that the study about 60% of survey households implement at least one CSA practice/ technology in their farm. Majority of the CSA adopters prefer to use improved crop varieties (85.3%), laser land levelling (39.5%), crop rotations (47.2%) and zero tillage practice (27.8%). The improved crop varieties which are tolerant to severe floods, droughts and pest/diseases, use nutrients and water efficiently and can adjust to climate change and variability. These varieties can be sown in different planting dates in a cropping season to adjust with changing monsoon time and temperatures. Laser land levelling and zero tillage could be water saving technologies for water deficient areas. For example, laser land levelling, by making the field well levelled, enhances water use efficiency compared to unlevelled fields. Similarly, zero tillage with residue retention conserves soil moisture, reducing evaporative loss of moisture thus requiring less water than conventionally tilled fields. The average cost of adoption were 1650, 3350 and 1580 INR ha^{-1} for the use of improved crop varieties, laser land levelling and zero tillage respectively. Results show that farmers can increase net return of INR 21675,712 ha^{-1} yr^{-1} with improved crop varieties, INR 8350 ha^{-1} yr^{-1} with laser levelling and INR 7275 ha^{-1} yr^{-1} with zero tillage in rice–wheat system. Results also show that the combination of improved seeds with zero tillage and laser land levelling technologies can further improve crop yields as well as net returns.

B20

STUDY ON EFFECTIVENESS OF 'ARKA MANGO SPECIAL' FOR HIGHER YIELD AND QUALITY OF MANGO VARIETY 'KESHAR' IN RED LOAM SOILS OF BIDAR

Ningdalli mallikarjun ,Sunilkumar N.M, Akshay Kumar and Rakesh Varma

ICAR- Krishi Vigyan Kendra, Bidar-585402, Karnataka (India)
Email: nmalluhorti@gmail.com

ABSTRACT

A front line demonstration was conducted at in the farmers field of Bidar district by ICAR- Krishi Vigyan Kendra, Bidar Karnataka , India during 2018 to 2021 to study the response of mango variety 'Keshar and Dasheri ' to 'Arka Mango Special', a foliar micronutrient formulation developed by IIHR, Bengaluru for higher and quality yields in mango. The demonstration was carried out in 15 farmer's field in an one acre of orchard a randomized block design with four treatments, viz., T1: control (sprayed with normal water), T2: Arka Mango Special @ 0.5% .Treatments were foliar sprayed four times at before flowering, flower bud differentiation, flower initiation and marble stage of fruit growth.

All the three micronutrient treatments significantly improved fruit retention, yield and two important fruit quality parameters over the control. The treatment Arka Mango Special recorded the maximum values for no. of fruits/panicle at pea stage, no. of fruits/tree and fruit yield was higher respectively.

B21

SWEET CORN: A BETTER CHOICE IN RAINFED CONDITION OF WEST NIMAR FOR TRIBAL FARMERS

Anita Shukla [1], G.S. Kulmi [2], Y.K. Jain [3] and Santosh Patel [4]

RVSKVV- Krishi Vigyan Kendra, Khgargone 451001 (M.P.)
Email: zars_kgn@rediffmail.com

ABSTRACT

West Nimar is traditionally Cotton – Jowar Zone since ages but during the long span of time Soybean and Wheat have become important crops. However due to falling productivities of soybean and cotton and various problems of insect pests, farmers are looking for some better choice. To find an appropriate crop, KVK, Khargone laid out demonstrations on sweet corn at Nutrismart Villages for three years. Sweet Corn has huge potential to boost income of small and marginal farmers and may occupy an important acreage in coming years. Sweet Corn shall be helpful in mitigating problem of malnutrition in the tribal region. Results of three year demonstrations indicated that Sweet corn gave dry cob yield of 67q/ha with net profit of Rs. 109860/- B: C ratio of 5.39 over local Maize. Nutritive values in Sweet corn were 87 K Cal /100 gm, Carbohydrate 18.60 gm/100 gm, Protein 3.28 gm/100 gm, Fat 1.33 gm/100 gm and Dietary fiber 2 gm/100 gm of Sweet corn.

B22

STUDY ON SOCIO-ECONOMIC CONDITION OF FARMERS CULTIVATING MAKHANA AT KATIHAR DISTRICT OF BIHAR

Nandita Kumari and Kamini Kumud

KVK, Katihar
Email; nanditakvk@gmail.com

ABSTRACT

In India, the cultivation of makhana is distributed in Bihar,West Bengal,Assam, Tripura,Manipur, Orisha, Madhya Pradesh,Uttar Pradesh,India is the only country where makhana is cultivated as cropand mainly in the state of Bihar and some part of Aasam. In Bihar area under makhana cultivation is about 13000 hectare and accounts to a total yield o 85 percent of the total production in India. Major makhana producing district in Bihar include Darbhanga,Sitamarhi,Madhubani,Sahrsa,Supaul Araria,Kishanganj Purnea and Katihar. It is a cash crop and is marketed in the form of popped makhana commonly known as makhana lawa.It is commonly known as gorgon nut or fox nut and grown in stagnant perennial water bodies like pond,lakes and swamps. Cultivation of makhana is highly cumbersome labour intensive and involves human drudgery while sweeping bottom of water body for seed collection is followed by processing of raw seeds which is mainly painstaking activity. Fisherman community(Mallah) belonging to the weaker section of society, is mainly involve in makhana cultivation and processing.

B23

UTILIZATION OF ROTO TILL DRILL IN WHEAT CULTIVATION FOR ENERGY SAVING AND TO REDUCE INPUT COST

Manoj Kumar*, K P Singh and Neha Kushwaha

ICAR-Central Institute of Agricultural Engineering, Bhopal-462 038, India
E-mail: manoj_iasri@yahoo.com

ABSTRACT

In the present study, an attempt has been made to assess benefits of roto till drill that is used in sowing of wheat without primary tillage. For this purpose, demonstrations of roto till drill was performed for sowing of wheat at farmer's field in Kachhibarkheda village, Bhopal, Madhya Pradesh. The impact of this technology has been assessed using data obtained during demonstrations at farmer's field. It was observed that grain yield was slightly lower but not significant at 5% level of significance in case of roto till drill (4313 kg/ha) as compared to conventional practices (4336 kg/ha). It was investigated that total input energy was significantly lower in roto till drill (11.69 GJ/ha) as compared to conventional farming (17.54 GJ/ha) at 5% level of significance. The results showed that energy use efficiency was higher in roto till drill (16.01) in comparison with conventional farming (10.42). The carbon emission was also lower in roto till drill (1551 kg/ha) as compared to conventional farming (1814 kg/ha) at $p < 0.05$. It can be concluded that this machinery may be useful in sowing of wheat without primary tillage. Besides this, it save input resources, time, reduce drudgery in field operation and helps in reducing environmental degradation.

B24

IMPACT OF TILLAGE PRACTICES AND SHOWING PATTERN ON YIELD OF COTTON CROP AND ITS ECONOMICS

P. S. Jayswal, N. S. Joshi and K. N. Sondarva

Krishi Vigyan Kendra, JAU, Amreli, College of Agril. Engg. and Tech., NAU, Dediapada
Email: priti.jayswal@jau.in

ABSTRACT

Krishi Vigyan Kendra, Junagadh Agricultural University, Amreli, Gujarat has conducted an field experiment under Agricultural Engineering discipline with two treatments, i) Farmers Practice – traditional sowing of cotton on flat bed and ii) University recommended practice – To prepare the field by ploughing followed by blade harrowing & planking and sow the crop on ridges (120 cm apart). Main aim was to find out effect of showing cotton on ridge on yield of cotton, bolls per plant and economics of cotton cultivation. This experiment was conducted for three years: 2017-18, 2018-19 and 2019-20. Data of this three year were taken and analyzed. Result of three year data shown that, there was 15.65% increase in yield under recommended practices. Under recommended practices 18.21 % more bolls per plant were found. Avg. net profit was 22.48% higher under recommended practices. B:C ratio was found 3.37 for recommended practices in cotton crop. These results show that ploughing followed by blade harrowing & planking and sow the crop on ridges (120 cm apart) in cotton crop is beneficial for farmers.

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EFFECT OF PLASTIC MULCH ON COTTON YIELD AND ITS ECONOMICS

P.S.Jayswal, N.S.Joshi, K.N.Sondarva

KVK, JAU, Amreli
E-mail : priti.jayswal@jau.in

ABSTRACT

Krishi Vigyan Kendra, Junagadh Agricultural University, Amreli, Gujarat has conducted an On Farm Trial under Agricultural Engineering discipline with two treatments, i) Farmers Practice - No use of mulching materials and ii) University recommended practice - Black Plastic Mulch (25 micron) under drip irrigation system. Main aim of this OFT was to find out effect of plastic mulch on yield of cotton, bolls per plant and economics of cotton cultivation. This OFT was conducted for three years: 2014-15, 2015-16 and 2016-17. Data of this three year were taken and analyzed. Result of three year data shown that, there was 28.93 % increase in yield under plastic mulch. Under plastic mulch 18.37 % more bolls per plant were found. Avg. gross return and avg. net profit was 29.01% and 33.15% higher under plastic mulch. B:C ratio was found 3.52 for plastic mulch in cotton crop. These results showed that plastic mulch in cotton crop is beneficial for farmers.

DIRECT DRY SEEDED RICE TECHNOLOGY TO TRIM DOWN THE CONSUMPTION OF WATER AND LEADS TO DOUBLING THE INCOME

B O Mallikarjuna[1], T N Devaraja[2], J Raghuraja [3] and Basavangowda M G[4], ICAR-Taralabalu

Krishi Vigyan Kendra, Davanagere 577005, Karnataka, India.
Email:mallikaveena@gmail.com

ABSTRACT

Direct Dry seeded Rice (DSR) technology in paddy introduced through ICAR-Taralabalu KVK to the tailend farmers for reduction in cost of production and increase the income. The technologies used were sowing through Seed cum fertilizers drill, Seed treatment with bio fertilizers, Weed management and application of RDF along with PP measures. The demonstration was conducted for the last 3 years (2017 and 2020) and the average results were as follows the cost of production Rs. 47378/ha and yield was 60.45 q/ha. In manual transplanted Rice (MTR), the average cost of production of Rs. 66207/ha and yield of 59.44 q/ha. In demonstration plot recorded the average net profit of Rs. 60050/ha with B:C ratio of 2.27 when compared to Rs. 39277/ha with Benefit cost ratio of 1.59 in check plot. We had conducted training for the farmers and farmwomen on the DSR and even provided the leaf lets, folders to the farmers and gave wide publicity through different medias. The net income of DSR was higher than MTR due to lower cost of production and it is due to substantial reduction in machineries (41.34%), irrigation (22.45%) and human labour (6.62%).

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AN IMPACT ASSESSMENT OF FRONT LINE DEMONSTRATIONS ON YIELD AND ECONOMICS OF LITTLE MILLET AND FOXTAIL MILLET UNDER RAINFED CONDITIONS

Sunitha N H, C.M.Kalibavi, Hanamanthappa Shrihari and Manjunatha Bhanuvally

Agricultural Extension Education Centre, Huvinahadagali
University of Agricultural Sciences, Raichur, Karnataka
Email:sunitashokap@gmail.com

ABSTRACT

Small millets are more nutritious and have a lower glycemic index than rice and wheat, but factors like lack of improved varieties, agronomical packages and practices as well as unorganized seed system are constraining production and productivity. Therefore, the present study was carried out to know the yield gaps between improved practices and farmers' practices under Front Line Demonstrations (FLDs) of little millet and foxtail millet crops under rainfed conditions of Hadagali and HB.halli taluka. A total of 50 farmers were selected for frontline demonstrations in both the Districts, of which 40 ha land was covered by high yielding little millet and foxtail millet (HN-46) varieties over the last five years. The conducted FLDs made a very positive and significant impact on grain as well as on fodder yield of finger millet that ranged from 25.65 to 31.35 per cent and 21.18 to 27.17 per cent overall increase respectively while in little millet, 36.50 to 42.17 per cent and 29.60 to 35.80 per cent overall increase in grain and fodder yield respectively was recorded during the last five years. The higher technological gap (4.33 to 7.81 qtl/ha), extension gap (4.62 to 7.15 qtl/ha) and technological index (22.26 to 39.15 %) in both the crops. The data revealed that the conducted FLDs also enhanced the farmer's income by increasing B:C ratio that ranged from 1.15 to 1.38 in both the crops. The impact of such demonstrations are quite strong as it is also visible from the fact that foxtail millet variety HN-46 has been one of the most accepted varieties by farmers of Hadagali and HB halli for the last more than ten years and has been constantly under FLD programme.

ENHANCED YIELD OF SOYBEAN THROUGH FULL PACKAGE OF PRACTICES UNDER CFLD PROGRAMME IN ASHOKNAGAR DISTRICT OF MADHYA PRADESH

H. K. Trivedi, V. K. Jain, B. S. Gupta, I. S. Mirda

RVSKVV, KrishiVigyan Kendra, Ashoknagar (M. P.)
Email:kvk.ashoknagar@rvskvv.net

ABSTRACT

Soybean is a major kharif oilseed crop grown in Ahoknagar district of Madhya Pradesh.Regular cultivation of soybean crop causes low productivity due to imbalance use of fertilizer,high infestation of insects and diseases, low organic content in soil. To overcome these problems lit is necessary to teach the farmers for complete package of practices for soybean cultivation as per their field condition based on soil test data basis. CFLD programme by the KrishiVigyan Kendra, on soybean in kharif season can solve these problems under the guidance of KVK scientists for complete technical knowledge of package of practices to the farmers by various extension activities.Krishi Vigyan Kendra Ashoknagar conducted CFLD of oilseed programme since 2016 to 2022 onwards to extent of knowledge and skill of soybean cultivation to enhance the productivity among the farmers. KVK provide recently release improved varieties of seed under CFLD programme like RVS 2001-04, JS 20-34, JS 20-29 and JS 20-69 including inoculation of Rhizobium, PSB and seed treatment with Thiram + Carboxin, proper seed rate, timely sowing, Ridge and furrow sowing method, IWM and IPM practices through enhancing the productivity of soybean crop. Extension activities liketraining, field day, Kisansangoshti, field visits under Cluster Front Line Demonstration provided opportunity of to mitigate the problem of low productivity due to heavy infestation of pest and diseases resulting higher productivity and higher gains. CFLD programme creating the interest of farmers toward soybean crop production. Produce of newly released varieties horizontally spread among the farmers of Ashoknagar district by farmers to farmer's seed chain. This is a positive impact of CFLD programme.

EVALUATION OF DIFFERENT FISHERIES BASED FARMING SYSTEM OVER TRADITIONAL RICE-WHEAT CROPPING IN DISTRICTUDHAMSINGH NAGAR OF UTTARAKHAND

Jitendra Kwatra, S.K.Sharma Ajay Prabhakarand Anil Saini

Krishi Vigyan Kendra Kashipur, Distt-Udham Singh Nagar ,Uttarakhand
E-mail : jkwatradr@gmail.com

ABSTRACT

The IFS is demarcated as the naturally integrated farming system which assimilate natural resources regulation mechanisms into farming activities to achieve secure sustainable production of high quality food and farm income, reduce sources of present environment pollutions generated by agriculture with lots of labour scarcity in the district. In today's agriculture farmers are facing lots of complications regarding drop in farm productivity, Shrinkage in net cultivable area, increasing environmental and soil pollution, growing cost of production and diminutive farm returns. Integrated farming system with fish, poultry and horticulture can play a significant role in increasing manifold production, nutrition, profits and employment opportunities of rural folk.In the district of Udhamsingh nagar**,** low farm Productivity and poor resource utilization under rice wheat farming system is being observed In order to give alternate options to farmers, KVK U.S.Nagar conducted trials located between latitude 28° 53' N and 29° 23' N and laterally extends between longitudes 78° 45' E and 80° 08' E in on average 0.2 ha ponds to assess integrated pond based production, income and employment opportunity of the rural farm households. The objectives of present study to enhance the profitability and productivity, improved livelihood and nutritional security of marginal farmers through IFS approach in order to evaluate the performance to two integrated farming system viz. Fish + poultry + Horticultural crops and Fish + poultry + Agronomical crops with traditional system of cropping (rice-wheat) at seven locations in the district Udham Singh Nagar. Results of the trial indicated that in integrated pond management, additional enterprises viz., poultry and horticulture exhibited encouraging production over traditional management. The analysis of data indicated that the Fish+poultry+ Horticultural crops integrated system recorded highest gross income of Rs.4,15,320/- with 138% increase followed by Fish+Poultry+Agronomical crops integrated system with Rs.3,69,228/- with an increased returns about 112% over traditional rice-wheat cropping system.

EVALUATION OF DIFFERENT SUBSTRATES FOR THE PRODUCTION AND ECONOMICS OF OYSTER MUSHROOM (*PLEUROTUS OSTREATUS*)

Sandeep Kumar1, Somendra Nath2, Dinesh Kumar3 and Amit Kumar Singh4

[1,3&4] Krishi Vigyan Kendra, Amihit, Jaunpur - 222001 (UP)
[2] Krishi Vigyan Kendra Sohaon, Ballia
Email: skkvkjnp@gmail.com

ABSTRACT

Oyster mushrooms (Pleurotus sp.) is one of the most commercially cultivated and useful mushrooms in the world next to white button mushroom (Agaricus bisporus) especially in Southeast Asia, India, Europe, and Africa. Oyster mushroom is a source of lovastatin and contains adequate amount of protein, iron, phosphorous, folic acid, lipid, riboflavin and thiamine. Mushroom, which is pure vegetarian food, is good for diabetic patients. It also has other medicinal properties. The oyster mushrooms can also grow on various kinds of lignocellulosic agricultural waste materials as substrate such as wheat straw, sugarcane leaf, paddy straw, maize waste and sugarcane bagasse. An attractive feature of oyster mushrooms is that they can utilize a large variety of agricultural waste products and transform the lignocelluloses biomass in to high quality food. The experiment was carried out at Krishi Vigyan Kendra, Jaunpur of eastern Uttar Pradesh, during 2019. Oyster mushrooms draw their nutritional requirement from a host substrate or from the agricultural wastes rich in lignin, cellulose and hemicellulose used for their cultivation. Nutrient content varied with the substrate which lead to varied mushroom yield. An experiment was conducted to evaluate commonly available agro – wastes viz. wheat straw, paddy straw, Sugarcane leaves, Sugarcane bagasse, stalks of maize, Stalk of pearl millet for the cultivation of oyster mushroom (*Pleurotus ostreatus*). Among tested substrates wheat straw was found more yield (710.50 g/ kg dry substrate), biological efficiency, net returns and benefit cost ratio than other treatments.

FRONTLINE DEMONSTRATIONS ON KITCHEN GARDENING: AN IMPACT ASSESSMENT

Sunitha N H, C.M.Kalibavi, Manjunatha Bhanuvally and Hanamanthappa Shrihari

Agricultural Extension Education Centre, Huvinahadagali
University of Agricultural Sciences, Raichur, Karnataka
Email: sunitashokap@gmail.com

ABSTRACT

Kitchen gardens can be grown in the empty space available at the backyard of the house or a group of women can come together, identify a common place or land and grow desired vegetables, fruits, etc. that can benefit the women and community as a whole. Vegetables are major source of vitamins, minerals, and fibers; their nutritive and medicinal values in human life are well recognized.. The present work was carried out by Agricultural Extension Education Centre, Huvinahadagali in the year of 2019-20. Two villages were selected purposively for this study. Twenty Front Line Demonstrations (FLDs) were conducted during rabi and kharif seasons in these villages. Twenty farmers/farm women in each village were supplied seasonal vegetable kit of UAHS Bagalakot as demonstration kit. The kit comprised of seeds of vegetables viz., okra, sponge gourd, bottle gourd, bitter gourd carrot, radish, spinach, coriander and methi. The objective of these FLDs were to provide them knowledge about vegetables production technology for kitchen gardens and quick access of raw vegetables for daily home consumption. Therefore the present study was designed to assess the impact of these FLDs on beneficiary's knowledge regarding vegetable cultivation. Data was collected through well-structured interview schedule on their basic profile, growing and liking pattern of the respondents and their knowledge about different vegetables demonstrated under FLDs. Results revealed that the maximum gain in knowledge (55.00%) was received in irrigation and their critical stages followed by plant protection measures (52.50%), improved varieties (52.00%) and post harvest management (48.00%). The findings concluded that frontline demonstrations are effective in increasing the knowledge level of beneficiaries and adoption of nutri gardening practices

IMPACT OF CLUSTER FRONT LINE DEMONSTRATION ON THE PRODUCTION AND PROFITABILITY OF BLACKGRAMUNDER NATIONAL FOOD SECURITY MISSION IN BISHNUPUR DISTRICT , MANIPUR

Sakhen Sorokhaibam, Brajamani Kh. N. , Anando Singh and Kh, Maipak Singh

E-mail : sakhensorokhaibam@gmail.com

ABSTRACT

Blackgram is an important legume crop and is an important source of dietary protein of Indian masses. It is widely acknowledged as super food with double the protein in wheat and three -fold that in rice. Cluster front line demonstrations of blackgram were conducted by Krishi Vigyan Kendra, Utlou, Bishnupur District (Manipur) during *kharif*season from 2016 to 2021. A total 310 front line demonstrations were conducted on blackgram in 130 ha area by the active participation of the farmers with the objective of improved technologies of blackgram production potentials. The results of the demonstrations revealed that on an average yield of blackgram under improved technology ranged from 8.0 to 9.2 q/ha with a mean of 8.65 q/ha; which was 51.7 per cent more yield as compared to farmer's practices (5.7 q/ha). The study exhibited mean extension gap of 294.2 Kg/ha, mean technology gap of 336.2 kg/ha with mean technology index of 28.02 per cent. Higher mean B: C ratio of 2.62 was obtained with improved technologies in comparison to farmers' practices (1.78). The present study resulted to convincing the farming community for higher productivity and pofitability.

IMPACT OF CLUSTER FRONT LINE DEMONSTRATION ON MUSTARD IN LALITPUR DISTRICT OF UTTAR PRADESH

N. K. Yadav, N. K. Pandey, Dinesh Tiwari, Sarita Devi, Archana Dixit and Maroof Ahmad

Krishi Vigyan Kendra, Lalitpur, Banda University of Agriculture and Technology, Banda
E-mail: nitin_agril@rediffmail.com

ABSTRACT

Mustard (*Brassica juncea*L.) is one of the most important oilseed crop of Bundelkhand region of Uttar Pradesh. Krishi Vigyan Kendra, Lalitpur conducted 135 Cluster Front Line Demonstrations (CFLDs) on mustard during 2019-20 to 2020-21. The front line demonstration (FLD) is one of the most powerful tools for transfer of technology. The critical inputs were identified in existing production technology through meetings and discussion with farmers. Prevailing farmers practices were treated as control for comparison with recommended practices. An average yield of mustard were 14.7 q/ha and 15.3 q/ha during 2019-20 and 2020-21, respectively under demonstrated technology however under farmers practices the average yield were 12.0 q/ha and 11.2 q/ha during respective years and the average yield of two year was reported 15.0 q/ha over farmers practices (11.6 q/ha). However, the per cent increases yield over farmers practices were 32.2 per cent and 26.8 per cent during 2019-20 and 2020-2021, respectively and average of per cent increases yield over farmers practices of two years was reported 29.5 per cent. Economic analysis of cluster front line demonstration on mustard revealed that total net return from recommended practices were Rs. 35882/ha and Rs. 41750/ha during 2019-20 and 2020-21, respectively. The net returns in farmers practices were Rs. 24066/ha and Rs. 27000/ha during 2019-20 and 2020-21, respectively. On the basis of average of two years, net returns from CFLD practices were Rs. 38816/ha as compared to Rs. 25533/ha in farmers practices. An average BCR were 2.95 in recommended practices as compared to 2.4 in farmers practices.

IMPACT OF CLUSTER FRONTLINE DEMONSTRATIONS ON REDAGRAM PRODUCTIVITY IN HAVERI DISTRICT OF NORTHERN KARNATAKA

Ashoka, P and Rajakumar G R

ICAR-Krishi Vigyan Kendra, Ranebennur taluk, Haveri District– 581 115, Karnataka
Email: ashokapas@gmail.com

ABSTRACT

Red gram (*CajanusCajan* L.) is an important pulse crop in India, plays a major role in augmenting the income of small and marginal farmers of Northern Karnataka. The low production of traditional varieties of red gram was a cause of concern for the farmers at large. To overcome this problem of low yield, ICAR-Krishi Vigyan Kendra in Haveri district has conducted cluster frontline demonstration in field of adopted villages. The present study was conducted by KVK, Haveri during 2021-22*kharif* season with twenty five cluster frontline demonstrations in Hunasikattiand Kamododhavillages of Haveri district. The results of demonstrations showed that cultivation of high yielding variety GRG-152 of Red gram has given yield increase of 28.92 % over local check. The technology gap ranges from 3.55 in 2021-22. This high extension gap requires urgent attention from planners, scientists, extension personnel and development departments. The technology index varies from 60.64. The changes will accelerate the adoption of newer technologies to increase the productivity of green gram in this area. There is a need to adopt multi-pronged strategy which involves enhancing green gram production through horizontal and vertical expansion and productivity improvements through better adoption of improved technology. The difference in technology gap in different years was due to better performance of recommended varieties with different interventions and more feasibility of recommended technologies during the course of study. Similarly, the technology index for all demonstrations in the study was in accordance with technology gap. Hence, there is a need to disseminate the improved technologies among the farmers with effective extension methods.

IMPACT OF FRONTLINE DEMONSTRATIONS ON WHITE FINGER MILLET IN VIJAYANAGAR DISTRICT OF KARNATAKA

Sunitha N H, C.M.Kalibavi, Manjunatha Bhanuvally and Hanamanthappa Shrihari

Agricultural Extension Education Centre, Huvinahadagali
University of Agricultural Sciences, Raichur, Karnataka
Email:sunitashokap@gmail.com

ABSTRACT

India is a major millet producing country in the world, which account to about 43.85% of world total millets production. Ragi is a one of the staple food grain of Vijayanagar district, however its productivity is reducing as the year pass by. This may be due to many reasons, important causes among them are; lack of high yielding varieties, low soil fertility, scanty and untimely rainfall, prolonged dry spells etc. thus making ragi cultivation less profitable. In order to increase the crop yields and enhance the farmer's income, development and introduction of new high yielding varieties are utmost imperative. Thus objective was to familiarization and to know the performance of new ragi variety KMR-340 released variety of UAS Bangalore. The demo was conducted in Vijayanagar district for five consecutive kharif seasons of 2017 to 2021 with total of 25 demonstrations in ten villages. The results of the demo revealed that demonstrated variety performed better than the local variety with respect to plant height, number of tillers/plant and number of fingers/plant. The grain yield increased from 18.74 to 23.39 q/ha and 19.78 to 30.50 q/ha with newly introduced ragi variety during 2017 to 2021 respectively. The benefit cost ratio increased from 1.06 to 1.14 and from 1.23 to 1.25 respectively for the five years with the introduction of new variety. The results from the experiments confirm that the demonstrated new ragi variety KMR-340 illustrated better performance and was able to increase the farmer's income.

IMPACT ON PRODUCTIVITY OF WHEAT AND ECONOMICS OF FARMERS IN MALWA PLATEAU OF MADHYA PRADESH

SK Kaushik, RP Sharma, DS Tomar and Rekha Tiwari

Krishi Vigyan Kendra-Ujjain (MP)
(Rajamata Vijayaraje Scindhia Krishi Vishwa Vidyalaya-Gwalior)
Email: Kaushik.surendra@rediffmail.com

ABSTRACT

Cereals play a pivotal role to satisfy the global food demand of growing population, particularly in developing nations where cereal-based production system is the only predominant source of nutrition and calorie intake. Wheat is a widely adaptable crop that can be grown in climates ranging from temperate to tropical and cold northern parts. Wheat is a very important crop among the world's cereal crops. India, being blessed and enriched with a diverse agro-ecological condition, ensuring food and nutrition security to a majority of the Indian population through production and steady supply particularly in the recent past, is the second largest producer of wheat worldwide. The contribution of wheat in the world's gross food production is 34%. The productivity of wheat is low because of non adoption of available technological options by the farmers. There are various technologies of wheat cultivation are available as per the different Agro-ecological zones in the country. In order to find out the technological gap in achieving the high yield in wheat cultivation the present study was conducted to disseminate the production technology of high yielding wheat variety under limited irrigations. The experimental area comprised of selected 10 villages namely; Madavada, Narsighgarh, Badagaon, Salakhedi, Surakhedi, Kulavada, Maniyavada, Kankariyachand, Bichhrod and Guradiya Gurjar of Ujjain district of Malwa plateau during rabi 2019-20. A total of 20 wheat growing farmers were selected for the study. It was observed that Farmers spent more money in the form of 30% higher seed rate as well as not awared about the limited irrigations wheat variety under technological gap. The new variety DBW-110 showed dwarf in height, early in maturity, saving one irrigation water, revealed 3.12 % higher harvest index and 10.26% saved the money of farmer by reducing cost of cultivation like improving seed rate over farmer's practice. Hence limited irrigations variety produced at par yield along with heat tolerance, increased Net income and higher B:C ratio indicated the sustainability of the technology in the wheat growing area owing to rising temperature and unavailability of more irrigation water in later stages of the wheat crop may be proved revolutionary for the area under coverage.

MINIMIZING THE GAP FOR DEMAND AND SUPPLY OF CHICKPEA SEED THROUGH CLUSTER SEED PRODUCTION PROGRAMME

V. K. Jain, H. K. Trivedi,B. S. Gupta , I. S. Mirda

RVSKVV, KrishiVigyan Kendra, Ashoknagar (M. P.)
jainv71.vk@gmail.com

ABSTRACT

Farming community of Madhya Pradesh facing the huge gap in demand and supply of Chickpea quality seed to the farmers. Studies have been conducted in Ashoknagar district for the Chickpeaseed production programme through cluster front line demonstration in 2018-2022, There was blow in 20% of Chickpea quality seed by public sector, NGO and Private sector. Chickpea is mostly affected either by Water scarcity or by Fusarium wilt, resulting loss of crop production. Old verities and nonresistant varieties of Collar rot, Root rot, Wilt and Ascochyta blight reducethe yield of the crop due to the reason farmers are using their own seed because of non availability of quality seeds. Special crop wise, district wise and region-specific crop wise seed production programmes are required to fulfill the demand of seed created by the farmers. Block wise seed societies, FPOs, can lay a major role in seed production programme. Progressive farmers must include in these schemes. All the technical knowledge along with package of practices can help the farmers for good quality seed production of chickpea crop. Region specific improved verities released by the agricultureuniversities, Govt. Intuitions can promote in these seed production schemes in the Ashoknagar district.

STANDARDIZATION AND DEVELOPMENT OF VALUE ADDED LOW GLYCEMIC INDEX LITTLE MILLET (PANICUM SUMATRENSE) BASED *CHAKLI*

D. C. Shrivastava*, S. Pannase, **S. P. Mishra and R. K Jhade

Krishi Vigyan Kendra Chhindwara
Jwaharlal Neharu Agricultural University,Jabalpur (M.P.)
**Mahatma Gandhi Chitrakoot Gramodaya Vishwavidylaya ,Chitrakoot,Satna (M.P)
Email:dcshrivastava@ jnkvv.org

ABSTRACT

Chakli is a popular deep fried snack food commonly made from rice and green gram dhal. In the present investigation, Firstly, *Kutki*, grains were dehusked and debranned by commercial Vivek millet thrasher. *Chakli* were made from Little millets variety JK-8 with green gram dhal in proportion 2:1.The obtained results showed that all the products revealed more or less same values (7.5 to7.9) with respect to various sensory attributes. However product made from 2:1 proportion contained higher values for various sensory attributes. The nutritional composition of ready-to-eat *chakli* revealed that the products made from various cultivars viz., JK-8 were found to contain average 10.33% protein, 19.2% fat, 56.5% carbohydrates, 1.33% ash, 6.26% crude fiber. For estimation of glycaemic index, an amount of noodles (testfood) and reference food (glucose) supplying 25g of carbohydrate were served on different days. Capillary blood glucose was measured by finger-prick at 0, 30, 60, 90 and 120 min after consumption. The glycaemic index of little millet -pulse chakli (35.65) and were significantly less than plain chakli (42.07). Thus, the developed *chakli* with low glycaemic index can be recommended for inclusion in diabetic diet.

The instant *chakli* flour made from *Kutki* and Greengram in the ratio of 2:1 was also stored in these containers for the period of 2 months .The amount of free fatty acids in the samples during storage did not exhibit any significant variations in different containers and the value were found to vary from 0.23 to 0.35% . The sensory evaluation of *chakli* made from stored flours revealed a good performance of the products and value for flavour, taste and overall acceptability of the products were found to vary in the range of 7.4 to 8.0. Hence, it was concluded that *chakli* flour could be well stored in any containers without deterioration of quality for a period of 2 months. Thus, from nutritional and sensory point of views, *chakli* made from *kutki* minor millets in the ratio of 2:1could be considered as best.

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TECHNOLOGICAL AND EXTENSION YIELD GAPS IN CHICK PEA IN NAVSARI DISTRICT OF GUJARAT, INDIA

K A Shah[1], R A Gurjar[2], S. R. Salunkhe[3] and N. M. Chauhuan[4]

Krishi Vigyan Kendra, Navsari Agricultural University, Navsari 396 450 (Gujarat)
Email shahkinjal@nau.in and shahkinjal@yahoo.co.in

ABSTRACT

The technological gap between existing and recommended technologies for chickpea crop was studied during 2019-20 and 2020-21. In this study, total 400 frontline demonstrations in 40 ha area were conducted on farmers' fields in ten adopted villages. The findings of the study revealed that improved technology recorded a mean yield of 13.12 q/ha which was 21.98 % higher than farmers' practice (10.75 q/ha). The study exhibited a mean extension gap of 237 kg/ha, technology gap of 488 kg/ha with a mean technology index of 27.11 %. A higher mean total income of Rs. 72802/ha with benefit cost ratio of 2.55 were obtained with improved technologies in comparison to farmers' practices (Rs. 59323/ha). The front-line demonstrations conducted on chickpea on farmers' fields revealed that the adoption of improved technologies remarkably enhanced the yield of crops and also the net returns to the farmers.

C14

TO STUDY THE IMPACT OF CLUSTER FRONT LINE DEMONSTRATION OF PULSE ON FAMERS INCOME

Rupendra Kumar, Puneet Kumar , N.S. Bhadauriya B.P.S. Raghuwanshi, K.V. Singh

E-mail: yaduwansi_2009@rediffmail.com

ABSTRACT

A study was carried out in the Bhind district of M.P. to find out the impact of cluster front line demonstration on yield and income of farmers. During the year 2021-22 cluster demonstrations have been carried out in Kharif , Rabi and Summer Seasons Pulse crop like , green-gram, black-gram, and field pea . The area has been covered during the period was 40 ha. and demonstrations were 100 . During the period the variety were taken , TJM-3 and IPM-205-7 of green-gram , Urid-Indira of Black-gram and KPMR-522 of field Pea. Average yield of demonstrations in case of Green-gram (TJM-3) average yield of demonstration was 3.82 q/ha. and produce total seed 3824 kg . IPM-205-7 green-gram variety yield was 7.95 q/ha. and produce 7950 kg seed . Indira-Urid variety of Black-gram taken in summer and produced 9040 kg seed , the average yield wad 9.04 q/ha.

YIELD MAXIMIZATION IN BLACK GRAM THROUGH CFLD ON PULSE PROGRAMME IN SHIVPURI DISTRICT OF MADHYA PRADESH

Pushpendra Singh and M.K. Bhargava

Krishi Vigyan Kendra, Shivpuri, Madhya Pradesh
Email: psinghkvk@gmail.com

ABSTRACT

Black gram (*Vigna mungo* L.) is one of the most important pulse crops, grown throughout the country. The productivity of Black gram is low because of non-adoption of available technologies by the farmers. In this view Krishi Vigyan Kendra, Shivpuri conducted 200demonstrations at farmers field of Shivpuridistrict during the last 4 years i.e., from 2017-18 to 2020-21 through integrated crop management (ICM). It revealed that increase in crop yield was found due to variation in agro-climatic situations under rain fed condition. The result showed that, an average highest yield of FLDs plots of Black gram by adopting ICM technology was 8.54 q/ha compared to farmers practice (6.60 q/ha). Adoption of improved production technology increased the yield 25.39 per cent over farmer practices. The average technological gap, extension gap and technological index were noticed 3.58 q/ha, 1.94 q/ ha and 29.72 per cent respectively. The average net profit of Rs. 23966 per ha was recorded under FLDs plot over Rs 14200 per ha under farmer practice. The higher average grain yield was recorded in demonstration plots over the years compared to local check due to increased knowledge and adoption of full package of practices. However, year wise fluctuation in yield was observed which might be attributed to climatic fluctuations in different years.

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CROP DIVERSIFICATION FROM PADDY AND COTTON TO FLORICULTURE: CASE STUDY IN MAHABUBABAD

N. Kishore Kumar, S. Malathi, E. Rambabu, D.Usha sri, A.Rammulamma, B. Kranthi Kumar

Telangana State Agricultural University - Krishi Vigyan Kendra, Malyal,
Mahabubabad district, Telangana - 506101, India
E-mail: kishoreneelam85@gmail.com

ABSTRACT

In Telangana, nearly 56% of population depend on agriculture.Net cropped area in the state is 7.05 million hectares and paddy is grown in an area of 2.1 million hectares during wet season (*kharif*) and in 1.3 million hectares during dry season (*Rabi*).The area is showing an increasing trend due to sufficient water availability. However, due to continuous mono cropping, several other problems are occurring besides low economic returns. Under such circumstances, crop diversification from paddy to other crops is suggested to increase the economic benefits. The present case study is a successful example of a farmer who switched over from agriculture crops to floriculture and is reaping higher economic returns. Sri Banoth Venkanna from Secunderabad thanda, Mahabubabad district, Telangana, took up tuberose cultivation in place of conventional crops of cotton and paddy in his 2 acres farm since 2019-20. By growing double variety of tuberose with wrinkled petals and bushy in florescense spike and following all recommended agronomic practices, the farmer realized net profits of Rs.1,46,000 per hectare per annum as against his average net profit of Rs. 28,000 per hectare per annum by growing paddy crop prior to diversification. With diversification benefit cost ratio has increased to 5.1:1 as compared to mono cropping of paddy (1.2:1).

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ASSESSMENT OF KHARIF ONION VARIETIES UNDER NIMAR PLAINS CONDITIONS OF MADHYA PRADESH

S K Tyagi, G S Kulmi, R C Aswani, Y P Singh and Y K Jain

Krishi Vigyan Kendra, Khargone - 451001 (M.P.)
Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior (M.P.)
E-mail: suniltyagikvk75@gmail.com

ABSTRACT

On-farm trial (OFT) was conducted during Kharif in 2020 and 2021, respectively on the 07 farmers' fields to evaluate different varieties of onion (*Allium cepa* L.) for growth and yield attributes and their economics under the Nimar Plains conditions of Madhya Pradesh. Two varieties, namely N-53 and Bhima Super were evaluated during experimentation. T_2 (Bhima Super) recorded significantly higher plant height (64.33 cm), number of leaves/plant (13.67), bulb diameter (5.71 cm), bulb weight (96.10 g) and yield/ha (266.86 q) than T_1 (N-53). The maximum net return of Rs 3,39,628/ ha and benefit cost ratio of 3.90 were recorded for T_2. Whereas, the minimum net return of Rs 2,43,928/ ha and benefit cost ratio of 3.15 were recorded in T_1.

EVALUATION OF FRONTLINE DEMONSTRATIONS ON YIELD AND ECONOMICS ANALYSIS OF LENTIL IN MUZAFFARPUR DISTRICT OF BIHAR, INDIA

ArpitaNalia, Nidhi Kumari, B.C. Anu and M. L. Meena

KrishiVigyan Kendra, Turki- Muzaffarpur (Bihar) 843121
Dr. Rajendra Prasad Central Agricultural University, Pusa (Bihar) 848125
Email:arpita.nalia6@gmail.com

ABSTRACT

Front line demonstrations on lentil variety L 4717were conducted at farmers' fields in district Muzaffarpur during *Rabi* seasons of the year 2017-18, 2018-19, 2019-20 and 2020-21. On four years overall average basis about 34.41 per cent higher grain yield was recorded under demonstrations than the farmers' traditional practices. The increase in grain yield under demonstration was 31.69 to 43.28 per cent than farmers' local practices. On the basis of four years, 31.79 percent yield advantage was recorded under demonstrations carried out with improved cultivation technology ascompared to farmers' traditional way of lentil cultivation. An extension gap of 131-207 kg perhectare was found between demonstrated technology and farmers practices during different four years andon average basis the extension gap was 170.2 kg per hectare. The extension gap was lowest (131 kg/ha) during 2017-18 and was highest (207 kg/ha)during 2020-21. Such gap might be attributed to adoption of improved technology in demonstrations which resulted in higher grain yield than the traditional farmers' practices. An additional investments of Rs.1097.4 per ha coupled with scientific monitoring of demonstrations and non-monetary factors resulted in additional return of Rs. 7404 per ha.

On four years overall average basis Incremental benefit: Cost ratio was found as 2.9. Front line demonstration proven was effective in changing attitude, skill and knowledge of improved/recommended practices of lentil cultivation. The difference in technology gap during different years could be due to more feasibility of recommended technologies during different years. Similarly, the technology index for all the demonstrations during different years were in accordance with technology gap. Higher technology index reflected the inadequate proven technology for transferring to farmers and insufficient extension services for transfer of technology. Economic returns as a function of grain yield and MSP sale price varied during different years. Maximum returns (Rs. 53972/ha) during the year 2020-21 was obtained due to higher grain yield and higher MSP sale rates as declared by GOI.

Technical Session : D

Genetic engineering for crop improvement.

D1

EFFORTS TO UTILIZE INTROGRESSED ALIEN VARIATION TO ENHANCE THE HETEROSIS AND ENVIRONMENTAL RESILIENCE OF CMS-BASED HYBRIDS IN *BRASSICA JUNCEA* (L.)

Chhaya Atri* and S.S. Banga

Department of Plant Breeding and Genetics, Punjab Agricultural University, Ludhiana
Email**:** chayaatri@pau.edu

ABSTRACT

Mustard (*Brassica juncea*) is the premier oilseed crop of India. Open pollinated varieties (OPVs) are mostly cultivated in the country. However, heterosis levels of the current hybrids are relatively low and yield losses are heavy due to various biotic and abiotic stresses. Enlarging the genetic base of cytoplasmic male sterile (CMS) lines and fertility restorers(FR) is expected to enhance the performance of the next generation of hybrids. Present communication details our attempts to utilize alien introgression lines (ILs) (*B.juncea-B.fruticulosa*, *B.juncea-Erucastrumcardaminoides*, *B.juncea-E.abyssinicum*, *B. juncea* - *Diplotaxistenuisiliqua* and *B.juncea-B.tournefortii*) to enhance heterosis and improve environmental resilience of mustard hybrids. SNP genotyping and diversity analysis of a large set of these ILs have shown them to be distinct from natural mustard genotypes. Over 150 such introgression lines have been converted into CMS lines. We have also converted over 100 natural mustard genotypes into CMS lines. Analysis of over 1000 hybrids, developed using the same set of fertility restorers, have shown that hybrids based on alien introgression lines produced superior yield performance than the hybrids developed by using natural mustard CMS lines. Many of the CMS lines and the fertility restorers were also superior for tolerance to various biotic and abiotic stresses.

D2

EFFECT OF PGRS UNDER HIGH TEMPERATURE STRESS CONDITIONS ON QUALITYAND YIELD OF TOMATO

Ranjeet Singh[1], BP Bisen[1], Stuti Sharma[2] and Niranjan[1]

[1]Department of Horticulture and [2]Plant Breeding and Genetics, Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur, Madhya Pradesh, India
E-mail : rdranjeet80@gmail.com

ABSTRACT

The study was to minimize the effect of high temperature stress use of salicylic acid (SA) and auxin (NAA) is the growth regulators that modified plant growth and development by inducing changes in cell processes, physiology and morphology. The experiment consists of thirty-six treatments comprising plant growth regulators and three dates of transplanting were laid out in randomized complete block design having three replications. Under this experiment determine the effect of high temperature, SA and NAA on quality and yield parameters TSS, pH, yield per plant (kg) and yield (q/ha) these parameters were recorded at different stages. SA and NAA spray treatment mitigates the effect of high temperature on yield and yield attributes traits in tomato with a better result in yield.

D3

EVALUATION OF CERTAIN ADVANCED GENOTYPES AGAINST MAJOR INSECT PESTS OF SWEET SORGHUM

Gayatri Kawliya[1], D.K. Suryavanshi[2*] and Prince Mahore[3]

[1,3]College of Agriculture – Indore, Department of Entomology, [2]Krishi Vigyan Kendra – Ujjain Rajmata Vijayaraje Krishi Vishwa Vidyalaya, Gwalior - 474002, Madhya Pradesh, India.
Email: dksuryawanshi2008@gmail.com

ABSTRACT

Field experiment was conducted at research field, College of Agriculture, Indore (M.P.).To evaluated twenty-oneadvanced genotypes of sweet sorghum against major insect pests. The percent infestation of shoot fly (*Atherigona soccata*, Rondani), stem borer (*Chilo partellus*, Swinhoe) were assessed and genotype were categories on the basis of reaction. The result revealed that lowest percent infestation of *Atherigona soccata* was recorded in genotype IS18551, IS 2312, SPV 2795 and they were categories as resistant genotypes Similarly, the lowest percent infestation of *Chilo partellus* was recorded in genotype IS 2205, IS 18551, IS 2312, SPV 2795, SPV 2890 and they were categories as resistant genotypes. Whereas number of ear head worm and head bug were recorded on twenty-one advanced genotypes. Number of ear head worm varies from 0.53 to 1.05 per plant, minimum number of ear head worm was found in IS 18551 genotype which was followed IS 2205 and SPV 2794, while on Swarna genotype found maximum number of ear head worm.Number of head bug varies from 0.71 to 1.38 per plant, minimum number of head bug was found in IS 18551 genotype which was followed IS 2312 and SPV 2795, while on Swarna genotype found maximum number of ear head worm.

GENETIC VARIABILITY, HERITABILITY AND GENETIC ADVANCE STUDY IN GARDEN PEA (*PISUM SATIVUM*.)

S K Kaushik R P Sharma and D S Tomar

Krishi Vigyan Kendra-Ujjain (MP)
(RajamataVijayarajeScindhia Krishi Vishwa Vidyalaya-Gwalior)
Email: Kaushik.surendra@rediffmail.com

ABSTRACT

A wide range of genetic variability is available in pea, providing good a scope for improvement in yield and associated characters of pea through selection. To initiate any effective selection programme, depends on available information on the nature and magnitude of variability present in genetic stocks, heritability and genetic advance is of utmost importance for a breeder. Therefore, an attempt was made in the present investigation to estimate the extent of variability, heritability and genetic advance by utilizing twenty one divergent pea lines. An Experiment was carried out at experimental site of Krishi Vigyan Kendra-Ujjain during rabi 2019-20. The observations were recorded on various yield and yield contributing characters. Analysis of variance indicated highly significant difference among the genotypes for all the characters indicating the presence of wide range of variability in the genotypes. The PCV was slightly higher than their corresponding GCV for all the characters. Moderate to high GCV as well as PCV was observed for plant height(27.81 and 27.83), number of branches per plant (21.01 and 21.06), Node of first flowering(18.22 and 18.31), number of pods per plant(18.11 and 18.12), pod length(14.27 and 14.29), number of seeds per pod(13.76 and 13.78), pod yield per plant (19.17 and 19.84) and pod yield per plot (19.49 and 19.57) and indicates the existence of broad genetic base. High heritability coupled with high genetic advance over percent mean observed for the traits *viz.,* plant height, number of branches per plant, nodes of first flowering, number of pods per plant, pod yield per plant and pod yield per plot. Positive and significant association was observed for all the characters with pod yield. These characters are under the influence of additive gene action and selection for genotypic and phenotypic improvement for these traits would be effective.

MULTI HEAD FORMATION IN RATOON CABBAGE HYBRID PLANTS

A.K.Sharma and Jaipaul

G. B. Pant University of Agriculture and Technology, Pantnagar,
Distt. U S Nagar (Uttarakhand)-263 145
E-mail : kvkdehradun@gmail.com

ABSTRACT

Six hybrids of cabbage (Rareball, Sanjivini, Nun-0125 A, Nun 124, Sultana, D-65) were selected for ratooning in the field. The experiment was conducted at VCSG College of Horticulture Bharsar. Highest number of 4 multi-head were formed with highest head weight of 260gm in hybrid. The average weight of multiheaded exceed than main head in 60-65 days in all hybrid cultivars. Mini head were compact, green and weight 200-250 gm in all the hybrids tested. The plants responded well to organic treatments and highest good head weight of 325 g was recorded in Sultana hybrid. Economic feasibility of crop was tested with calculation of B:C in the trail with highest ratio of 2.4 in hybridRareball.

A technique was developed for ratooning in cabbage crop and research work was conducted to determine the economic return under low input system using different organic sources of nutrients. The net return values were obtained highest in main crop in comparison to ratoon crop, but the B:C ratio values were found to be highest in ratoon crop. The highest yield and return values were registered with integrated use of nutrient resources in comparison to other treatments comprised of only organic source of nutrients. Among organic sources of nutrients, poultry manure proved superior over the others in both main and multi-head crop.

MOLECULAR CHARACTERIZATION AND COMBINING ABILITY ANALYSIS FORGRAIN YIELD IN NUTRITIONALLY SUPERIOR MAIZE GENOTYPES POSSESSING NOVEL COMBINATION OF*OPAQUE2* AND *OPAQUE16* GENES

Gulab Chand[1,2], Rajkumar U. Zunjare[1], Tanu Allen[2], Vignesh Muthusamy[1], Subhra J. Mishra[1], Ravindra K. Kasana[1], Vinay Bhatt[1], Mohammad R. Ismail[1,3], Konsam Sarika[4], Satish K. Guleria[5], and Firoz Hossain[1]

[1]ICAR-Indian Agricultural Research Institute, New Delhi, India, [2]Amity Institute of Biotechnology, AMITY University, NOIDA, Uttar Pradesh, India, [3]Maize Research Department, Agricultural Research Center, Egypt, [4]ICAR Research Complex on North Eastern Hill Region, Imphal Centre, Manipur, India, [5]CSK-Himachal Pradesh Krishi Vishvavidyalaya, Bajaura Centre, Himachal Pradesh, India

ABSTRACT

Analyzed a set of seven diverse MAS -derived maizegenotypes possessing *o2* and *o16* for their potential to develop heterotic hybrid combinations with highnutritional protein quality. Molecular diversity analysis of *o2o2o16o16* -based MAS -derived inbreds using 75 polymorphic SSRs revealed 177 alleles with wide variation in gene diversity (0.13 to 0.73), polymorphism information content (0.12 to 0.68) and dissimilarity coefficient (0.34 to 0.80). Phylogenetic analysis grouped the MAS -derivedinbreds into three clusters depicting their genetic diversity. These MAS -derived inbreds were further crossed in half-diallel mating design, and resulting 21 *o2o2o16o16*–based hybrids were evaluated at multi-locations. Ultra-pressure liquid chromatography analysisshowed significantly higher lysine (0.506%) and tryptophan (0.126%) in *o2o2o16o16* -based hybrids compared to commercial *o2*-based QPM hybrids (lysine: 0.346%, tryptophan: 0.086%). ANOVA revealed location (L), and genotype × location (G × L) interaction had minor effects on lysine and tryptophan. Combining ability for grain yield identified several promising inbreds and hybrids high GCA and SCA, respectively. Grain yield among experimental hybrids was significantly associated with genetic distance (r=0.57) and SCA effect (r=0.67). Identified *o2o16* -based hybrids with >7500 kg/ha grain yield, >0.500% lysine and >0.120% tryptophan possess great potential in providing both food- and nutritional- security. This is the first comprehensive study on characterization and genetic analyses of diverse *o2o2/o16o16* genotypes for development of lysine and tryptophanrich high yielding maize hybrids. The identified hybrids with novel combination of *o2* and *o16* provide sustainable and cost-effective solution to alleviate the protein energy malnutrition.

Technical Session : E

Precision farming, soil and water conservation for sustainable agriculture system.

E1

ASSESSMENT OF YIELD AND PROFITABILITY OF MUSTARD AS INFLUENCE BY NUTRIENT MANAGEMENT IN IRRIGATED SITUATION

Uday Kumar Singh* Suman Shital[1], Birendra Kumar[2], Vinay Kumar[3] and Neena Bharti[4]

[*,3,4] KVK, Bokaro, Jharkhand, [1] Department of Agronomy, CBG (Ag) PG College, LU Lucknow.UP-227202, [2]Department of Agronomy, BAU, Ranchi, Jharkhand-834006.
Email: udaysingh72@gmail.com

ABSTRACT

A field experiment was conducted in Petarwar block of Bokaro district, Jharkhand at farmers field condition during *Rabi* season of two consecutive year 2019-20 & 2020-21. Soil of field was sandy loam, medium land having mean organic carbon 0.38 gkg-^{1}, pH 5.9, available N 180 kgha-^{1} Available P_2O_5 28 kgha-^{1} and K_2O 190 kgha-^{1}. The experiment was conducted under RBD design with ten replication comprising three treatments T_1; Farmers practice (20 kg N, along with 8-10 kg P_2O_5 per ha) T_2-50 % RDF (40:30:20 kg N: P_2O_5: K_2O ha-^{1} + *Azotobacter* + PSB) and T_3 – 100 %RDF +20 kg S ha-^{1} and each farmer considering one replication. Data on growth, yield attributes and yield from different field were recorded both the years, compiled and pooled data analyzed as per standard RBD statistical method. Pooled data showed that, Treatment (T_3) 100 % RDF + 20 kg S ha-^{1} recorded moreplant height (141.40 cm), number of silique per plant (248.2), seeds per silique (14.4) along with test weight (1000- seeds weight, 3.9 g), which significantly superior over farmers practice . Further, T3, application of 100% RDF (80:60:40 kg NPK/ha) along with 20kg S/ha also recorded maximum seed yield (11.28 qha-^{1}) which resulted into more Gross return (Rs 67,680 ha-^{1}), Net return (Rs 40,255 ha-^{1}) and B: C ratio 3.67.

ATTITUDE OF FARMERS TOWARDS USE OF SPRAYING DRONE IN AGRICULTURE

D S Yadav[1], Pankaj Sood[1], LK Sharma[1], Kunal Sood[2] and Arvind Kumar[3]

[1]Krishi Vigyan Kendra, Mandi Himachal Pradesh, [2]CSK Himachal Pradesh Krishi Vishvavidyalaya, [3] ICAR-ATARI Zone 1 Ludhiana, Punjab
Email: dsyadavhpau@yahoo.com

ABSTRACT

The study assessed the attitude of farmers towards the use of spraying drone in agriculture. Based on the philosophy of KVK, "Learning by doing and seeing by believing", on farm field demonstration on spraying drone was conducted in purposively selected DFI adoptedPalhota village of Mandi district of Himachal Pradesh during the month of August, 2022. Data on awareness, attitude, expected adoption and concerns of farmers in the use of spraying drone was collected from 46 participating farmers in the field demonstration though interview schedule designed for the purpose. The farmer's awareness level about the use of drone was assessed prior to the conduct of demonstration. Lateron, after conducting actual field demonstration of spraying drone in paddy fields their attitude, expected adoption and concerns in the use of spraying drone was measured.

The study revealed that nearly 50 percent of the farmers were not aware of the spraying drone however, slightly more than half of the farmers were aware about this technology but were not aware about its benefits. It was observed from the study that majority (82.61%) of the farmers reflected favorable to highly favorable attitude towards the use of spraying drone. With regard to the expected adoption of spraying drone, about 70 percent were of opinion to use the spraying drone in their fields through outsourced basis while about 25 percent were ready to purchase and make use of drone in their own and other farmer's fields if financially supported by the government. Very few farmers (6.52%) were not interested for the use of spraying drone. Low battery life with frequent charging, high cost of drone, high drone pilot licensing fee, lack of crop specific standardized doses of fertilizers & pesticides, use of drone in sloppy fields and lack of drone training institutions in the state were the major concerns of the farmers about use of spraying drone in agriculture. Though, farmers' possessed favorable attitude, it is high time to take up the technology through field demonstrations for wider outreach. At the same time there is a need to look into the concerns of hill farmers about this noble technology.

E3

EFFECT OF MULCHING WITH DRIP IRRIGATION ON WATER USE EFFICIENCY AND YIELD OF BITTERGOURD

Vinay Kumar, U.K. Singh, Anil Kumar, A.K. Sinha and Neena Bharti

Scientist, Krishi Vigyan Kendra, B.A.U. Ranchi, Jharkhand
Email:vinay.kvkbokaro71@gmail.com

ABSTRACT

The field experiment was conducted in Bittergourd crop in Bokaro district of Jharkhand during the cropping season March-May in three consecutive year 2016, 2017 and 2018. The study was investigated the effects of non mulch and plastic mulch (25 microne) of black and silver colour with drip irrigation in bittergourd to evaluate the yield, water use efficiency and economic feasibility of bittergourd. The analysis reveals that the silver plastic mulch recorded highest fruit weight (6.7 kg/ plant), highest yield (402q/ ha), highest water use efficiency (3284 kg/ ha/ cm) and highest B: C ratio (3.21) in comparison to other treatments. Thus this study suggests silver plastic mulch as an effective mulching material which increases the yield (26.4 percent) and water use efficiency (89.6 percent) in comparison to without mulch in bitter gourd.

E4

EFFECT OF NITROGEN AND IRRIGATION ON SOIL WATER CONTENT AND NITROGEN DISTRIBUTION IN SPRING MAIZE

K.B. Singh and Simran Kaur

Punjab Agricultural University, Ludhiana
E-mail : kbsingh@pau.edu

ABSTRACT

The presentstudy was conducted on the sandy loam soil at Punjab Agricultural University, Ludhiana in spring maize during the year 2019 with split plot design having 125 (N_1), 100 (N_2) and 75 (N_3) kg/ hanitrogen levelsin main plots and sub-surface drip irrigation at 100 (I_1), 80(I_2), 60 (I_3) percent of ETc and surface drip at 80 percent ETc (I_4) in sub plots to simulate the N and water distribution in soil profile using HYDRUS-2D model. Higher water i.e. 0.18-0.3 $cm^3cm^{-3}$and nitrogen content i.e. 0.43-0.12 mg/ml was observed at 10 cm emitter spacingcompared to 20 cm emitter spacing i.e.0.39-0.10 mg/ml whereas depth wise maximum concentration i.e. 0.30 $cm^3cm^{-3}$and 0.52 mg/ml was observed in depth of 20-40 cm soil layer compared to all other depths in sub-surface drip. However in surface drip higher content of N i.e.0.48 mg/ml and water i.e.0.30 $cm^3cm^{-3}$was found at 0-20cm depth. Hydrus 2-D model satisfactorily predicted water and N distribution in soil with significant values of $R^2$0.92-0.95 and 0.94-0.96, RMSE value of 0.024-0.011 cm^3cm^{-3}and0.025-0.015mg/ml and NSE0.88-0.90 and 0.92-0.95 .

IRRIGATION WATER USE PROFILE AND CONSTRAINTS FACED BY THE FARMERS IN PUNJAB

Navdeep Kaur and Vipan Kumar Rampal

Krishi Vigyan Kendra, Faridkot, Punjab Agricultural University
Email; rampalvk@pau.edu

ABSTRACT

The study was conducted to identify constraints faced by the farmers in using water fromexisting sources of irrigation in Punjab. Five districts, Sangrur, Hoshiarpur, Ropar, Fazilkaand Bathinda, were selected based on the highest acreage under Punjab's five major crops.Employing a multi-stage sampling method, 20 villages were selected from these selected five districts of Punjab. Further, from each village, a sample of 25 respondents was randomly selected. Thus, a total of 500 farmers were selected. Results revealed that about 68 percent of the respondents were of the middle age group of 37-62 years, had gained education up to matriculation and fell in the category of semi-medium (5-10 acres) operational land holdings. Relevancy rating was used to identify and prioritize the major constraints faced by respondents.

In Hoshiarpur and Ropar districts, the farmers' most felt constraint was the non-availability of canal water with a higher relevancy rating index. In the Sangrur district, there levancy rating index was higher toward constraint of the high degree of losses during conveyance due to poor maintenance of the canal. In Bathinda and Fazilka, respondent's had canal irrigation system facilities, but water shortage in the canals during crop season was the most critical constraint. Another primary constraint faced by the respondents of all the districts was deepening the bore well every year or alternate year. So, it was suggesting making availability of canal water over the state and providing information regarding water harvesting and water saving technologies.

PERFORMANCE EVALUATION OF PRECISION PLANTER FOR SYSTEM OF CHICKPEA INTENSIFICATION

P. D. Verma[1], A. S. Rajput[2] and Pradeep Kashyap[3]

KrishiVigyan Kendra – Bhatapara,
Indira Gandhi Agricultural University, Krishak Nagar, 492012, Raipur, CG, India
Email: pdvermafmp@gmail.com

ABSTRACT

Chickpea (Cicerarietinum L.) is the second-most important pulse crop after pigeonpea in the World for human diet and other use. It is cultivated in area of 13.54 million hectares with a total production of 13.10 million tonnes and average productivity of 967.6 kg/ha (FAO 2013). After measurement the physical properties of chickpea i.e. average aspect ratio, surface area, bulk density, true density, moisture content and porosity of chickpea were observed 75.54%, 157.379 mm^2, 709.55 kg/m^3, 875.50 kg/m^3, 19.81% and 18.62% respectively.in field performance the average speed of operation, field capacity and field efficiency of developed precision planter were observed 2.5 km/h, 0.075 ha and 71% respectively. Plant height was found highest in T_1 at 30 DAS, 60 DAS, 90 DAS and at harvest i.e. 20.28 cm, 35.75 cm, 46.00 cm and 58.05 cm respectively followed by T_2, T_4, T_5 and T_3 respectively. Pods per plant were found highest in T_1 i.e.115.27 followed by T_2, T_3, T_5 and T_4 i.e. 113.38, 107.60, 107.11 and 105.62 respectively. Maximum grain yield of chickpea was found in T_1 which was 2826.67 kg/ha and minimum was observed in T_4 i.e. 2317.09 kg/ha. Grain yield of T_1 was found 18.63%, 3.26%, 21.99% and 20.45% greater than the T_2, T_3, T_4 and T_5 ,respectively.

OPPORTUNITIES AND THREATS OF CUSTOM HIRING CENTRES IN FARM MECHANIZATION IN SRIKAKULAM DISTRICT OF ANDHRA PRADESH

P.Venkata Rao*, S.Neelaveni and G ChittiBabu

ANGRAU-DAATTC,Srikakulam,A.P
E mail: venkyp75@gmail.com

ABSTRACT

Establishment of Custom Hiring Centre (CHC) in farm mechanisation is a boon for farmers especially for the small and marginal farmers but yet to reach in large scale. This holds good for srikakulam district . Keeping this in view an extension study has been taken up on"SWOT Analysis of Custom Hiring Centres in Farm mechanization in Srikakulam District with an objective to know the opportunities and threats in Custom Hiring Centre (CHC) in farm mechanisation" . 30 Custom hiring centres located infive sub divisions of the district were selected purposefully for the study.The respondents selected for the study were CHC owned farmers , hired farmers and non hired farmers each 30 ,thus total sample size was 90.An exploratory research design used for the study. Results revealed that that cent per cent of the respondent farmers perceived labour scarcity and high wage rates as the opportunity to establish custom hiring centers.95.55 per cent farmers perceived the Disappearance of cattle for field operations as an opportunity for CHCs. Govt. schemes and subsidy on farm machinery for farmers perceived as opportunity by the 93.33 per cent of the respondent farmers .Cent per cent of the respondent farmers perceived Small land holdings as a threat for establish CHCs, High initial investment perceived as threat by the 97.78 per cent farmers, 94.44 per cent farmers perceived the farmers migration to other sectors as a threat and Lack of trained personnel for repairs as threat by 91.11 per cent. Farmers suggested that at least one Custom Hiring Centres hould be established by the Government at mandal level so the price of custom hiring of agricultural machinery is fixed and low as compared to offers by private CHCs. Policy makers may consider the weaknesses to formulate solutions for these problems and consider the strengths for further improvement in promotion and establishment of CHCs.

A CASE ON CONSERVATION AGRICULTURAL TECHNIQUES ADOPTED BY FARMER FOR SUSTAINABILITY

Talathi M S, Mandavkar P M, Manjrekar R G , Gitte M J , Padhye S J, Arekar J S and Mahadkar U V

Krishi Vigyan Kendra, Roha-Raigad
Dr.B.S. Konkan Krishi Vidyapeeth, Dapoli, Dist. Ratnagiri, (M.S.)
Email:manoj84048@yahoo.co.in

ABSTRACT

Mr. Santosh Divakar, a farmer of Yashwantkhar, of RohaTaluka of Raigad District is very popular among organic farmers in Konkan region and doing organic farming under the guidance of KVK Raigad, MS. After the traditional farming in 4-5 years he was forced to change his farming practices for increasing the yield of crops by adopting latest University technologies under KVK guidance. As a result, he started using high yielding varieties, fertilizers, pesticides etc. KVK Raigad created awareness about soil health and quality produce.There was a quantum jump in his yields because of adopting improved practices. Then, he started practicing organic farming thinking that it would help in reducing the cost of cultivation and would reduce the pH of the soil. In the initial years he had the problems of pests and diseases and soil was also not good enough to give better yield. He immediately contacted KVK scientist and officials from department of Agriculture for discussing the problems in farming. He owns five excellent dairy cows of Gir species. The cows supply valuable manure. He makes good profit from selling the milk. He started preparing vermicompost with farm wastes and cow dung (FYM). He also started preparation of organic inputs like Jeevamrut, Dashaparni Ark etc on his own farm.They are applied in the field as and when necessary. He is paddy farmer and follows paddy-pulses-vegetables cropping system in his farm. He started fresh water fish farming as a subsidiary farming activity by rearing Indian Major Carps under the guidance of KVK, Raigad. His net income through organic paddy was Rs.16000 from one acre of paddy crop. He has good kind of outreach activities and awarded by prestigious institutes.

SLIT-TILL-DRILL: A PROMISING TECHNOLOGY FOR CONSERVATION AGRICULTURE

Manish Kumar[1*], Dushyant Singh[2], N S Chandel[1], Anurag Patel[3] and A K Vishwkarma[4+]

[1,1*,2,3]ICAR-CIAE, Bhopal and [4]ICAR-IISS, Bhopal
E-mail: manishagrineer@gmail.com

ABSTRACT

A tractor-operated 10 row slit-till drill was developed in the ICAR-Central Institute of Agricultural Engineering, Nabibagh, Berasiya road, Bhopal. The performance was evaluatedat institute research farm as well as at farmer's field and the same has been compared with farmers practice and most popular conservation agriculture machine i.e. tractor drawn 10 rows happy seeder. The yield, energetics and economics of wheat crop were evaluated. The wheat variety of HI-1544 was sown in the *Rabi* season under rice residue conditions. The performance parameters of the selected slit-till drill were compared with a happy seeder and conventional seed-cum-fertilizer drill. The energy consumption was maximum in the case of sowing with a conventional seed drill (11040 MJ/ha) including two-pass of a cultivator and one pass of rotavator, which was followed by of slit-till-drill (10037.03 MJ/ha) and happy seeder (10096 MJ/ha). The cost of operation of slit-till drill, happy seeder and conventional seed-cum-ferti drill was Rs. 1564/ha, Rs. 1673.0 ha and Rs. 2302 /ha. The still-till drill could save 32% on the cost of operation and 10% in energy as compared to conventional seed-cum-fertilizer drill.The yield of wheat variety of slit-till drill was at par with happy seeder and higher as compared to conventional method.

Technical Session : F

Integrated nutrient, diseases, weed and pest management in crop production

F1

ALLELOPATHIC EFFECTS OF SOME FRUIT PLANT SPECIES WITH WEEDS

M.S. Sachan[1]*, D. Dey[1], P. Michui[2] and R. Mezhatsu[3]

[1]Krishi Vigyan Kendra, (Divyodaya), Khowai, Tripura- 799 207, [2]Krishi Vigyan Kendra, Mon (Aboi), Nagaland- 798 603, [3]Krishi Vigyan Kendra, Kohima (Tesophenyu), Nagaland- 797 109
*Correspondence author- sachankvkmon@gmail.com

ABSTRACT

Aqueous extracts ofseven fruit plant species viz., banana (*Musa paradiseca*), Indian gooseberry (*Phylanthus emblica*), jack fruit (*Artocarpus heterophyllus*), guava (*Psidium guajva*), mango (*Mangifera indica*), litchi (*Litchi chinensis*), wood apple ((*Aegle marmelus*) were tested for germination, radical and plumule growth of barnyard grass and green amaranth. The lowest germination percentage (9.5 and 14.4%), plumule(3.94 and 0.92 cm) and radicle length (0.825 and 0.495 cm) of barnyard grass and green amaranth seedlings was obtained in seed treated with wood apple aqueous extract due to presence of some toxic compounds or other inhibitory materials in the species. One of these plant extract which performed the best i.e. wood apple have potential for use as alternative crop as herbicide (protectants) against a number of weed species.

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ASSESSMENT OF CLUSTER FRONTLINE DEMONSTRATION ON YIELD GAP AND PROFITABILITY OF CHICKPEA

D K Tiwari*, S K Badodiya, D K Jain, R S Sikarwar and U S Awasya

*RVSKVV, Krishi Vigyan Kendra,Barwani (MP)
E-mail : tiwaridk78@gmail.com

ABSTRACT

The cluster frontline demonstration on gram were conducted by Krishi Vigyan Kendra, Barwni. The improved technologies consisted of improved high yielding variety, pre-emergence weedicides, use of biofertilizers as a seed treatment, vermicompost, neem based pesticides and yellow sticky card as insect-pest management. The result revealed that the highest grain yield was obtained in demonstrated plot with an average of 1765 kg/ha compared to 1156.7 kg/ha in farmer's practice. Higher average gross return (Rs. 93472/ha) and net return (Rs.68639/ha) was obtained in the demonstration plots compared to farmers' practice plot (Rs. 61743/ha) and (Rs.38800/ha) respectively.The average B:C ratio was 3.80 in demonstrated plot compared to 2.80 in farmer's plot. The average increase in the demonstration yield over farmers' practice was 52.89 per cent and net return increase over farmers' practice was 77.70 per cent. The average technology gap of 235 kg/ha whereas the average extension gap of 608 kg/ha and average technology index 11.80 percent was recorded.

ASSESSMENT OF INTEGRATED WEED MANAGEMENT FOR SUSTAINABLE RICE PRODUCTION IN REWA DISTRICT OF M.P.

Smita Singh, A Kumar, A K Patel, M K Mishra and A K Pandey

Krishi vigyan Kendra, Rewa (M.P.)-486001
Email: sapnapuat@gmail.com

ABSTRACT

A single method of weed control is usually not successful. Weed management is a combination of practices that lead to sustainable rice production. Weed management is a long-term process aiming of optimizing farm productivity, by maintaining weed levels below levels which compete significantly with the crop. It must maintain a balance between economic, social and environmental considerations (Kon, 1992). Weed management is a combination of several strategies, including selection of rice cultivars, planting methods, land preparation, appropriate irrigation, time of planting, crop rotation, harvesting methods, biological control agents, allelopathic substances, preventive weed control methods and judicious chemical weed control (Smith Jr., 1993). Sustainable rice production should depend on decreased use of chemicals and other fossil-based inputs, while at the same time securing increase of yield reducing production costs, improving farm profit, reducing risk, and sustaining the productivity of the soil and water resources (Harwood, 1990). In the consideration of each method of weed control for incorporation into weed management, differences in rice cultivation methods are important to achieve sustainable rice production. Krishi Vigyan Kendra, Rewa has conducted on farm trials at adopted farmer's field. Fifteen on farm trials on integrated weed control practices were laid at two villages of Raipurkarchulian block of Rewa district in transplanted rice during Kharif season of 2018-19 to 2020-21 to analyze the performance andprofitability of herbicide and herbicide + hand weeding, *viz*. pyrazosulfuron-ethyal 20g/ha after 3DAT and pyrazosulfuron-ethyl + one hand weeding at 25 DAT, respectively on weed growth and productivity of transplanted rice at farmer's fields. The farmers' fields were found infested with mixed flora of grasses, sedges and broad-leaved weeds. The herbicide + one hand weeding at 25 DAT used for demonstrations were found to be highly effective in controlling weeds and thereby increasing grain yield of rice by 47% over farmers'practice based on the intensity and growth of different weed flora. The benefit cost ratio of integrated demonstration over the farmers' practice varied from 1.58–2.43/ha.

ASSESSMENT OF IPM TECHNOLOGY IN THE MANAGEMENT OF ONION THRIPS

Akhilesh Kumar, Smita Singh, Rajesh Singh, TK Singh*and A.K. Pandey

JNKVV-Krishi Vigyan Kendra, CoA, Rewa, MP, *JNKVV-College of Agriculture, Rewa, MP
E-mail:akhiliivr@gmail.com

ABSTRACT

Onion thrips, *Thrips tabaci* Lindeman (Order Thysanoptera, Family Thripidae), is a key insect pest in most onion production areas of the world. Extensive feeding by onion thrips not only results in plant stunting and reduced bulb weight, but it also predisposes onion plants to various fungal and bacterial pathogens that further decrease yield. Hot and dry weather can lead to an increase in onion thrips populations and the severity of thrips injury to onion. Thrips also vector Iris yellow spot virus (IYSV)), which can kill onion plants before they fully mature as well as reduce bulb sizes. In order to assess technology inOnion crop under irrigated condition.On farm trialwere conducted in different location of Rewa (MP) on 05famers' field with three treatments in 2020-21and 2021-22. To evaluate the performance ofrecommended practice in Onion Mass trapping with yellow sticky trap @ 4000/ha, Neem oil @ 2000ml/ha and spraying of pre-mixed Imidacloprid + Fipronil 80WG @ 150 gram/ha with adhesive material @ 330ml/ha at fortnightly interval(RP-2) was found very effective to reduce the thrips infestation fallowed by Profenophos 50 EC @ 500 ml/ha at 35 DAT with adhesive material @ 330ml/ha at fortnightly interval(RP-1)and compared with farmers practices (FP) was found more infestation of thripsthan recommended practice (RP). Economics and benefit cost ratio of both FP and RP plots were worked out. Onion thrips average population per plant was recorded in farmer practice very high 24.10 while in research practice 1 was 11.5 and in research practice-2 was very low infestation 3.86 per plant.In onion production average of two years net profit was recorded Rs. 269106.00/ha under RP-2 while in RP-1it was Rs. 216007.50/ha and under FP Rs. 171349.50/ha. The economics of marketable bulb yield in onion averageover two years revealed that adoption of IPM treatments was highest Benefit cost ratio was 3.89 under RP-2, while 3.42 under RP-1 and 2.95 was in FP and the bulb yield recorded highest in RP-2 241.58 Q/ha, RP-1 203.35Q/ha and in FP 172.78Q/ha . The assessed technology RP-2 is found most suitable for reduced thrips population and most economic for the management of bulb weight losses in Onion in comparison with farmers practices.

ASSESSMENT OF POST EMERGENCE WEEDICIDE FOR EFFECTIVELY CONTROL WEEDS OF BLACKGRAMIN RAISEN DISTRICT OF MADHYA PRADESH

Swapnil Dubey, P. K. Dwivedi and Mukul Kumar

Krishi Vigyan Kendra, Raisen-464551 (M.P.) India
E-mail: swapnildubey45@yahoo.com

ABSTRACT

An On Farm Trial (OFT) was conducted in the farmer field of adopted village of Krishi Viygan Kendra, Raisen (M.P.) in kharif season of 2016, 2017, and 2018.To assess the effect of integrated weed management on weed management and yield of blackgram. The major weed flora was found in the blackgram field*viz. Cyperusrotundus*, *Echinochloacrusgalli*, as narrow leaf and *Digera arvensis*, *Commelinabenghalensis* and *Phyllanthus niruri*braoad leaf weeds. Among post emergence weed control treatments recorded the lowest weed density &weed dry matter and highest yield attributes.The Highest weed control efficiency was recorded under post emergence application of *Imazethapyr* 35% + *Imazamox* 35% WG@50 g*a.i.* / ha (78.76%) followed by*Imazethapyr*@70 gm *a.i.* /ha(59.33%) over farmer practices. The Highest value of Plant height (60.70 cm),branches per plant(4.96),pods per plant(32.50),1000 seed weight(48.20g)were recorded under post emergence application of *Imazethapyr* 35% + *Imazamox* 35% WG@50 gm *a.i.* / ha. Weed control treatments *Imazethapyr* 35% + *Imazamox* 35% WG@50 g*a.i.* /ha recorded better crop growth and seed yield (881 kg /ha) along with maximumnet return (Rs26150/ha) and benefit cost ratio (2.46) without any phytotoxic effect on crop.

ASSESSMENT OF ROOT DIPPING IN SSP-MC SLURRY METHOD OF P MANAGEMENT IN PADDY IN KHOWAI DISTRICT OF TRIPURA

D. Dey[1], M. S Sachan[2], S.C Biswas[3]

KrishiVigyan Kendra, Khowai, Chebri-799207
Email:- ddey611@gmail.com

ABSTRACT

Rock Phosphate and integrated nutrient management is often recommended to increase crop productivity on acidic soils. To ascertain the effects of application of Rock Phosphate @125 kg/ha,50% of RDF of N and K application along with Root dipping of Paddy seedlings in SSP-microbial Cultureon Paddy productivity,a three year long field experiment was conducted by KVK, Khowai on Phosphorus deficit acidic soil at Khowai district of Tripura for evaluation of effect on status of post harvest available Phosphorus, soil organic carbon, crop yield of Paddy. Addition of rock phosphate along with root dipping of Paddy Seedlings in SSP-microbial culture Solution along with addition of 50% RDF of Nitrogen and Potassium increased post harvest available phosphorus status along with soil organic carbon content. However crop yield drastically increased under application of Rock Phosphate along with Root dipping of Paddy seedlingswith SSP-mc slurry and addition of 50% dose of RDF of Nitrogen and Potassiumas compare to the direct transplanting of Paddy Seedlings along with RDF of Nitrogen, Phosphorus and Potassium. Results of this study suggested application of Rock Phosphate@125 kg/ha instead of SSP along with application of 50% of RDF of Nitrogen and Potassium along with Root dipping of Paddy seedlings in SSP-microbial Cultureif applied properly can lead to significant increase in crop productivity of Paddy along with increase in availability of available phosphorus on acidic soils of Khowai district of Tripura and other districts of Tripura with similar soils.

DIRECT DRY SEEDED RICE (DSR) –TECHNOLOGY TO TRIM DOWN THE CONSUMPTION OF WATER AND LEADS TO DOUBLING THE INCOME

B O Mallikarjuna[1],T N Devaraja[2], JRaghuraja[3] and Basavangowda M G[4]

ICAR-Taralabalu Krishi Vigyan Kendra, Davanagere 577005 (Karnataka)

ABSTRACT

Direct Dry seeded Rice (DSR) technology in paddy introduced through ICAR-Taralabalu KVK to the tailend farmers for reduction in cost of production and increase the income. The technologies used were sowing through Seed cum fertilizers drill, Seed treatment with bio fertilizers, Weed management and application of RDF along with PP measures.The demonstration was conducted for the last 3 years (2017 and 2020) and the average results were as follows the cost of production **Rs.** 47378/ha and yield was 60.45 q/ha. In manual transplanted Rice (MTR), the average cost of production of Rs. 66207/ha and yield of 59.44 q/ha. In demonstration plot recorded the average net profit of Rs. 60050/ha with B:C ratio of 2.27 when compared to Rs. 39277/ha with Benefit cost ratio of 1.59 in check plot. We had conducted training for the farmers and farmwomen on the DSR and even provided the leaf lets, folders to the farmers and gave wide publicity through different medias. The net income of DSR was higher than MTR due to lower cost of production and it is due to substantial reduction in machineries (41.34%), irrigation (22.45%) and human labour (6.62%).

EFFECT OF BIOAGENTS ON CUCUMBER SEED MYCOFLORA, SEED GERMINATION AND SEEDLING VIGOUR

Arti Shukla [1], Aman Sharma[2] and Meenu Gupta[2]

[1]HRTS & Krishi Vigyan Kendra, Solan at Kandaghat, [2]Department of Plant Pathology, UHF, Nauni, Solan, Himachal Pradesh

ABSTRACT

Cucumber (*Cucumis sativus* L.) is economically the most important plant in the cucurbitaceae family. Many seed borne fungal pathogens reduce seed germination and seedling vigour in cucumber. In order to test the antagonistic activity of different bioagents viz., *Trichoderma harzianum, T. viride, T. virens, Pseudomonas fluorescens*, and *Bacillus subtilis* against seed mycoflora, seeds of cucumber variety Solan Srijan were soaked for 4 hours in *Trichoderma* spp.(10^6 cfu/ml) and bacterial bioagents (10^8 cfu/ml) broth. The infestation of seed with mycoflora was observed using the standard Petri plate method , as recommended by ISTA. The number of infected seeds were counted and the percent inhibition of mycoflora was calculated. All five test bio agents significantly inhibited seed mycoflora of *Alternaria* sp. as compared to the untreated control with per cent inhibition ranging from 89.00 to 95.00. *T. harzianum*, on the other hand, inhibited mycoflora the most (95.00 percent) followed by *T. virens* (94.00 percent). *T. viride* showing the greatest inhibition for *Aspergillus* sp. while, *T. harzianum*, inhibited *Fusarium* spp. the most (96.00 percent), followed by *T. virens* (94.00 percent) and *T. viride* (93.00 percent) while, *Bacillus subtilis* (87.00 percent) was the least effective. To test the effect of bioagents on seed germination and seedling vigour, seeds of cucumber var. Solan Srijan (100 seeds per replication) were first treated with bioagents and then placed in the seed germinator at 25°C to observe germination using paper roll and blotter paper method. Root and shoot lengths of ten randomly selected normal seeds were counted on 8^{th} day and finally seedling vigour was calculated. *T. harzianum* was found most effective in increasing seed germination (88.75 percent), root length (13.58 cm), shoot length (14.58 cm), and seedling vigour (2501.31) of cucumber variety Solan Srijan followed by *T. virens* while, *Bacillus subtilis* was the least effective. Hence, in the present studies, *Trichoderma harzianum* was found most efficacious in reducing seed mycoflora, improving seed germination and seedling vigour.

EFFECT OF INTEGRATED NUTRIENT MANAGEMENT IN SUMMER RICE (*ORYZA SATIVA* L.) IN TERAI ZONE OF WEST BENGAL

Senjit Singh Ashem and Ashis Kumar Singha Roy

Uttar Banga Krishi Viswavidyalaya, Cooch Behar - 736165 (West Bengal)
Email:senjitsingh2011@gmail.com

ABSTRACT

A field experiment was carried out at Uttar Banga Krishi Viswavidyalaya, Cooch Behar, West Bengal during two consecutive summer season of 2018 and 2019 to evaluate the effect of judicious use of chemical fertilizers, organic manures and zinc on summer rice (cv. Gotra Bidhan-1). Among the different nutrient management practices, treatment receiving 75% of recommended dose of N through fertilizer +25% recommended dose of N through vermicompost + 25 kg $ZnSO_4$ ha^{-1} registered significantly the highest yield components and grain yield (5.10 t ha^{-1}). The total uptake of N, P, K and Zn nutrients by crop was remarkably increased by the treatment receiving 75% of recommended dose of N through fertilizer +25% recommended dose of N through vermicompost + 25 kg $ZnSO_4$ ha^{-1}.Integrated nutrient management enhanced the organic carbon and available N, P, K and Zn contents in the soil. Significant variation in N, P, K and Zn content of soil due to various treatments could be observed after harvest of summer rice. The highest net return (Rs. 40560 ha^{-1}) and benefit:cost (1.80) ratio was recorded from the same treatment plots.

EFFICACY AND ECONOMICS EVALUATION OF INSECTICIDES AGAINST RICE STEM BORER *(SCIRPOPHAGA INCERTULAS* WALKER) IN REWA DISTRICT OF M.P.

J. P. Solanki[1], H. K. Trivedi[2] and V. K. Jain[3]

[1] College of Agrilculture JNKVV Jabalpur, RVSKVV, [2,3]Krishi Vigyan Kendra, Ashoknagar
Email: hkt_pp@rediffmail.com

ABSTRACT

The low productivity of the crop in the Rewa district is due to mainly by biotic stresses. Amongst them a larger number of insect pests in especially in tropical region is attacked by them right from the time of sowing till it is harvested. Rice stem borers are a major insect which is damaging of rice crop. There are five species of stem borers distributed throughout India. Among these, yellow stem borer (YSB),*Scirpophagaincertulas* (Walker) is the most wide spread, dominant and destructive. The other borers are, pink stem borer, *Sesamiainferens* (Walker) occurring mostly in rice-wheat cropping systems. Among the stem borers, the yellow stem borer, *Scirpophagaincertulas* (Walker), Lepidoptera: Pyralidae, is the most important pest of rice, particularly in lowland and deep-water rice. The pest attack all stages of the crop , tillers during the vegetative stage recognized as 'dead heart' and the panicle stage in the form of 'white ear head' (chaffy, unfilled grains).The trail on the efficacy of insecticides against stem borer of rice had indicated the effectiveness of all insecticides against the pest, but variation in the effectiveness among insecticides was observed. Efficacy of insecticides had indicated that Chorantraniliprol @ 30ga.i/ha was superior over rest of insecticides. It gave 83.21% less infestation of the pest after two spray (30& 50 DAT) of insecticides. In the present study, Quinalphos @ 250ga.i/ha was next in order of effectiveness after Chorantraniliprol, which reduced the pest population by 72.72% and it was followed by Flubendamide (71.33% reduction).

EFFICACY AND EVALUATION OF IPM MODULES AGAINST FALL ARMYWORM *SPODOPTERA FRUGIPERDA* (LEPIDOPTERA: NOCTUIDAE) IN MAIZE

S. S. Sarangdevot, Shilpi Verma, P. S. Naruka, C. P. Pachauri and J. P. Singh

KVK, Neemuch
E-mail : acshilpi@gmail.com

ABSTRACT

The appearance and rapid spread of the fall armyworm (Spodopterafrugiperda) (FAW) represents a significant threat to maize cultivation in India. Chemical control illustrates one amongst the foremost means of reducing the infestation of FAW in maize-growing zones. The emergence of this notorious, polyphagous pest presents a serious challenge to maize farmers and national food security in India. However, existing information regarding the field-efficacy different insecticides against this pest isn't adequate and insecticide resistance for redacting sustainable management. The current study was framed to ascertain the foremost suitable insecticidal schedule against FAW for maize producers of Neemuch district (M.P). Within the year 2020–2021, three treatment schedules against FAW were evaluated, and therefore the efficacy was calculated in line with the per cent maize plant damage (PD) by larvae. It absolutely was found that the very best cumulative efficacy (2.51% PD) was confirmed for T3 (constituted with cyantraniliprole, thiamithoxam, bird percher/ha, fugiperda pheromone trap, emamactin benzoate) with a significantly higher yield (48.77 q ha−1), whereas T2 (constituted with cyantraniliprole, thiamithoxam, bird percher/ha, fugiperda pheromone trap, Bacillus thurigensis) exhibited cumulative efficacy (4.45 % PD). The mean yield of IPM module T3 was 48.77 q/ha with net returns and C:B ratio of Rs. 53800/ha and 1:1.43, respectively. Whereas, farmer's practice recorded a mean yield of 43.3 q/ha with net returns and C:B ratio of Rs. 44471/ha and 1:1.21, respectively. Therefore, the module T3 might be recommended against FAW within the near future.

EFFICIENCY OF CHEMICAL HERBICIDES AGAINST WEEDS IN ONION (*ALLIUM CEPA*) IN BAGALKOTE DISTRICT

S.P.Dinesh Kumar, M.R. Kammar and Sudha S

ICAR-Krishi Vigyan Kendra, Bagalkote-587101 (Karnataka)
Email: dineshspuasd@gmail.com, dineshkumarsp@uasd.in

ABSTRACT

The challenging tasks for the farmers' to get higher yield and returns in onion crop are weed management. A field demonstration on weed management in onion was under taken during *kharif* 2019-20, and 2020-21 at farmers' field of Baglkote district of Karnataka. Among the herbicidal treatment pre-emergent application of Pendimethalin 30% EC @ 3.25 l/ha followed by post-emergent application of Oxyflurofen 23.5% EC @ 1.10 l/ha at 30 days after sowing (DAS) recorded significantly lower weed density (26.70/m^2), dry matter (37.23 g/m^2) and higher weed control efficiency (75.50%) as compared to farmers' practice (Pendimethalin 30% EC @ 3.25 l/ha + one hand weeding). The pre-emergent application of Pendimethalin 30% EC @ 3.25 l/ha followed by Post-emergent application of Oxyflurofen 23.5% EC @ 1.10 l/ha at 30 DAS was prove to be most productive and profitable weed control method which recorded significantly higher bulb yield (79.63q/ha), net return (Rs.1,06,169 /ha) and B: C ratio (2.50) as compared to farmers' practice bulb yield (63.88q/ha), net return (Rs.56,288/ha) and B: C ratio (1.72). The onion bulb yield was increased in herbicidal treatment to the tune of 24.66 % over farmers' practice.

EVALUATION OF CALCIUM NITRATE AND UREA AS A SUBSTITUTE OF CALCIUM AMMONIUM NITRATE (CAN) IN APPLE

L.K. Sharma, Pankaj Sood and D.S Yadav

Krishi Vigyan Kendra, Mandi, Himachal Pradesh
E-mail: lksharma72@rediffmail.com

ABSTRACT

Apple is one of the most important fruit crop of Himachal Pradesh and source of livelihood of the hill farmers. In Mandi district, apple is cultivated in an area of 16,800 ha mainly in Karsog, Seraj and Gohar blocks. Calcium Ammonium Nitrate (CAN) was the major source of nitrogenous fertilizers in apple crop, however in the recent years Govt. of India has stopped the production of CAN fertilizer and farmers were forced to use urea as source of nitrogen posing problems like acidic soil conditions. Though, Calcium nitrate has been available as substitute for CAN and has been recommended on Adhoc basis, but its specific recommendation was not standardized in the district. Henceforth KVK Mandi conducted an on farm trial with four treatments and five replications in different locations of Karsog block of Mandi district during the year 2018-19 and 2019-20 to assess calcium nitrate and urea as a substitute of CAN in apple. The treatments comprising of 50% N through Calcium nitrate (2.5 kg) +50% through urea (0.76 kg) +0.76 kg lime , 40% N through Calcium nitrate (2.0 kg) +60% through urea (0.91 kg) +0.91 kg lime, 20% N through Calcium nitrate (1.0 kg) +80% through urea (1.22 kg) +1.22 kg lime , 2.0 kg urea as a farmer practice (control). The data on growth, yield and quality parameters of apple was recorded during both the years of study. The results of the trial revealed that application of 20 per cent N through calcium nitrate (1.0 Kg) + 80 per cent N through urea (1.22 kg) + lime (1.22 kg) resulted in highest fruit yield (103.62 q/ha), annual shoot extension growth (38.77 cm) , fruit weight (139.55 g) , TSS 14.28 ^{o}B with highest BC ratio 2.92 which was closely followed by application of 40 per cent N through calcium nitrate (2.0 kg) + 60 per cent N through urea (0.91 kg) + lime (0.91 kg) but superior to the rest of treatments including farmers' practice.

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FIELD EFFICACY OF *TRICHODERMA VIRIDE* AGAINST *FUSARIUM* WILT OF CHICKPEA

Roop Singh*, Rakesh Kumar Bairwa, Irfan Khan[1], Kamla Mahajani[2] and Sarita

Krishi Vigyan Kendra, Kota (Rajasthan) 324001, [1]Krishi Vigyan Kendra, Chomu, Jaipur (Rajasthan) 303702, Krishi Vigyan Kendra, Bundi (Rajasthan) 323001
Email: roop0008@gmail.com

ABSTRACT

Chickpea (*Cicer arietinum* L.) is an important pulse crop in India. Wilt disease is the major limiting factor in chickpea production, incited by *Fusarium oxysporum* f.sp. *ciceri*is widespread in chickpea growing areas resulting considerable economic losses.Anon-farm trial was conducted at farmer's field to diminish*Fusarium* wilt of chickpea. The assessed practice of seed treatment with *Trichoderma viride*at 5 g/kg seed plus incorporation of *T.viride* at 5 kg/ha multiplied on decomposed FYM at 100 kg/ha at the time of sowing recorded minimum disease incidence7.85 per cent with maximum efficacy of disease control (76.13) as compared to farmers practices. There was 37.41 per cent more yield in assessed practices plots than farmers practices and the highest net return and benefit cost ratio was also obtained.

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FRONTLINE DEMONSTRATION ON WEED CONTROL IN KHARIF ONION

Swapnil Dubey, P. K. Dwivedi and Mukul Kumar

Krishi Vigyan Kendra, Raisen-464551 (M.P.) India
Email: swapnildubey45@yahoo.com

ABSTRACT

Weeds are the major problem in kharif onion crop due to slow germination, non branchy habitat and shallow root system. The front line demonstrations on established new molecules of weedicide for broad spectrum weed control were carried out at kharif onion at adopted village of Krishi Vigyan Kendra, Raisen in year 2017 and 2018. Among the many causes of low productivity onion exhibited greater susceptibility to weed competition as compare to other crops. Application of Oxyfluorfen as pre emergence @ 150 gm *a.i.*/ha. reduced the weed density and weed dry matter and significantly the highest growth attributes *viz.* plant height, Bulb weight and Bulb yield over farmers practice. Pre emergence application of Oxyfluorfen @ 150 gm *a.i.*/ha recorded high bulb yield (250 q/ha) as compare to F.P. (168.50 q/ha) and gave highest net return (Rs. 2,66,500) and Benefit Cost Ratio (8.96) over F.P. (Pre emergence application of Pendimethalin @ 1.0 liter a.i./ha).

GENOTYPIC DIFFERENCES IN PHOSPHORUS USE EFFICIENCY AND PERFORMANCE OF SOYBEAN GENOTYPES UNDER ADEQUATE AND DEFICIT PHOSPHORUS LEVELS

Anuradha Bhartiya[1], Asha Kumari[2], J. P. Aditya[1] R.S. Pal[1] and L. Kant[1]

[1]ICAR-Vivekananda Parvatiya Krishi Anusandhan Sansthan, Almora -263 601, Uttarakhand, [2]ICAR-Indian Agricultural Research Institute, Gauria Karma, Hazaribagh-825405, Jharkhand
Email: asha.sasrd@gmail.com

ABSTRACT

India is one of the major soybean (*Glycine max* L.) producing country in the world where low soil phosphorus (P) levels and its poor solubility adversely affect crop production. Keeping this point in view, the genetic variation for P use efficiency was asses in 42 soybean genotypes, which were grown to compare their performance in adequate and deficit P levels under field condition. Genotypes differed significantly for P use efficiency related parameters like grain yield, biological yield, 100 seed weight, root depth, shoot length, number of nodules, number of effective nodules, root dry matter weight, shoot dry matter weight, nodule dry matter weight and root:shoot ratio under both under both adequate and deficit P conditions. Based on the P utilization efficiency and mean grain yield levels, 14 soybean genotypes were found promising under low supplies of P. Categorization of soybean genotypes was also done under adequate and deficit P levels. On the basis of various parameters for P efficiency, genotypes were grouped into three (method I) and four (method II) categories as proposed by different researchers. Most genotypes behaved in a similar manner by different categorization methods under different P levels. Three genotypes NRC 37, JS 335 and VL Bhat 201 were found efficient as per the categorization done by method I as well as grouped as efficient and responsive genotypes by method II under both deficit and adequate P levels. The results shows that a large genetic potential exists in soybean genotypes for P use efficiency which can be utilised for improving the soybean production in the country in sustainable manner as well as to strengthen the soybean breeding programme for further development of P stress tolerant genotypes.

IMPACT OF INTEGRATED CROP MANAGEMENT ON YIELD AND ECONOMICS OF CLUSTERBEAN

Airadevi P. Angadi, Sudha S., M. R. Kammar, Venkanna B.,DineshKumar S. P. and S. C. Angadi

ICAR-KVK, Bagalkot-587101, University of Agricultural Sciences, Dharwad, Karnataka, India
Email: abhayaa9@gmail.com

ABSTRACT

The Study on impact of the front line demonstrations (FLD's) on Integrated management practices in clusterbean were conducted by ICAR-KrishiVigan Kendra of Bagalkot, Karnataka with an objective to assess the yield level of pusanavabahar with ICM practices over farmer practice and its economic impact. PusaNavbahar is a non branching variety, developed by crossisng Pusa Domausami and Pusa Sadabahar, pods smooth, light green pods with high yield and suitable for Kharif and summer. Integrated crop management practices were demonstrated in farmer's field for three consecutive years two years during *kharif* season from 2019-20 and 2020-21 to check the performance with over local variety. As an outcome of FLD, it was noticed that the demo variety (Pusa Navabahar) recorded average yield of 8.64t/ha with net return of Rs. 1,40,950as compared to farmers practice, which produced average yield of5.78t/ha with net return of Rs.72,200. The other parameters like extension gap, Technology gap and Technology index were derived for the assessment of technology adoption rate. The average extension gap, Technology gap and Technology index were 2.86, 0.36 and 4.0 per cent respectively. The average Benefit cost ratio was high in ICM in cluster bean (3.45) compared to farmer practice (2.62). On an average 33.10% yield increase was observe in demo plots over farmers practice. The results clearly showed the positive impact of front line demonstrations over farmer practice towards increasing the productivity of clusterbean in Bagalkote district of Karnataka. The improved technology in cowpea realized an additional income of Rs. 68,750/ ha over farmers' practice due to createdgreater awareness and convinced the other farmers to adopt the improved package of practices for clusterbean by following integrated crop management approach.

IMPACT OF IPM TECHNIQUES IN FLDS OF GRAM FOR ENHANCEMENT OF YIELD AND PROFITABILITY AMONG THE TRIBAL FARMERS OF BARWANI DISTRICT, MADHYA PRADESH

S.K. Badodiya[1]; Mukesh Sehgal[2] and D.K.Tiwari[3]

1. Principal Scientist & Head 2.Pr. Scientist and 3. PA
1, 3 RVSKVV, KVK Barwani (M.P.) and 2.NRCIPM New Delhi
E-mail : sbadodiya@gmail.com

ABSTRACT

Gram crop is best for health and income generation but the production of gram is decreasing day by day because farmers unaware of new technology. Krishi Vigyan Kendra was organized gram FLDs with IPM techniques successfully with an objective to demonstrate and popularize the improved agro-technology on farmers' field under varied existing farming situations. All 50 demonstrations in 20 ha area were conducted in 5 different villages and result concluded that increase average yield 18.75 q/ha in demonstration plot as compared to 12.80q/ha in control plot. There was 46.45 per cent increase in yield observed in demonstration plot over farmers practice. It was observed that potential yield can be achieved by imparting scientific knowledge to the farmers, providing the quality need based inputs and proper application of inputs. The average of total gross income under FLDs is Rs. 87964/ha. as against only Rs. 60303/- in the farmer practice. Net income obtained under FLD was only Rs. 51589/ha., and only Rs 28278/ha. of farmer practice respectively. KVK is playing most essential role in dissemination of technology through FLDs.

INTEGRATED NEMATODE MANAGEMENT STRATEGIES FOR PHYTONEMATODES

Archana U Singh

Division of Nematology, ICAR-IARI, New Delhi-110012
E-mail: arch_212@yahoo.com

ABSTRACT

Large number of plant parasitic nematode like Root-knot nematode (*Meloidogyne* spp.), Reniform nematode (*Rotylenchulus reniformis*), cyst nematode (*Heterodera* spp.), lesion (*Pratylenchus penetrans*) etc. are reported. They cause severe losses to economically important crops like vegetables, cereals, pulses, oilseeds, fruit crops, etc. But, farmers are not so aware of the damage caused by these nematodes in their crop in field. The degree of damage caused by nematodes depends upon population density of nematodes, environmental conditions such as soil fertility, moisture and also presence of other microorganisms i.e., fungi, bacteria and viruses. Hence, various management practices i.e., physical, chemical, cultural, biological, regulatory and IPM are under taken to minimize crop losses caused by nematodes. But, excessive use of pesticides in agriculture has played havoc in agro-ecosystem by polluting water, food chains and causing emergence of pesticide resistance both in target and non-target pests. A number of potential fungal bioagents namely *Aspergillus niger, Trichoderma viride, Sepedonium maheswarium, Paecilomyces lilacinus*, *Aspergillus terreus*, etc. effective in controlling root-knot nematode population. The combination of toxic and egg-parasitic fungus have been found more effective in controlling root-knot nematode population under microplot and field conditions in case of vegetables. Use of Chopped Toxic plants leaves along with judicious use of nematicide in integrated nematode management is an ecofriendly, efficient and affordable method of nematode control. Moreover, integrated nematode management approaches by the use of fungal bioagents, judicious use of nematicide and neem cake against *M. incognita* in case of pea, okra, tomato, brinjal, cucurbits, mungbean, chickpea etc., carried out in IARI & Farmer's field and found to be best in reducing nematode population and increasing crop yield. Thus, integration of various suitable methods may be an eco-friendly, economically viable and practically feasible approach for managing pests and diseases in different crops. Farmers with their available resources could follow integration of cultural, biological, chemical methods and resistant varieties in suitable combination for each crop and can get better crop yield.

IMPACT OF ON FARM TRIAL IN ADOPTION OF BIO-PESTICIDES AMONG BRINJAL GROWING FARMERS' IN MUZAFFARPUR DISTRICT OF BIHAR, INDIA

B.C. Anu, Arpita Nalia, M.L. Meena* and M.S. Kundu

Krishi Vigyan Kendra, Turki, Muzaffarpur (Bihar) 843121
Dr. Rajendra Prasad Central Agricultural University, Pusa, Samastipur (Bihar) 848125
*Email: mlmeenacazri@gmail.com

ABSTRACT

The present investigation was carried out during the year 2020-21 in Muzaffarpur district of Bihar to assess the adoption level of bio-pesticides by brinjal growers in brinjal production. Muzaffarpur district comprise of 9 blocks in which two blocks namely Bandra and Sakra were purposively selected. Four villages namely Tepri, Patsara from Bandra block and Machhai, Paigampurselected from Sakra block. From each selected village's 30 respondents were selected randomly, thus a total of 120 brinjal growers constituted the sample size for the study and data were collected by means of personal interview with the help of pre structured schedule. Through study, it was found that brinjal growers of selected areas were not having proper adoption of bio-pesticides in brinjal production. They had medium level of adoption to summer deep ploughing while they were having low level of adoption to soil treatment, seed treatment, foliage spray in standing crop, light/pheromone traps and bio-agents related practices regarding biopesticides. The results of the study revealed that the maximum number of respondents 87.90%, 85.70%, 72.90%, 79.50 % and 93.30% belonged from low level of adoption category about the soil treatment, seed treatment, foliage spray in standing crop, light trap and pheromone traps, bio-agents, respectively and 41.2% respondents found under the medium level of adoption about summer deep ploughing in measurement of fruit and shoot borer in brinjal production. Most of respondents 81.5%, 78.6% and 69.4% belonged from low level of adoption category about the foliage spray of botanical biopesticides in standing crop, light trap and pheromone traps and bio-agents, respectively. It was also found that 41.2% respondents found under the medium level of adoption about summer deep ploughing in measurement of jassid and white fly in brinjal production. It may be concluded that majority of the respondents belonged to low level category of adoption of different practices related to biopesticides and its application by brinjal growers in brinjal production for the measurements of fruit and shoot borer, jassid and white fly in brinjal production technology.

F21

INFLUENCE OF DIFFERENT CULTURAL MEDIA FOR MOST SUITABLE GROWTH OF S. SCLEROTIORUM

Anil Kumar Sharma and Rajni Singh Sasode

Department of Plant Pathology, College of Agriculture, RVSKVV, Gwalior, (M.P.) 474002, India.
E-mail: anilbohreabvp@gmail.com

ABSTRACT

Six artificial media were evaluated for their influence on the growth of S. Sclerotiorum and the data reveals that potato dextrose agar was found best because it showed maximum growth of the fungus (85.25 mm) followed by mixed meal agar (69.25 mm), Sorghum meal agar (65.75 mm), pearl millet meal agar (60.75 mm), pea meal agar (57.75 mm), at the stage of seventh day. While, corn meal agar was found comparatively less suitable as it showed the minimum growth of the fungus mycelium (51.50 mm). In all the tested media the growth of the fungus was initiated in the second day after inoculation. The trend of pathogen growth in all the media during 3rd to 7th day was almost similar. Potato dextrose agar medium was significantly superior over all the tested media.

F22

INTEGRATED NUTRIENT MANAGEMENT (INM) IN ONION FOR BETTER CROP PRODUCTIVITY AND IMPROVED SOIL HEALTH

Munish Sharma* and B.S. Khadda

Krishi Vigyan Kendra, S.A.S. Nagar (Mohali)
Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana, Punjab
Email: munish_uhf@yahoo.co.in

ABSTRACT

Onion is major *rabi* vegetable crop grown for its edible bulbs which are source of vital nutrients, vitamins and minerals. In Punjab farmers grow onion on a large scale and often use chemical fertilizers injudiciously to harness its maximum yield potential to make it viable commercially. But excessive use of these chemical fertilizers had adversely impacted soil health, environment and other natural resources including human health. Therefore it becomes mandatory to reduce the use of harmful chemical fertilizers. The present investigation was conducted to evaluate the effect of Integrated Nutrient Management (INM) in Onion for better crop productivity and improved soil health. The treatments comprised T_1: Non Judicious Use (Farmers Practice), T_2: Application of NPK: 40:20:20 Kg/acre along with 20 t FYM. T3: Combined application of 44:16:24:8 Kg/acre NPKS along with organic manures equivalent to 6 tonn FYM and Azospirillum and PSB @ 2 Kg each. The results revealed that T_3 provided highest yield (160 q/acre) with maximum BC ratio of 4.34 followed by T_2 (153.33 q/acre) with BC ratio of 3.93 and T_1 with yield of 143.67 q/acre and BC ratio of 3.55. Similar trends were observed for growth parameters. Combined application of 44:16:24:8 Kg/acre NPKS along with organic manures equivalent to 6 tonn FYM and Azospirillum and PSB @ 2 Kg each was found to be the best for sustainable production.

F23

INTEGRATED WEED MANAGEMENT IN SOYBEAN (*GLYCINE MAX*MERRIL L.)

Santosh Patel, G.S. Kulmi, R.K. Singh, Sanjeev Verma and Vinod Mittoliya

RVSKVV-Krishi Vigyan Kendra, Khagone (M.P.) 451001
Email: kvk.khargone@rvskvv.net

ABSTRACT

Soybean crop is heavily infested with narrow and broad-leaved weeds which causing 53% yield loss approximately in West Nimar district owing to compete the weeds for nutrients, moisture, space, sunlight and carbondioxide with soybean crop. Keeping in view two years (2020-2022) frontline demonstrations were conducted by Krishi Vigyan Kendra, Khargone in the adopted village.Results of two years frontline demonstrations revealed that higher values of branches/plant (7.35), pods/plant (36.72) and 100 seed weight (13.44 g) with minimum dry weed biomass (3.2 g/m^2) and higher weed control efficiency (92.25%) were observed under Quizalofop 5% @ 1.0 lt./ha + Chlorimuron ethyl 25% WP @ 37.5 g/ha at 20 DAS + 1 Kolpa at 30 DAS as compared to Imazethapyer10 SL@1.0 lt./ha as farmer practice.Quizalofop 5% @ 1.0 lt./ha + Chlorimuron ethyl 25% WP @ 37.5 g/ha at 20 DAS + 1 Kolpa at 30 DAS recorded maximum seed yield of 15.58 q/ha,net return of Rs. 37,578/ha and 3.14 benefit :cost ratio over farmer practice viz.,Imazethapyer 10 SL @1.0 lt./ha at 20 DAS.Farmers highly convinced with the Integrated Weed Management technology during Kharif season for soybean crop in West Nimardistrict of Madhya Pradesh.

F24

INTEGRATED WEED MANAGEMENT IN WHEAT (*TRITICUM AESTIVUM*L.)

Santosh Patel, G.S. Kulmi, R.K. Singh, Sanjeev Verma and Vinod Mittoliya

RVSKVV-Krishi Vigyan Kendra, Khagone (M.P.) 451001
Email: kvk.khargone@rvskvv.net

ABSTRACT

Wheat crop is heavily infested with narrow as well as broad leaved weeds which causing about 46% yield loss approximately in the crop. Keeping in view two years frontline demonstrations were conducted by Krishi Vigyan Kendra, Khargone in the adopted village. The results of two years frontline demonstrations indicate that Clodinofop propargyl 15% + Metsulfuron methyl 1% WP @ 400 g/ha at 30 DAS + 1 hand weeding at 45 DAS recorded highest values of panicle length (12.96 cm) and grains/panicle (84.61) with minimum weeds (4.85/m2) and weed dry biomass (2.85 g/m^2) over 2, 4 – D Na salt @ 1.0 lt./ha at 30 DAS. Clodinofop propargyl 15% + Metsulfuron methyl 1% WP @ 400 g/ha at 30 DAS + 1 hand weeding at 45 DAS gave highest grain yield of 55.37 q/ha, net profit of Rs. 85,303/ha and 4.38 benefit : cost ratio as compared to 2, 4 – D Na salt @ 1.0 lt./ha at 30 DAS (farmers practice). The farmers were convinced with the integrated weed management technology in wheat crop in Khargone district.

MANAGEMENT OF ROOT DISEASES THROUGH PROMISING BIO-CONTROL AGENT *TRICHODERMA HARZIANUM*

Sudha S., Airadevi P Angadi and Kammar M. R.

ICAR-Krishi Vigyan Kendra, Bagalkote-587101,UAS-Dharwad
Email: sudhas@uasd.in

ABSTRACT

Biological control of plant pathogens has become an integral component of plant disease management in light of the environmental and health issues attributed to the use of fungicides in agriculture. Successes in biological control using *Trichoderma* species, such as *Trichoderma harzianum, T. asperellum, T.polysporum* and *T. virens* against a variety of phytopathogenic fungi has increased the demand in the recent years. Bagalkote district has diversified cropping patterns among agricultural and horticultural crops and *T. harzianum* as bio-control agent has been used in different method of application such as soil application @ 7.5kg/ha, seed treatment @ 5-10g/kg, seedling treatment @ 5-10g/lit and foliar spray @ 5-10g/lit in agricultural crops like sugarcane, soybean, pigeonpea, chickpea and groundnut against major soil borne pathogens like *Fusarium*, *Macrophomina*, *Sclerotium* and horticultural crops like turmeric, pomegranate, banana, papaya, watermelon, guava and vegetable crops like onion, chilli, tomato and brinjal against pathogens like *Pythium*, *Fusarium*, *Macrophomina* and *Colletotrichum*. ICAR-Krishi Vigyan Kendra, Bagalkote at Biological Control Laboratory is involved in production of *Trichoderma harzianum* since 2011-12 to till date and made available to the farmers at reasonable rate (Rs.130/kg). Different extension activities to educate farmers on management of diseases using *T. harzianum* were carried out from the year 2011-12 to 2021-22. Teaching methods such as method demonstration in field (50), training (10), farmer-scientist interface (50), group discussion (60) and leaflets (5) were used to promote the technology in *viz*., Bagalkote, Bilgi, Hungund, Mudhol and Jamkhandi taluks of Bagalkote district which has benefited 50000 farmers. Ten years production of *T. harzianum* is 5314 kg which has generated income of Rs. 610910/- and the technology has spread in an area of 920 ha which benefited more than 1 lakh farmers witnessing disease reduction (wilt/root rots) in crops. Application of *T. harzianum* in field has contributed to Rs. 2000-8000 savings/ha. The use of *Trichoderma* as bio-control agent is essential to promote sustainable plant disease management.

MANAGEMENT OF SHEATH BLIGHT IN PADDY WITH NEW CHEMICALS IN SRIKAKULAM DISTRICT OF ANDHRA PRADESH

Chitti Babu G[1], Amara Jyothi P[2], Venkatarao P[3]Chinnam Naidu D[4,];

[1,2,4]Krishi Vigyan Kendra, Srikakulam,[4] DAATTC, Srikakulam,
Acharya N G Ranga Agricultural University
Email:g.chittibabu@angrau.ac.in

ABSTRACT

Paddy is an important food crop growing in Srikakulam District of Andhra Pradesh and cultivated in 2.0 lakh Ha. The paddy crop is affected by several biotic stress and of which sheath blight is an important disease which can cause losses upto 50% in Paddy yield. Sheath blight (ShB), caused by *Rhizoctoniasolani* Kuhn (Teleomorph: Thanatephoruscucumeris (Frank) Donk), is a destructive disease worldwide that causes significant yield loss and quality degradation. Though farmers are adopting chemical control measures against this disease, the disease is causing severe loss at early stage of the crop every year. In this situation, KVK Srikakulam has conducted an OFT on Sheath Blight management in Paddy to aware the farmers on new and efficient chemicals during 2020 and 2021. The recent new chemical, Azoxystrobin 11% + Tebuconazole 18.3% (T1) @ 1.5ml/l was efficient in decreasing the disease incidence and recorded 88.2% and 81% during 2020 and 2021, respectively, after one spray at maximum tillering stage. Trifloxystrobin 11% + Tebuconazole 75% (T2) @ 0.4g/l was also on par with T1 and recorded 82% and 75% during 2020 and 2021, respectively Whereas in the regular farmers practice (Propiconazole 11.4 % @ 1.0 ml/l) it was observed only 67% during 2020 and 65% during 2021. The yields were also recorded higher in the T1 compared to the farmer's practice. Farmers were also expressed the satisfaction towards the newer molecules in decreasing the disease incidence. The earlier scientific studies conducted by Bag et.al., 2016; Sivakumar et.al., 2019; Madhavi et al., 2021; Bhuvaneswari and Raju, 2012 was also stated that Azoxystrobin 11% + Tebuconazole 18.3% was effective in decreasing the sheath blight incidence in Paddy.

ROOT GRUB MANAGEMENT IN SUGARCANE THROUGH *METARHIZIUM ANISOPLIAE*

Sudha S., Dineshkumar, S. P and Kammar M. R.

ICAR-Krishi Vigyan Kendra, Bagalkote, UAS, Dharwad
Email: sudhapatho2081@gmail.com; sudhas@uasd.in

ABSTRACT

Sugarcane is the major crop of Bagalkote district which is cultivated in an area of more than 1 lakh hectare with potential yield 100 ton/ha. Sugarcane crop is mainly affected by root grub (*Holotrichia serrata*) a major concern of the sugarcane farmers' as it causes yield loss up to 40 per cent. Entomopathogenic fungi, *Metarhizium anisopliae* is used as bio-pesticide for the management of root grub which is a successful technology under field conditions is adopted by sugarcane farmers of the district. The recommended dose of application of *M. anisopliae* (5×10^{13} conidia/g) 12.5kg/ha+100kg of well decomposed farmyard manure (FYM)/ Vermicompost. Talc based *M. anisopliae* should be thoroughly mixed with FYM and incubated for 10 days under shade for multiplication of fungus, this enriched *M. anisopliae* should be applied in the field at the time of planting of sugarcane and in the initial stage of root grub life cycle (I and II Instar). Different extension activities to educate farmers on management of root grub through *M. anisopliae* carried out by ICAR- Krishi Vigyan Kendra, Bagalkote from the year 2013-14 to 2021-22. Front Line Demonstration (5), method demonstration in field (16), training (10), farmer-scientist interface (10), group discussion (20) diagnostic surveys (50)**,** campaigns (8), exhibitions (7) and leaflets (5) were used to promote the technology in sugarcane growing areas *viz*., Bagalkote, Bilgi, Mudhol and Jamkhandi taluks of Bagalkote district which has benefited sugarcane farmers. Since, the year 2013-14 to 2021-22, *M. anisopliae* is produced at Bio-control Laboratory, ICAR-KVK, Bagalkote and made available to the farmers reasonable rate (Rs. 250/kg). Till date the production is 4484 kg which has generated income of Rs. 1071900/- and the technology has spread in an area of 360 ha which benefited more than 50000 farmers which is direct impact. Application of *M. anisopliae* in field has contributed to increase in yield levels upto 35t/ha and Rs. 75000 savings/ha as additional income. Hence, biological control of root grub through *M. anisopliae* is eco-friendly and economically feasible strategy for the control of white grubs under field conditions.

F28

SCREENING OF CHILLI LINES AGAINST CERCOSPORA LEAF SPOT OF CHILLI INCITED BY *CERCOSPORACAPSICI*

Rajni Singh Sasode[1], Ekta Jarwal[1], andPramod Kumar

[1]Department of Plant Pathology, College of Agriculture, Rajmata VijayarajeScindia Krishi VishwaVidyalaya, Gwalior, Madhya Pradesh, India.
E-mail: rnikumujjain@gmail.com

ABSTRACT

Chilli is one of the most important vegetable as well as spice and cash crop of India, and belongs to the family *Solanaceae*. Chilli is a wonder crop because it has been used as food, spice and household medicine for several common problems such as high cholesterol, high blood pressure, pain to joint, skin problem, and used as carminative, appetizer, stomachic, beverages, relief of pain in neuropathy and counterirritant in treatment of rheumatism. (Singh and Fatehpuria 2020).Out of seven hybrids, none of hybrids were under resistant category against Cercospora leaf spot whereas three hybrids were moderately susceptible, while four hybrids were susceptible. The minimum intensity of Cercospora leaf spot diseases was recorded in hybrids Eagle (18.25%), followed by HVHP-279 (19.75%), Dhanlaxmi (23.75%), HYVEG-78 (26.75%), Chilli-hybrid 327 (34.50%), and Chilli local-1(38.25%) while maximum intensity was recorded in hybridsChilli local-2 (39.75%).

F29

STUDY OF INTEGRATED CROP MANAGEMENT PRACTICES OF BLACK GRAM WITH MOISTURE STRESS TOLERANCE VARIETY

Anil Kumar Singh, R.K.S. Tomar, Rajeev Singh Chauhan and Rahul Ojha

Krishi viugyan Kendra Datia (M.P.)
Email:- aksingh_kvk@rediffmail.com

ABSTRACT

Pulses are rich in proteins and are the second most important constituent of Indian diet after cereals. Among the different pulses, black gram is a rich source of protein which is one of the essential nutrients of the human diet. Black gram is an important short-duration, hardy, and stress-resistant legume crop of India grown in the Kharif season. Being a short-day plant, black gram is also sensitive to photoperiodic alterations. this crop suffers from several physiological drawbacks e.g., premature flower and pod abscission, poor pod set, etc. Hence, improvement in assimilate production along with a delay in senescence of reproductive parts are the major areas to be focused on regarding black gram cultivation. This experiment came to a conclusion that appropriate time of sowing along with heat tolerant variety and nutrient application has a great potential to achieve higher yield in black gram. Black gram reduction in Bundelkhand is largely rain fed and with increased frequencies of weather extremes, the use of heat tolerant varieties should be emphasized and promoted.

STUDY THE EFFECT OF DIFFERENT PESTICIDES TO CONTROL YELLOW VEIN MOSAIC DISEASE OF SOYBEAN CROP IN BURHANPUR DISTRICT (M.P.)

Kartikey Singh, S R K Singh, Monika Jaiswal, Sandip Kumar Singh & Bhupendra Singh

Krishi Vigyan Kendra, Burhanpur - 450331 (Madhay Pradesh)
Email: kartikey.malap@gmail.com

ABSTRACT

Yellow Mosaic Virus (YMV) is a serious disease of soybean. A field trial was conducted on farmer's field in Burhanpur district of Madhya Pradesh during 2016-18. To study the effect of different pesticides to control yellow vein mosaic disease of soybean as well as its effect on soybean crop growth and yield. On Farm Trial was carried out in simple RBD with three treatments and seven replications. For seed treatment insecticide like Imidachloprid 17.8% SL, Thiamethoxam 25% WG and Vitavax power were tested to find out their efficiency in controlling soybean yellow vein mosaic disease, as well as its effect on growth and yield of soybean. Insecticide like Imidachloprid 17.8% SL, Thiamethoxam 25% WG and fungicide vitavax power were applied as seed treatment @ 3 ml/gm/kg at the time of sowing. Soybean variety JS-335 was planted in first week of July, during the period with spacing of 45X5 cm in 3 cm deep line. Last population of infested plant (yellow vein mosaic disease) was found in Imidachloprid 17.8% SL treated plot and Thiamethoxam 25% WG were found significant over control during both the years. Data and yield attributes (yield & infested plants) also generated and found maximum number of plant under Imidachloprid 17.8% SL and Thiamethoxam 25% WG have higher number over control. Yield of soybean significantly increased over control in all treatments and maximum soybean yield was also found in Thiamethoxam 25% WG treatment followed by Imidachloprid 17.8% SL.

STUDY ON THE EFFECT OF 'POTASSIUM SALT OF ACTIVE PHOSPHOROUS'(PSAP) ON YIELD AND QUALITY CONTRIBUTING ATTRIBUTES OF SOYBEAN IN VERTISOLS AT DEWAS DISTRICT

Savita Kumari, Ashok Kumar Dixit and Manish Kumar

Krishi Vigyan Kendra, Dewas (Madhya Pradesh)
Email: savitachauhan.iari@gmail.com

ABSTRACT

Soybean (*Glycine max)* production and productivity are facing problems of imbalanced nutrition, scarcity of moisture as well as insect pest diseases infestation in the state. Generally the farmers are not given the emphasis of potassium nutrition in soybean crop. Keeping in mind, an experiment was made to examine the effect of potassium salt and active phosphorus on growth, yield and quality contributing parameters and insect pest and disease management in soybean crop during two consecutive years Kharif 2018-19 & 2019-20 on instructional form of KVK in district Dewas of Madhya Pradesh. The experiment comprises of 9 treatments i.e. RDF+plant protection measure**(T1),** RDF+plant protection measure+ PSAP @ 4gL^{-1}**(T2),**RDF+50 %plant protection measure**(T3),**RDF+50 %plant protection measure + PSAP @ 4gL^{-1}**(T4),**RDN+50 % P, K + plant protection measure**(T5),**RDN+50 % P, K & plant protection measure+ PSAP @4gL^{-1}**(T6),**RDN+50 % P, K + 50 %plant protection measure**(T7),**RDN+ 50 % P, K + 50 %plant protection measure +PASP @4gL^{-1}**(T8)** and RDN+PASP @ 4gL^{-1}**(T9)**. The experiment was carried out in alkaline nature of vertisols, with response crop of soybean variety JS-2034 followed randomized block design and replicated trice. The RDF @ N: P: K: S @ of 25: 60: 40: 40 were applied as basal dose at the time of sowing through straight fertilizers like urea, SSP, and MOP.The product potassium salt and active phosphorous (PSAP) was applied as a 1stsprayof PSAP @ 4gL^{-1},40 DAS at Pre-flowering stage,2ndspray at 55 DAS and 3rdSpray 70 DAS, simultaneously. The recorded data showed the maximum plant height (70.3cm) was observed in treatment no. 2(RDF+PPM+PSAP) while minimum (66.9 cm) in Treatment no. 9 (RDN and PSAP). The similar trends were also observed for no of pods per plant, no. of grain per plant, weight of grain per plant, yield per plot, respectively. The maximum yield 11.44 q/ha was recorded with application of PSAP along with RDF and plant protection measures while the minimum yield was noticed in case of PSAP application with RDN only.

MANAGEMENT OF GIRDLE BEETLE (*OBEROPSIS BREVIS*) THROUGH NEWER MOLECULES OF INSECTICIDES IN SOYBEAN

S. S. Sarangdevot, Shilpi Verma, P. S. Naruka, C. P. Pachauri and J.P.Singh

KVK, Neemuch
Email:acshilpi@gmail.com

ABSTRACT

Chemical control strategies remain the main tool in the suppression of soybean insect pest. In the past, defoliators were controlled using broad spectrum insecticides such as organochlorins, organophosphates, synthetic pyrathroids and carbamates. Overuse and reliance on these insecticides led to many documented cases of resistance of virtually all classes of insecticides. Today, insecticides applications are mainly limited to lepidopteran- specific compounds and newer chemistries of insecticides such as diamides. Presently the insecticides recommended for the control of defoliators are methomyl (carbamate), indoxacarb (oxadiazine), spinosad (spinosyn) and flubendiamide (diamide). It is known fact that these both lepidopteron defoliators showed certain levels of behavioral resistance to different class of insecticides, hence successful control of this pest is some extent difficult. Keeping this in view, study was under taken to test the effectiveness of some newer group of molecules against these pests in soybean. Field experiments were conducted during Kharif season of 2021-2022 to evaluate the efficacy of new molecule of insecticides i.e. Triazophos 40% EC, Thiacloprid 21.7% SC, Chlorantraniliprole 18.5% SC, and compared with untreated control plot against the Girdle Beetle, *Obereopsisbrevis Swed.* Among them, Thiacloprid 21.7% SC @ 750ml/ha was found as the best treatment against Girdle beetle followed by Chlorantraniliprole @ 150ml./ha. The highest yield of 16.18 q/ha, was recorded in the plot treated with Thiacloprid 21.7% SC. The lowest yield of 13.20 q/ha was recorded in untreated control. The C: B ratio of various insecticide treatments was calculated and the maximum C:B ratio (1:2.05) was recorded from Thiacloprid 21.7% SC treatment followed by Chlorantraniliprole 18.5% SC (1:81) and Triazophos 40% EC (1:1.55).

TECHNOLOGICAL DEMONSTRATION THROUGH INTRODUCTION OF NEW PEST RESISTANCE LINSEED VARIETY RLC-133 IN BALOD DISTRICT OF CHHATTISGARH

Sahu KR, Gaur AR and Sinha G

Indira Gandhi Krishi Vishwavidyalaya, Krishi Vigyan Kendra, Balod (Chhattisgarh)
Email: khoobi_ento@yahoo.co.in

ABSTRACT

Linseed (*Linum usittatum* L.) is annual oilseed crop which is grown for oil and fiber flex. Linseed is one of the most important industrial crops of India and stands next to rapeseed mustard in rabi oilseeds in area and production. Fruit is a capsule, globular in shape mostly indehiscent. Seeds are compressed shinning yellow or light brown. Seed contain oil ranging from 37 to 43 per cent. Linseed crop is attacked by a number of insect pests at various phases of its growth. Among which linseed bud fly, *Dasineura lini* Barnes causing 88 per cent grain yield losses and it is a key pest of linseed (Mukherji et al., 1999). Linseed variety RLC-133 was introduced in Balod district of Chhattisgarh through technological frontline demonstration by KVK, Balod in farmers field as well as KVK farm in the year 2020-21 and 2021-22. The recommended agronomic practices were followed. Incidence of linseed bud fly was observed on 5 randomly selected plants at field.

The incidence of bud fly was estimated by making count on the basis of number of damaged bud per plants and total number of healthy buds (per cent bud infestation were estimated). Linseed variety RLC-133 was found to tolerant for linseed bud fly and bud fly infestation recorded 11.08 and 12.42 per cent in RLC -133 during 2020-21 and 2021-21, respectively against 29.48 and 31.46 percent bud infestation in check variety Kiran. Based on bud fly infestation, the variety also recorded the highest yield (8.10 q/ha and 7.40 q/ha) which was 48.89 and 42.31 per cent higher average yield than the check variety Kiran with cost benefit ratio (1:2.01 and 1:2.26) in the year and 2020-21 and 2021-22 , respectively.

WATER REGIMES, TILLAGE AND WEED MANAGEMENT METHODS - EFFECTIVE TOOLS FOR TACKLE WEED MENACE UNDER WET LAND RICE ECOSYSTEM

Renjan B, Bindu, B and Anis Joseph R

Farming Systems Research Station, Sadanandapuram
Kerala Agricultural University
Email: renjan.b@kau.in

ABSTRACT

Optimal crop productivity realization in rice is hindered by several factors, of which weeds are recognized as the major biological constraint. The yield loss triggered by weeds resulted from their competition for growth factors, *viz.* nutrients, soil moisture, light, space, *etc.* In order to achieve higher benefits from applied inputs, weeds must be kept below economic threshold level through strategic management practices, which is gaining momentum under wet land ecosystems. Good land preparation, effective water management and use of herbicides are often considered as cost-effective alternatives to manual weeding. Field experiments were conducted during *Khari f*and *Rabi* seasons to study the effect of tillage, water regimes and weed management methods on weeds and transplanted rice. The design was split plot with combinations of tillage and water regimes as main plot treatments and weed management methods as subplot treatments. The weed management practices in the subplot treatments were: M_1-oxyflourfen 0.15 kg/ha *fb* HW at 20 DAT, M_2 - azimsulfuron 35 g/ha, M_3-(bispyribac sodium + metamifop) 70 g/ha, M_4 - fenoxaprop- *p*-ethyl 60 g/ha, M_5 - hand weeding twice at 20 and 40 DAT and M_6 - un weeded control. The *Rabi* crop was taken immediately after the *Kharif* without disturbing the field layout. The weed biomass was significantly reduced and the rice performance was superior under intensive tillage (three ploughings *fb* puddling), when compared to the conventional farmers' practice of land preparation. Among the water regimes, continuous deep water ponding (>7.5 cm water) either till panicle initiation or grain filling stage suppressed weed growth better than that under the recommended practice of maintaining about 5cm water level with intermittent drainage.

Technical Session : G

Marketing strategies for agricultural produce in India

G1

A CROSS-SECTIONAL SURVEY ON IMPACT OF LOCKDOWN DUE TO COVID-19 ON LIFESTYLE AND DIET PATTERN OF PEOPLE IN INDIA

Shilpi Verma, P. S. Naruka, S. S. Sarangdevot, C. P. Pachauri and J. P. Singh

Krishi Vigyan Kendra, Neemuch (Madhya Pradesh)
Email: acshilpi@gmail.com

ABSTRACT

The COVID-19 pandemic has already affected the human lifestyle, including our consumption patterns, especially during the lockdown period. This study aims to analyze the impact of COVID-19 and the lockdown on the dietary pattern of Indian consumers by performing a countrywide survey using a self-administered electronic questionnaire. The cross-sectional study was conducted using a validated, self administered electronic questionnaire distributed through emails and online social networking platforms from August 2020 to September 2020. The participants of the study were informed about the objective of the study. The questionnaire consisted of 19 questions and the survey form was prepared using the Google Forms application and was circulated through various electronic means. The study collected data from consumers all over the country, represented by all states and union territories.

A total of 375 individuals belonging to different states and union territories participated in the study. COVID-19 outbreak in India has altered the consumption pattern of the 70% of people who participated in the current survey. The primary reason behind the change was the non-availability of products transported from other geographical areas through various transportation methods. It is observed that 41.0% to 66.8% of the young adults changed their dietary intake patterns during the pandemic. Increased consumption in cereals and grains (88.5%), as well as oils and fats (90.6%), was positively associated with weight gain during the pandemic. On the contrary, an increased plain warm water intake (51.9) was observed during the lockdown. Findings also showed that 65.5% started practising Yogasana, Pranayama, meditation and consumed herbal tea / decoction (Kadha) distributed by Ministry of AYUSH intentionally because of COVID-19 or prepared at home and consumed as directed as advised by Ministry of AYUSH. During COVID-19 Pandemic, 92 % respondents reported to reduce the food wastage. Hence it can be concluded that the sudden imposition of lockdown and the subsequent shutdown during the initial phase affected consumer. It made people aware and concerned about their health. People also followed all the guidelines laid by the government.

CONSTRAINTS FACED BY CAPSICUM GROWERS IN CHATRA DISTRICT OF JHARKHAND.

Dharma Oraon, Ranjay Kumar Singh, V.K. Pandey, V.P. Rai, Upendra Kumar Singh, Zunaid Alam.

Krishi Vigyan Kendra, Chatra
Birsa Agricultural University, Ranchi.
E-mail : kvkchatra2012@gmail.com

ABSTRACT

The study was carried out during the year 2020-21 in Chatra district of Jharkhand. The Bio-Physical and Socio-economic condition of Chatra district is very favourable for growing capsicum as a cash crop. Extension agencies of the district are doing rigorous extension activities to disseminate improved cultivation practices of capsicum for doubling farmers' income, but the results are not satisfactory. Keeping this fact under consideration KVK Chatra tried to understand the constraint faced by farmers for not adopting the improved capsicum technologies so, that the extension strategy may be re designed. Gidhour and Simariya blocks of Chatra district were selected for the study where the maximum area was covered under capsicum purposively. A total of 110 capsicum growers were selected as respondent in the study. The result of the study depicted that the majority of the respondents (60%) belonged to lower middle age group ranging between 30-45 years. A maximum of 80% of respondents belonged to OBC class and most of them are literate. 82% of the respondents belonged to joint families and they were interested to grow capsicum with improved practices. 90% of the respondents had 01-02ha of land with mixed houses. Unavailability of micronutrient, fluctuation of prices, lack of knowledge about improved practices, Lack of credit as loans and granting of subsidies in remote areas of the district are the major constraints faced by the capsicum growers. The majority of the capsicum growers suggested that the government should provide solar motor pump for irrigation to reduce the cost of cultivation and improved varieties with micro and major nutrients should be available at local markets in rural areas.

G3

CONSTRAINTS FACED BY RURAL WOMEN IN ADOPTION OF NEW TECHNOLOGIES

S. H. Umrikar* And S. D. Somwanshi*

Krishi Vigyan Kendra, Badnapur, Jalna (M.S.) India
Email: rekhaup_2007@rediffmail.com

ABSTRACT

Many scientists in research schemes have designed and developed various technologies for the farm women to make their life easy. There are so many constraints in its use due to socio-economic bindings, situational or technological problems, they tend to reject the technology, discontinue its use or partially adopt it. Hence, the study was conducted to find out the various problems faced by rural women in adoption of selected new technologies. The study was conducted on 100 respondents (20 from each selected village) of five villages of Badnapur Tehsil, district Jalna. The data was collected through interview method in 2020-21. The major problems expressed by majority of the respondents were technologies were costly, habit of using traditional method, not easily available in market or hard to procure, difficulty in acquire perfect skill, unavailability of raw material, no training for its use, poor family income etc for its adoption.

G4

EMPOWERMENT OF FARM WOMEN THROUGH SELF HELP GROUP ACTIVITIES IN UDAIPUR DISTRICT OF RAJASTHAN

Abhilasha Gehlot- Ph.D. research scholar

Rajasthan College of Agriculture, Udaipur
E-mail : abhigehlot1995@gmail.com

ABSTRACT

A Self-help group (SHG) is a financial intermediary committee. It usually composed of 10-20 local women members. The research work was performed in Udaipur district of Rajasthan state. For this research among the 17 tehsils of Udaipur district Rishabhdev and Kherwara tehsil were selected as they are having highest number of SHG. We have selected 20 SHG from 2 selected tehsil and 6 farm women from each SHG. Thus, total 120 farm women were selected for proposed study. For data collection, the face to face interview technique was opted. The gathered data was refined, tabulated, analyzed and interference were made in accordance with objective. In the changing scenario over a period of time farm women are gradually realizing their own strengths and their roles in the society are expending over time. The role of women cannot be isolated from the total frame work of development. So, treating the women with equality of opportunities is very much required. We have to empower the women to change their dependency to interdependency which is a key for our national economic development.

MARKETING STRATEGIES FOR AGRICULTURAL PRODUCE IN INDIA

Sarla Meena

Ph.D Scholar, Department of Agricultural Economics and Management,
RCA, Udaipur-313001, Rajasthan.
E-mail : **sarlameena57@gmail.com**

ABSTRACT

India is an agriculture country and about 69% of its population directly or indirectly depends on agriculture sector. In spite of being most important sector it is facing lots of the problem. Farmers are still in down position to get benefits of their work. They are still not have any idea about how to sale?, how to get right price of their produce?, They don't know how to channelize their produce?, and if they face any losses then how to overcome from this?. They don't know the latest technologies. It is believed that poor linkages in the marketing channels and poor marketing infrastructure are leading to high and fluctuating consumer prices, and to only a small proportion of the consumer rupee reaching the farmers. Marketing strategies is a process that can allow an organization to concentrate its limited resources on the greatest opportunities to increase sales and achieved a sustainable competitive advantage. There are several elements of their marketing strategies such as – use of technology, increased competition, adherence to quality and compliance standards, empowering the farmers, market development, contract farming, improving infrastructure, and an effective regulatory environment. All in all, the marketing strategy creates a transparent and efficient market structure, gives importance to quality and variety, distributes market information to all the members, ensures fair returns, and offers producers choice of time, place and terms for sales. The new technology and increasing inputs are used by farmers, increases the price of inputs and output both. Consumers also expect the availability of goods at reasonable price. To achieve the above conflicting objective, effective marketing strategies can play crucial role. The proper development of effective agricultural marketing strategies will not only decrease the cost of distribution but also facilitate to various section of the population like farmers, traders, consumers, scientists, sociologists, administrators etc. It is also suggested that there is also a need for training/orientation/sensitization of food traders, including small wholesalers, retailers, and hawkers, on new technologies of packaging, sorting, quality maintenance, regulatory framework and related aspects of marketing.

STUDY ON THE AWARENESS ABOUT AGRI-ENTERPRISE ESTABLISHMENT BY RURAL YOUTH IN MORENA DISTRICT OF MADHYA PRADESH.

Dileep kumar Jatav, Shobhana Gupta and Hansraj Jatav

RVSKVV, Collage of Agriculture, Gwalior (M.P.)
Email- dileepkumard71@gmail.com

ABSTRACT

The term agri-entrepreneurship is similar to entrepreneurship in agriculture and describes agribusiness establishment in agriculture and allied sector. But a drop in landholdings (average 1.4 hectares), small and fragmented landholdings, a decreasing agricultural land versus a growing population, decreasing groundwater levels, poor quality of seeds, and lack of mechanization are some of the challenges for the growth of agriculture in India. And that's not enough, an absence of an organized marketing structure for produce, malpractices in the existing unorganized agricultural markets, inadequate facilities for transportation and storage, scarcity of credit, and limited access to superior technology are some of the many afflictions which obstruct the Indian agricultural sector. Morena District was purposefully selected as it has maximum number of rural youth in entire Chambal Division. Village wise list was prepared which were running the agri-enterprise with the help of RAEO and ATMA project officer. From the prepared list of villages, 10 villages (Hatipura, Nepari, Kirawalijadid, Rajpura jagir, Rithoniya, Antari, Dipera, Malibajana, Jarena, and Kurroli) were selected with the help of simple random sampling. In the final stage 10 rural youth from each village was picked up with the help of simple random sampling. Thus, the sample comprise of 100 rural youth as respondents**.** Agri-entrepreneurship has the prospect of social and economic development, for example, employment generation, poverty reduction, improvements in nutrition, health, and overall food security in the national economy, especially in rural areas. In the face of growing unemployment and poverty in rural areas, there is the urgency of entrepreneurship in agriculture for more productivity and profitability.

G7

TRAINING NEED ASSESSMENT OF AGRICULTURAL INPUT DEALERS IN TRANSFER OF AGRICULTURE TECHNOLOGY THROUGH DAESI PROGRAMME IN SURGUJA DISTRICT OF CHHATTISGARH

Rajni D. Agashe, Satish Kumar Verma AND D R Agashe

KVK Mahasamund (C.G.), KVK Balaghat (M.P.)
Email:rajniagashe@gmail.com

ABSTRACT

In rainfed faming state of Chhattisgarh, agro input dealers play vital role in farm production. Input dealers can contribute towards strengthening agriculture extension system through creation sound technological linkage with farmers. So, it is very essential to know the knowledge level of input dealers with modern crop production technologies including agro machinery. Present study was conducted during 2016-18 in Surguja district of Northern hill region of Chhattisgarh to prioritize need for training of agro-input dealers. Through personnel interview of 40 retailers, 47.5 % were young (36-45years), and 35 % were graduates. Training in computer and its application with record keeping software was another preferred area. Food crop rice, maize followed by mango as crop specific training needs.For dealers the major problems faced is the lack of knowledge of new product (90 %), Lack of knowledge of maintenance of stock (87.5 %), Non availability of bank loan (82.5 %), Fluctuation of selling season (80 %), Lack of capital and Need based training (77.5 %).

G8

LAND LEASE MARKET IN CENTRAL REGION OF PUNJAB

Rajjit Singh Brar, H.S. Kingra, Amit Guleria and Manjeet Kaur

Department of Economics and Sociology, PAU Ludhiana-141004
Email:amitguleria@pau.edu

ABSTRACT

The present study was undertaken to ascertain the regional variation in the leasing out land price in Punjab. Out of 23 total districts of Punjab , Jalandhar and Moga were selected and the data from 60 farmers each from each district was collected. Thus, total sample size comprised of 120 farmers for the study. The results revealed that the land prices in the Jalandhar district ranged between Rs. 1,00600/ha- to Rs. 1,06,060/ha- while in Moga it was between Rs. 1,32,400/-ha to Rs. 1,48,007/-ha among different farm size categories. The major reason behind this type of trend was extent of more migration in Jalandhar in comparison to Moga. Further, the leased in area in the Jalandhar was almost double as compared to Moga district. It was concluded that due to land market failure, around Rs. 50,000/ha economic loss faced by the farmers in this region. So, the government should take policy measure of fixation of minimum land rent to avoid these necessary losses to Punjab agriculture.

Technical Session : H

Organic approaches in soil health management

H1

ASSESSMENT OF KNOWLEDGE AND ADOPTION OF SOIL HEALTH CARD IN MALWA PLATEAU OF UJJAIN, MADHYA PRADESH.

Hansraj Jatav, Siddharth Namdeo, D K Suryawanshi, R P Sharma and D S Tomar

RVSKVV, KVK, Ujjain (M.P.)
Email-raj.hans14@gmail.com

ABSTRACT

India is on verge to improve the agricultural productivity while improving the soil quality and crop quality in a sustainable way. Deteriorating soil health has been a cause of concern and that has been leading to sub optimal utilization of farming resources, imbalanced use of fertilizers, low addition of organic matter and non-replacement of depleted micro and secondary nutrients over the years has resulted in nutrient deficiencies and decrease in soil fertility in some parts of the country. This study was conducted in Ujjain district of Madhya Pradesh. Krishi Vigyan Kendra, Ujjain. Intervention in all block like Training, Sangosty, FLD,OFT,FFS, Ex trainees meet Diagnostic visit, Field visit, Field day. During 2012-13 to 2016-17. Ujjain district comprises 6 block namely Ghatia, Tarana, Mahidpur,Barnagar,Ujjain & Khachrod each block 4 KVK Intervention village selected, 24 KVK intervention village were selected, 5 respondent each village were selected from study area. Thus, total 120 respondents were selected to constitute the sample of the study. The data were collected through personal interview methods with the help of structured schedule, which was pre tested also. The purpose of the data collection were fully explained to every respondent before they were asked to answer. The collected data were scored, tabulated and subjected to suitable statistical analysis.

Soil health card scheme launched by the government has the provision for providing soil health cards to farmers once in three year for their land holding which shall contain crucial information on macro and micro nutrients, secondary nutrient and physical parameters. The card shall also be accompanied by advisory on corrective measures a farmer should take for improved soil health and a better yield. It also allows for registration of collection of soil samples along with testing in approved labs. The benefit of the soil health card would provide an assessment about use of major fertilizers and making him aware of the missing nutrients and those which could be added for a balance soil.

COMPARATIVE EFFICACY OF DIFFERENT ORGANIC SOURCES OF NUTRIENTS IN FINGER MILLET UNDER RAINFED AND IRRIGATED ENVIRONMENT

Saurav Sharma*[1] , Pankaj Mittal[1] , Bheem Pareek[1] and Ranu Pathania[2]

[1]Krishi Vigyan Kendra Sirmour at Dhaulakuan, CSK HPKV Palampur, Himachal Pradesh
[2]Department of Agronomy COA CSKHPKV Palampur, Himachal Pradesh
Email: sauravsharma416@gmail.com

ABSTRACT

Millets are a group of small seeded species of cereal grains widely grown around the world and India having wide ecology geographical adaptability and resilience to various agro-climatic adversities hence; it is highly suited to drought condition and marginal land and requires low external input in cultivation. Millets require very little water for their cultivation as required by crops such as rice and sugarcane. In addition, Millets also not require any synthetic fertilizers and are completely pest-free crop as none of the millets attracts any pests. They are less susceptible to biotic and abiotic stresses. Thus, the production of millets is very economical for farmers because of almost less expenditure on irrigation, fertilizers, and pesticides. Importantly, seeds of most millets can be stored for longer period and are not affected by storage pests. Keeping in view above importance of millets a field experiment was conducted at KVK Sirmour to study the Comparative efficacy of different organic sources of nutrients in Finger Millet under rainfed and irrigated environment. The experiment consisted of eight treatments comprising of combination of four nutrient management treatments *viz.,* Ghanjeevarit, Ganjeevamrit + FYM, FYM and Control in two situations *i.e* rainfed and irrigated. Growth and yield attributes of finger millet were increased with Ghanjeevamrit under both the rainfed and irrigated situations and no significant effect of different environment was found on yield attributes and yield.

DEFINING AGRICULTURAL SYSTEM THROUGH NATURAL FARMING

Raghuraja J,Devaraja T.N., Mallikarjuna B.O and Basavanagowda M.G.,

ICAR-Taralabalu Krishi Vigyan Kendra, Davanagere (Karnataka)
Email: raghuraja92@yahoo.com

ABSTRACT

Even through natural farming is part of ancient agricultural system, in the recent part it took new dimension especially after Central Government took initiatives to promote natural farming. Mr. Raghava from Mallanayakanahalli, Harihara taluk, Davanagere district of Karnataka has started natural farming in his 8.4 ha land since 1996. The major crop the farmer growing is coconut alongwith vegetable, tubers, species, medicinal and aromatic crops, ornamental, fodders and agro-forestry with emphasis on bio-diversity. The data is collected from the farmer through personal interview method. The results reveals that average coconut per palm is 104, whereas net income increased from Rs. 90,292 to Rs. 98,048 and the cost of cultivation from Rs. 20,000 to 28000 compared to 2014 and 2020 respectively. The quality of farm produce from Mr. Raghava is well accepted by the consumers. Biodiversity and soil health condition is more emphasised in his natural farming. The farm produce is sold in Krishi Vigyan Kendra organised Saturday Organic Bazaar. Through various media the practice has reached more than 20000 farmers and 14 farmers adopting this unique farm practice.

EFFECT OF VARIETIES ORGANIC MANURES AND INORGANIC FERTILIZERS ON GROWTH, YIELD AND QUALITY OF OKRA (*ABELMOSCHUS ESCULENTUS*)

Usha Damar, R.K. Sharma, M. Upadhyay and J. Bhandari

Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, College of Horticulture,
Mandsaur-458002, Madhya Pradesh
Email:meghaupadhyay535@gmail.com

ABSTRACT

A field investigation was carried out during Rabi season, 2016-17 at Vegetable Research Field, College of Horticulture, Mandsaur, Madhya Pradesh. The experiment was comprised of two varieties (Kashi Pragati and Kashi Kranti) and seven nutrient levels with different sources of nutrients including organic fertilizers, inorganic fertilizers. Variety V_1 (Kashi Pragati) and nutrients level N_7 (50 % NPK + 50 % N through vermicompost) exhibited maximum plant height (80.69 cm and 83.05 cm), number of leaves per plant (16.34 and 17.01), number of branches per plant (5.30 and 6.12), internodal length (7.89 cm and 8.34 cm), SPAD value (63.66 and 66.92), fresh weight (164.85 g and 178.20 g) of plant and dry weight (40.81 g and 46.04 g) of plant, earliest days to 50% flowering (37.39 and 36.39 Days) and days to first picking (41.23 and 40.02). Similarly, maximum number of fruits per plant (16.09 and 18.21), fruit length (12.85 cm and 13.10 cm), fruit diameter (15.61 mm and 18.10 mm), fruit weight (11.67 g and 13.05 g), fruit yield per plant (189.17 g and 238.37 g) and fruit yield per hectare (140.11 q and 176.57 q) in variety Kashi Pragati and nutrients level N_7 (50 % NPK + 50 % N through vermicompost). Quality parameters i.e. protein content (12.84 % and 14.25 %) and fibre content (10.43 % and 9.34 %) in fruit were also found maximum in case of variety Kashi Pragati and nutrients level N_7 (50 % NPK + 50 % N through Vermicompost). The interaction effect of V_1N_7 (Kashi Pragati with application of 50 % NPK + 50 % N through vermicompost), showed highest value with respect to growth, yield, and quality parameters of okra. The gross income (194589.14 Rs.), net income (149504.14 Rs) and benefit: cost ratio (3.32) was found to be superior with (V_1N_7) variety Kashi Pragati and nutrient level 50 % NPK + 50 % N through vermicompost.

EVALUATION OF CONIDIOGENESIS AND BIOEFFICACY OF ENTOMOPATHOGENIC FUNGI, *BEAUVERIA BASSIANA* (BALSAMO) VUILLEMIN AND *METARHIZIUM ANISOPLIAE* (METSCHNIKOFF) SOROKIN ON VARIOUS SUBSTRATES

Anis Joseph.R, Bindu.B, Renjan.B

Farming systems Research Station, Sadanandapuram
Kerala Agricultural University
Email: anis.joseph@kau.in

ABSTRACT

The growing costs of conidia production have raised the need to ascertain the efficiency of some low cost substrates. Rice bran, Rice husk, Wheat bran, Coconut oil cake, Groundnut oil cake, Neem cake, Coir pith compost, Cow dung and Saw dust were used as substrates to determine their capability for maximum conidiation of the isolates. Conidiogenesis, sporulation and colony forming units in the different substrates were determined at monthly intervals. *B. bassiana* grew profusely in cow dung, neem cake, rice bran and wheat bran. Moderate growth was observed in the case of coconut oil cake and groundnut oil cake, where as in coir pith compost, saw dust and rice husk mycelial growth was only slight. The growth of *M. anisopliae* was high in cow dung, wheat bran and ground nut oil cake, moderate in neem cake and rice bran. Mycelium development was only slight in the case of coconut oil cake, coir pith compost, saw dust and rice husk. Estimation of spore count one month after storage revealed that the spore count was highest in cow dung (127.69×10^5 spores $m1^{-1}$) and this was significantly higher than in other substrates. The peak sporulation was observed in the samples drawn two months after storage. During this period the highest sporulation was noted in wheat bran which recorded a spore count of 11676.96×10^5 spores $m1^{-1}$ but this was on par with that observed in cow dung and both were significantly higher than that noted in other substrates. However, the conidiogenesis of *M. anisopliae* was much lower when compared to *B. bassiana*. The spore load in cow dung and wheat bran were 8573.66×10^5 and 8447.06×10^5 spores $m1^{-1}$, respectively. With respect to *M. anisopliae* also cow dung supported maximum cfu. Significantly superior counts were noted in cow dung during the first and third months after storage compared to other substrates, the cfu in cow dung during these months were 23.98×10^5 and 7.29×10^5 cfu g^{-1} respectively but during the second month after storage maximum cfu was noted in wheat bran. With respect to bioefficacy also, the fungi cultured in cow dung and wheat bran proved better. When sprayed with spore suspensions of *B. bassiana* cultured in cow dung and wheat bran and stored for one month, the mean mortality percentages of the adult weevil were 38.84 and 31.45, respectively at 14 DAT.

GIS INTERPOLATION IN ASSESSING EXTRACTABLE ARSENIC, PH AND ORGANIC CARBON IN SOILS OF NADIA DISTRICT OF WEST BENGAL, INDIA

Rahul Mishra[1,2], S.P. Datta[1], D. Golui[1], M.C. Meena[1], K.K. Bandyopadhyay[1], A. Bhatia[1] and A. K. Shukla[2]

[1]ICAR-Indian Agricultural Research Institute, New Delhi
[2]ICAR-Indian Institute of Soil Science, Bhopal
E-mail : mishrarahul471@gmail.com

ABSTRACT

As a class one carcinogen, arsenic (As) contamination in soil and water affects millions of people around the world. Arsenic contamination has been recorded in over 108 countries worldwide. For monitoring As accumulation, thorough soil sampling is necessary. However, it is challenging to monitor and map arsenic concentration across wide areas due to the time and financial costs associated. This research aimed to identify the most precise Geographic Information Systems (GIS) interpolation approach for mapping As accumulation across a local-scale study area in Nadia, West Bengal. We collected 201 georeferenced soil and rice grain samples for this investigation. Two interpolation techniques, Inverse Distance Weighted (IDW) and Ordinary Kriging (OK), were evaluated for accuracy. The obtained soil and grain samples were tested for pH, OC, extractable As and As concentration in rice grain. The average values for soil pH, OC, and Olsen extractable As were 7.56, 1.06 %, and 1.45 mg kg^{-1}, respectively. The amount of arsenic in rice grain was 0.43 mg kg^{-1}. Using root mean square error (RMSE) and mean CV matrix, the accuracy of the interpolation approach was assessed. IDW consistently produced the most accurate prediction of soil pH, OC, and arsenic content with RMSE values of 0.53, 0.30, and 0.23, respectively, and predicted minimum and maximum values are in close agreement with calculated minimum and maximum values. Co-Kriging predicted grain As content with better precision (RMSE = 0.09). However, the predicted minimum and maximum values were considerably higher than calculated. These interpolations helped to interpret the extent of As accumulation in the examined area. This study will guide future efforts by government agencies, industrial corporations, and local populations to comprehend the spatial distribution of arsenic contamination at various spatial scales.

IMPACT OF FRONTLINE DEMONSTRATION OF BIO FERTILIZERS ON YIELD OF MANGO AND SAPOTA IN NAVSARI DISTRICT OF GUJARAT

R A Gurjar*, K A Shah*, S R Salunkhe* and N M Chauhan**

Navsari Agricultural University, Navsari- 396450 (Gujarat)
*Scientist, Krishi Vigan Kendra, Navsari Agricultural University, Navsari- 396450 (Gujarat)
**Senior Scientist and Head, KVK, Navsari and Director of Extension, NAU, Navsari - 396450
Email: rashgurjar@gmail.com

ABSTRACT

To create awareness for use of bio fertilizers and the adoption of new input in mango var. Kesar and sapota var. Kalipatti demonstrations were conducted during the year 2019-20 in different blocks of Navsari district *viz*., Navsari, Jalalpore and Gandevi. Use of bio fertilizer in soil resulted in higher yield (93.50 and 128.00 q/ha) compared to check plots (85.00 and 112.00 q/ha) in mango and sapota fruit crops, respectively. The yield increase compared to check field plots was 10.00 and 14.29 % in mango and sapota crops, respectively. The extension gap was recorded in mango and sapota was 8.50 q/ha and 16.00 q/ha. Similarly, the technical gap was recorded 11.50 q/ha in mango and 22.00 q/ha in sapota. The technology index recorded 10.95 % in mango and 14.67 % in sapota. The benefit-cost ratio was recorded higher in the demonstrated plot of mango (3.59) and sapota (3.47) fruit crops compared to the check plot. Moreover, net return in mango was also recorded 11.99 % and 19.19 % in sapota.

IMPACT OF NATURAL, ORGANIC AND CHEMICAL FARMING ON SOIL ORGANIC CARBONSTATUS IN KIWIFRUIT (*ACTINIDIADELICIOSA* CV. ALLISON) ORCHARDS IN WESTERN HIMALAYAS

Ashok Kumar Garg and Rajesh Kaushal

Dr Y S Parmar University of Horticulture and Forestry, Solan, Himachal Pradesh, India-173230
Email: ashoksangrur@gmail.com

ABSTRACT

Recent years have seen a rise in consumer demand for organic products, as well as a true desire by orchardists to maintain crop output and soil health. A study was conducted on 6 years old kiwifruit vines cultivar 'Allison' at a spacing of 4.0 m × 6.0 m for two consecutive years 2018-19 and 2019-20 at experimental block of Department of Fruit Science, Dr YS Parmar University of Horticulture and Forestry, Nauni, Solan (HP). The experiment was laid out in triplicate in Randomized Block Design with 8 treatments under three farming systems *viz*., Chemical Fertilizer Based System (CFBS), Organic Farming Based System (OFBS) and Subhash Palekar's Natural Farming System (SPNFS). The eight treatments studied are: T_1 (Recommended dose of chemical fertilizers + 40 kg FYM) under CFBS, four treatments (T_2, T_3, T_4, and T_5) under OFBS where 100, 90, 80 and 70 per cent recommended dose of nitrogen was replaced with vermicompost and poultry manure on 50:50 basis along with 40 kg FYM, respectively and three treatments (T_6, T_7 and T_8) under SPNFS where 15, 22.5 and 30 liters of *jeevaamrit* + 3 kg of *ghana jeevaamrit* (each vine), respectively was applied along with 40 kg FYM each year.

In SPNFS, the improvement in SOC ranged from 10.9 to 21.2 and 7.6 to 19.2 per cent, respectively in surface and subsurface soil layers over chemical treatment. The SOC in surface 0-15 cm has also registered significant positive correlations with available N ($r = 0.890^{**}$ p value <0.01) and available P ($r = 0.687^{**}$ p value <0.01) of the soils. Therefore, environment friendly, organic and natural sources of agricultural inputs are desired for better soil health in terms of soil organic carbon. Maximum benefit: cost ratio of 12.36:1 was obtained in T_1 followed by 12.22:1 in T_8 treatment while organic treatment T_2 enumerated much lower benefit cost of 4.17:1 despite improvement in soil quality parameters and comparable yields.

ORGANIC FARMING – A BOON TO TRIBAL FARMERS

Sharmila Bharathi,C[1] and N.K.Sudeep Kumar*

ICAR – Krishi Vigyan Kendra
Directorate of Extension Education,
Tamil Nadu Veterinary and Animal Sciences University
Kalasamuthiram, V.Alambalam, Kallakurichi District -606 301 Tamil Nadu.
*Director of Extension Education, TANUVAS, Chennai-51
Email : csbkvk2007@yahoo.co.in

ABSTRACT

Kollihills is a small mountain range located at the tail end of the Eastern Ghats in Namakkal District of Tamil Nadu. Krishi Vigyan Kendra, Namakkal is being implemented Paramparaghat Krishi Vikas Yojana (PKVY) scheme at Elangiyampatti and Ariyur Nadu villages of Kollihills, Namakkal District, Tamil Nadu since 2019. Local group formed in the name of KVK Masila PKVY Farmers group with 21 tribal farmers covering in an area of 20 ha. The crops covered under organic farming are Black pepper, Cardamom, Hill banana, Coffee, Vegetables, Tapioca and Millets. Initially 12 capacity building programmes were conducted to the tribal farmers on organic farm management, organic input production for soil fertility management, adoption of PGS standards in field practices and PGS certification. The tribal farmers started organic cultivation by using vermicompost, panchakavya, IISR Tricho capsules, bio fertilizers and waste decomposer application produced by their own. They did primary processing of organic spices and plantation crops by using primary processing unit established by KVK under TSP scheme and maintained by these farmers group. After completion of 3 years organic farming practices, all the tribal farmers got organic certification. They harvested 1370 kg of black pepper, 145 kg of Cardamom, 1700 kg of coffee beans, 625 bunches of hill banana, 9.1 tonnes of vegetables and 1.4 tonnes of millets per 0.4 ha area and sold the organic produce with brand name to nearby markets in Namakkal, Salem, Karur and Erode. They realized a net income of Rs.3,01,500/- from black pepper,Rs.3,17,050/- from caradamom,Rs.93,700/- from coffee,Rs.1,55,400/- from hill banana,Rs.1,12,580/- and Rs.23,930/- from Millets each in an area of 0.4 ha.

IMPACT OF PKVY ON YIELD AND EXTENT OF ADOPTION OF ORGANIC FARMING PRACTICES AMONG THE FARMERS OF THE SIKAR DISTRICT OF RAJASTHAN

B.L. Asiwal, L.R. Balai, Mahesh Choudhary K.C. Nagar and Harphool Singh

BKVK, Fatehpur, (S.K.N. Agriculture University, Jobner)
Email:asiwalbl@gmail.com

ABSTRACT

Prampragat Krishi Vikas Yojana (PKVY) is a holistic production management approach through which organic farming promote and enhances agro-ecosystem health, including biodiversity and soil biological activity. PKVY was launched in April, 2015 to support & promote organic farming to encourage the farmers to adopt eco-friendly concept of cultivation and reduce their dependency on fertilizers and agriculture chemicals to improve yields. The main problem with organic production is the certification and certification standards. This study was carried out by Krishi Vigyan Kendra (KVK), Fatehpur-Sikar in two adopted villages namely Athwas & Bhairunpura of Laxmangarh Block under PKVY scheme.

Total 40 beneficiaries' farmers of PKVY were selected from both villages during 2018-19 to 2019-20. The significant change (75.00%) in knowledge level of PKVY farmers were found about vermin-compost preparation followed by preparation & use of Neem bio-pesticide (62.5%), Seed treatment with Bija-amrit (55.00%), Recommended Seed rate @100 $kgha^{-1}$(47.50%), Improved variety (45.00%). The economic findings of the study show that grain yield of wheat crop were obtained 35.50 and 36.20 qtl/ha under demonstration plot of PKVY which were (-)7.55 & (-) 6.70% decrease as compare to farmer's practices during 2018-19 and 2019-20, respectively. But due to its organic quality sale income & net profit were obtained approximately Rs.5000/- & Rs.3000/- ha more in case of PKVY demonstration as compare to farmer's practices during both years, respectively. The beneficiary farmers of PKVY also play an important role as a source of information to other nearby farmers. It shows positive direction of organic farming because farmers can gain more profit or net profit due to low yield by sale their produce on high price as organic.

ORGANIC SOIL HEALTH MANAGEMENT PRACTICES ENHANCE SUSTAINABILITY IN BRINJAL PRODUCTION

T R Sahoo, S Sethy, D R Sarangi, R K Mohanta and D Jena

KVK Cuttack, ICAR- National Rice Research Institute, Cuttack, Odisha-753006
E-mail: tusarranjan95@gmail.com

ABSTRACT

Healthy soil means rich microbial diversity in the soil ecosystem. The healthy soil in farmers field is need of the hour for sustainable production of crops through organic inputs. The present study was based on the production of Brinjal through organic inputs under PKVY during 2019-20. The Farmers in tribal belts of Cuttack district were selected for this purpose. They usually prefer cultivation of Brinjal of their local land races (jeypore local) as the variety can withstand drought and produce yield for longer duration than others. That variety is popular in Cuttack district for its high-quality taste and post-harvest life. An experiment was carried out to study the effect of different organic management practices in an integrated regime that could support Brinjal production in tribal belts during 2019-20. The experiment was designed with 5 treatments *viz*. T1: Farmers Practice: Only FYM-10q/ha+ Neem Cake (50 kg/ha), T2:FYM-10q/ha+ Neem Cake (50 kg/ha)+ Trichoderma viride (1250 ml/ha), T3: FYM-10q/ha+ Neem Cake (50 kg/ha) + Trichoderma viride (1250 ml/ha) + BIONPK Consortia (1250 ml/ha), T4: FYM-10q/ha+ Neem Cake (50 kg/ha) + Trichoderma viride (1250 ml/ha) + BIONPK Consortia (1250 ml/ha) + Mycorrhiza (2.5 kg/ha), T5: FYM-10q/ha+ Neem Cake (50 kg/ha) + Trichoderma viride (1250 ml/ha) + BIONPK Consortia (1250 ml/ha) + Mycorrhiza (2.5 kg/ha) + Organic compound mixture (1250 ml/ha) were replicated in 4 farmers' field. It was observed that FYM and Neem cake applied during last ploughing combined with basal application of BIONPK Consortia, Mycorrhiza and Organic compound mixture in root zone was found to be the best in obtaining high quality fruit and higher yield per acre in the farmer's field. The results of using these organic practices resulted in 72% less pest infestation in plants, 66% more fruits per plant, and 43% more yield per hectare than Farmers practices. The present study clearly demonstrates that integrating management of organic inputs to ensure good soil health is the best approach to improve Brinjal production.

OUTCOME OF LIQUID BIOFERTILIZER APPLICATION AND FARMERS' PREFERENCES ON ACCEPTANCE AND ADOPTION OF TRADITIONAL RICE PRODUCTION UNDER ORGANIC FARMING -A CASE STUDY

Dhanushkodi V and Tamilselvan N

ICAR-Krishi Vigyan Kendra, Sirugamani-639 115,
Tiruchirappalli, Tamil Nadu, India
Email:dhanushselgi@yahoo.com.au

ABSTRACTS

To promote organic farming, TNAU released liquid *biofertilizers* viz., *Azospirillum, Phosphate solubilizing bacteria, K Solubilizer, Zn solubilizers, PPFM application* and Krishi Vgiyan Kendra, Tiruchirappalli conducted a field demonstrations and awareness programmes during 2020-21 at B. Mettur village in Uppliyapuram block, Tiruchirappalli district, which is located under the foothills of Kollihills with a view to prove their effect on traditional rice yield and income of farmers. The applications of liquid biofertilizers positively increased more productive tillers (13-17.1 numbers), additional grain yield (12-18%) and straw yield (15-22%) in five traditional rice varieties: Karuppu kavuni (3225 kg/ha), Sigappu kavuni (3280 kg/ha), Kothamalli samba (3750kg/ha), Kattuyanam (2850kg/ha), Garudan samba (2550 kg/ha), Mapillai samba (2450 kg/ha), Thooyamalli (3950 kg/ha). It was observed wide variations in grain yield (2450-3950 kg/ha) and durations (80 to 180 days duration) according to varieties. Further primary data was collected during 2021 by using a standard structured questionnaire administered through face-to-face interviews to find out the reasons for adoption of traditional paddy varieties under organic farming. The majority of the respondents indicated that organic farming grants effective utilization of natural resources for income generation (95%) followed by nutritional security (88%). Farmers expressed traditional rice are being used by traditional healers and local farmers in ayurveda for curing various kinds of health issues and helpful in treatments such as improving immunity, strengthen bone, curing stroke and joint pain, reduce risk from diabetics and high blood pressure and skin disease, protect from cancer and kidney problem and improve digestion capacity as they are abundant in antioxidants, antiviral properties, vitamins and minerals etc.,. Besides, traditional paddy varieties like Karuppu kavuni, Poongar, Kullankar and Kattuyanam are resistant to biotic and abiotic stress. Thus, more focus on special features of traditional rice is to be scientifically studied to not only save it from becoming extinct but also lead a step forward towards the nutrition security of the country.

PINEAPPLE (*ANANAS COMOSUS* L.): A LOW INPUT AND HIGH QUALITY FRUIT CROP ORGANIC PRODUCTION IN TRIBAL AREA UNDER SATPURA PLATEAU REGION OF DISTRICT CHHINDWARA MADHYA PRADESH

R. K. Jhade*, R. C. Sharma, P. L. Ambulkar, D. C. Shrivastava and S. K. Ahirwar

*Jawaharlal Nehru Krishi Vishwa Vidyalaya, KVK-II, Delakhari, Tamia, Chhindwara, Madhya Pradesh, India-480 559
Email: jhaderk49@gmail.com

ABSTRACT

Pineapple is one of the most popular fruit crops of the tropics and it is the most representative plant in the family Bromeliaceae. Pineapple is highly valued because of its excellence in canning and other processing industries for the production of nutritious and value added products like juice, jam, jelly, candy, canned pineapple squash etc. and is good source of vitamin A, B and is rich C and calcium. This fruit is a rich source of phenolic compounds (flavonoids, carotenoids, and hydroxycinnamic acids) and is traditionally employed in dietary formulations for the prevention and management of cardiovascular and neurodegenerative diseases. Block- Tamia at district Chhindwara is by default Organic in nature. Fruit farming generally involves high levels of chemical inputs despite the fact that consumers are increasingly concerned about the sanitary and organoleptic aspects of fruit quality. However, A demonstration was conducted in the year 2020 with introduction of new crop Pineapple (propagated with slips) on organic performance of pineapple fruit crop in tribal area and new climatic region at new established additional KVK-II, Delakhari, Tamia dist. Chhindwara. Use local organic fertilizers in the demonstration without pesticide and herbicides and it was found to be most suitable and successful cultivation under this climatic conditions considering ideal yields, good fruit quality and relatively higher crown or due to very less disease and pest incidence under agro-climatic conditions.

PRODUCTION OF ORGANIC INPUTS BY TRANSGENDER FOR THEIR LIVELIHOOD SECURITY IN TIRUCHIRAPPALLI DISTRICT

Dhanushkodi V and Tamilselvan N

ICAR-Krishi Vigyan Kendra, Sirugamani-639 115,
Tiruchirappalli, Tamil Nadu, India
Email:dhanushselgi@yahoo.com.au

ABSTRACT

Transgender peoples have different gender identities at birth. Recently, there was a turning point when this community got recognition as a 'third gender'. To ensure societal acceptance and dignity for trans people in the community, several welfare schemes have been initiated by the governments. Krishi Vigyan Kendra is a district level knowledge centre and which acts as the apex body to govern the Transfer of Technology (TOT) across the nation. One of the mandates of such district level knowledge centre is to provide vocational training to the farming individuals' viz. farmer, farm women, rural youths, unemployed school drop-outs etc. During 2020, 16 members from SAFE Transgender Association, Tiruchirappalli approached KVK Tiruchirappalli and underwent vocational training on Organic input production technologies. With the technical guidance of KVK they started one unit of vermicompost of size 12 x 4 x 2 feet and fish oil preparation in one unit with 50 lit capacity during 2020. During 2021, they gradually expanded their unit for medicinal plant production with available organic inputs and Panchagavya preparation. They producing 4 tonne vemicompost, 100 lit fish oil, 100 lit panchagavya and 1000 medicinal plants with a net income of Rs. 1,26,000/ annum. After getting the expected momentum, they started to supply biofertilizers to the urban population. Besides they are involved in establishing kitchen garden and gardening in college and schools. vermicomposting, panchgavya and fish oil technology is a simple and quick process of converting farm waste into valuable nutrient sources which in-turn acts as a source of the organic amendment for improving soil health and enhancing crop production. Medicinal plants are now become very popular and well accepted by all. The transgender can learn the organic input production technologies through hands on training and take-up this as a venture for additional income generation and make this one of the sustainable systems for creating employment. The scientific validation of the study revealed that the transgender group was earning a additional net annual income of Rs. 1,26,000/- through the sale of vermicompost, panchagavya, medicinal plant, fish oil and bio fertilizer, thereby generating an additional employment of 1400 man-days/year.

PROMOTION OF LIQUID BIO INOCULANTS FOR ENHANCING RICE PRODUCTIVITY THROUGH KVK INTERVENTIONS

Noorjehan A.K.A.Hanif[1], Dr.J.Ejilane[2], V.Dhanushkodi[3] and G.Balasubramanian[4]

Tamil Nadu Agricultural University
1 & 4 – Agricultural College & Research Institute, Karur (TNAU)
2 – Agricultural College & Research Institute, Thanjavur district (TNAU), Tamil Nadu
3 - ICAR Krishi Vigyan Kendra, (TNAU), Sirugamani, - 639 115, Tiruchirappalli district,
Email: noorjehan@tnau.ac.in

ABSTRACT

In Tiruchirappalli District of Tamil Nadu, rice forms the staple crop among the farmers of along Cauvery delta region in an area of 55000 ha but the farmers fail to achieve high productivity due to lesser knowledge on bio fertilizers and its methods of application. Use of microbial inoculants at different stages of rice crop will provide required nutrients for the growth of rice crop and can able to protect the crop from pest and diseases without harming the natural ecosystems. These inoculants also enhance the rhizosphere of crops and thereby improve the soil health in turn. Through Krishi Vigyan Kendra (KVK) interventions like conduct of trainings to farmers (15 no.s), trainings to Extension officials (4 no.s), field days (3 no.s), focus group meetings and disseminated stage specific bio inoculants application in rice for getting higher yield. Conducted frontline demonstrations (FLD) in ten locations in three villages *viz.,* Sirugamani in Andanallur block, Thottiyam village & block and doubling farmer's income village Sevanthalingapuram in Musisri block during Samba season 2019. Bio inoculants were applied as Stage I: Seed treatment for nursery: *Azotobacte*r; *Bacillus* and *Pseudomonas* inoculation in the nursery bed before sowing the seeds; Stage II: 15-20 days after transplanting: *Azospirillum*, *Pseudomonas* and *Phosphobacteria* application through soil drenching; Stage III: 40-45 days after transplanting: Application of *Phosphobacteria* through soil drenching and PPFM spray; Stage IV: 60-75 days after transplanting: Application of potassium (K) releasing bacteria through soil drenching and PPFM spray. The study resulted in increase of yield by 15%; straw yield by 11%; chaffiness reduced by 99%; lodging reduced by 95%; more of grain boldness and shininess and good grain filling. This noval technology reached to 451 farmers from 2019 to 2021 through KVK interventions**.**

H16

SUGARCANE TRASH DECOMPOSITION THROUGH *INSITU* VERMICULTURING IN BIDAR DISTRICT OF KARNATAKA

Sunilkumar N.M, Akshaykumar, Rakesh Varma, And Ningdalli Mallikarjun

Krishi Vigyan Kendra, Bidar-585402, Karnataka (India)
Email:kvkbidar2013@gmail.com

ABSTRACT

Sugarcane trash are also disposed off simply by burning in the field by farmers which results in loss of nutrients, soil health and causes atmospheric pollution due to the emission of toxic gases. So releases of the earthworms (Eudrilus eugeniae) species to decompose is one of the best organic approach with low investment which results in recycling of sugarcane trash using earthworms and reduced cost on fertilizers/ pesticides and to give eco friendly technology to sugarcane growers. This is research was conducted in farmers field on ratoon crop in an area of 1 acre for each treatment, total 5 treatments were taken up for this research among which POP + release of 25kg earthworms per ha was found to be the most effective treatment in converting sugarcane trash into valuable vermicomposting at harvesting (90.9%) followed by the treatment POP + release of 12.5kg earth worms per ha resulted in conversion of (70.6%) at the time of harvesting.

H17

SULPHUR AND BORON FERTILIZATION ON YIELD AND ECONOMICS OF RAPESEED AND MUSTARD

R.K Tiwari, Sanjay Kumar, Bharati Upadhaya and Vidyapati Choudhary

Dr. Rajendra Prasad Central Agricultural University, Pusa, Bihar
Email: head.kvk.birauli@rpcau.ac.in

ABSTRACT

For oilseeds, sulphur and boron are most vital nutrients for the growth and development. On Farm Trial was conducted for two years during *Rabi* season of 2019-20 and 2020-21 by Krishi Vigyan Kendra, Birauli in Samastipur, Bihar to quantify the effects of sulphur and boron application on yield and economics of rapeseed and mustard. Randomized Block Design was followed with five replications to study the trial. Five technological options were used during the study *viz.,* $T.O_1$: basal application of sulphur @ 30 kg/ ha, $T.O_2$: basal application of boron @ 15 kg/ha, $T.O_3$: basal application of boron @ 15 kg/ha and sulphur @ 30 kg/ha in combination and Farmer's practice (control): No sulphur and boron application. Mean results over the two years indicated that yield and economics were significantly affected by sulphur and boron fertilization as basal dose in rapeseed and mustard. Significantly higher yield (16.74 q/ha) was obtained in $T.O_3$ *i.e.,* combined application of boron @ 15 kg/ha and sulphur @ 30 kg/ha over rest of the treatments. Similarly, gross returns, net returns and benefit-cost ratio were significantly higher in $T.O_3$ *viz.*, Rs. 58,590.00/ha, Rs. 36,630/ha and 2.60, respectively over rest of the treatments.

Technical Session : J

Integrated farming system for rural development.

J1

IMPACT OF ON FARM TRIAL IN ADOPTION OF BIO-PESTICIDES AMONG BRINJAL GROWING FARMERS' IN MUZAFFARPUR DISTRICT OF BIHAR

B.C. Anu, Arpita Nalia, M.L. Meena* and M.S. Kundu

Krishi Vigyan Kendra, Turki, Muzaffarpur (Bihar) 843121
Dr. Rajendra Prasad Central Agricultural University, Pusa, Samastipur (Bihar) 848125
*Email: mlmeenacazri@gmail.com

ABSTRACT

The present investigation was carried out during the year 2020-21 in Muzaffarpur district of Bihar to assess the adoption level of bio-pesticides by brinjal growers in brinjal production. Muzaffarpur district comprise of 9 blocks in which two blocks namely Bandra and Sakra were purposively selected. Four villages namely Tepri, Patsara from Bandra block and Machhai, Paigampur selected from Sakra block. From each selected village, 30 respondents were selected randomly, thus a total of 120 brinjal growers constituted the sample size for the study and data were collected by means of personal interview with the help of pre structured schedule. Findings have shown large gap between recommendation and adoption in respect to bio-pesticides. The results of the study revealed that the maximum number of respondents 87.90%, 85.70%, 72.90%, 79.50 % and 93.30% belonged from low level of adoption category about the soil treatment, seed treatment, foliage spray in standing crop, light trap and pheromone traps, bio-agents, respectively and 41.2% respondents found under the medium level of adoption about summer deep ploughing in measurement of fruit and shoot borer in brinjal production. The results also revealed that most of respondents 81.5%, 78.6% and 69.4% belonged from low level of adoption category about the foliage spray of botanical biopesticides in standing crop, light trap and pheromone traps and bio-agents, respectively. It was also found that 41.2% respondents found under the medium level of adoption about summer deep ploughing in measurement of jassid and white fly in brinjal production. It may be concluded that majority of the respondents belonged to low level category of adoption of different practices related to biopesticides and its application by brinjal growers in brinjal production for the measurements of fruit and shoot borer, jassid and white fly in brinjal production technology. Therefore, there is an urgent need of skill-oriented training, field day, Kisan Gosthi, Farmer Scientist Interaction of brinjal growing farmers for higher brinjal production.

J2

INTEGRATED FARMING SYSTEM FOR SUSTAINABLE FARM INCOME- A CASE STUDY

Devaraja T.N., Mallikarjuna B.O., Basavanagowda M.G and Raghuraja J

ICAR-Taralabalu Krishi Vigyan Kendra, Davanagere (Karnataka)
Email:tngdevaraja@gmail.com

ABSTRACT

Mr. Dyamappa H.M. from Halavarthy village of Davanagere district, Karnataka practicing integrated farming system since 20 years. He is growing maize, rice, potato, rose, arecanut, dairying and aquaculture. The data were collected through personal interview method. The results revealed that gross income of farmer from 6 ha. land increased from Rs. 40,15,125/- to Rs. 75,12,212/- and net income increased from Rs. 30,87,916/- to Rs. 62,37,932/- (102.01 %) compared to 2016-17 and 2020-21, respectively. With the interventions of Krishi Vigyan Kendra, the farmer produced dry seeded, rice, potato and dairy and fish rearing enterprises which resulted in net income of Rs. 62,100/-, 150,050/-, 4,39,050/- and 93,700/-, respectively.

J3

PRODUCTIVITY AND ECONOMICS OF SOYBEAN-WHEAT CROPPING SYSTEM UNDER DIFFERENT LEVELS OF NPK

V. K. Singh, I. S. Tomar, Jagdish Morya and Chandan Kumar

Krishi Vigyan Kendra, R.V.S.K.V.V., Jhabua Madhay Pradesh. India
Email: vinaysoil@yahoo.com

ABSTRACT

The application of recommended doses of NPK (T_5) exhibited their superiority by recording higher grain yield of both soybean and wheat crops over rest of the treatments during both years of study. The recommended doses of NPK (T_5) increased the soybean yield over control (T_1) by 71.2 % and 48.6 % in 2019-20 and 2020-21, respectively and wheat by 35.2 % and 33.9 % in 2019-20 and 2020-21, respectively. The mean wheat equivalent yield (WEY) was the highest (57.9 q/ha) with the application of recommended doses of NPK (T_5) in both soybean and wheat crops followed by T_3 (52.1 q/ha), T_4 (48.5 q/ha), T2 (45.4 q/ha) and the lowest in T_1 (40.5 q/ha). Similarly, the highest NMR of Rs. 35475/ha and Rs. 50978/ha during 2019-20 and 2020-21 was recorded with application of recommended doses of NPK (T_5). The mean NMR per rupee invested (B:C) was higher (1.55) when crops were fertilized with recommended doses of NPK (T_5) and the lowest (1.16) was recorded when no fertilizers were applied to both the crops (T_1). Additional investment of Rs. 4854/ha in T_5 treatment, exhibited the additional NMR of Rs. 16567/ha over control (T_1). So the judicious use of money in right direction can pay positive results in terms of yield as well as additional NMR/ha.

Technical Session : K

Technological innovation in Hi-tech horticulture.

K1

A STEP TO PINEAPPLE (*ANANAS COMOSUS* L.) PRODUCTION IN TRIBAL AREA UNDER SATPURA PLATEAU REGION OF DISTRICT CHHINDWARA MADHYA PRADESH

R. K. Jhade*[1], Surendra Pannase[2], T. R. Sharma[3] and Vijay Verma[4]

*Jawaharlal Nehru Krishi Vishwa Vidyalaya, KVK-II, Delakhari, Tamia, Chhindwara, Madhya Pradesh, India-480 559
Email: jhaderk49@gmail.com

ABSTRACT

*P*ineapple (*Ananas comosus* (L.) Merr.) (*Bahunetraphalam* in Sanskrit) is one of the most popular fruit crops of the tropics. It is found in many states in India, including Kerala, Bihar, West Bengal, Karnataka, Goa, Assam and Maharashtra. The juice has worldwide market. Pineapple is one of the choicest fruit all over the world because of its pleasant taste and flavour. Pineapple is a good source of vitamin A and B and fairly rich in vitamin C and minerals like calcium, magnesium, potassium and iron. It is also a source of bromelin, a digestive enzyme. In addition to being eaten fresh, the fruit can also be canned and processed in to different forms. Pineapple is a tropical plant grows well, both in the plains and also at elevations of 900-1100m above sea level. It tolerates neither very high temperature nor frost. An ideal temperature for successful cultivation of pineapple is between 20^{o}C to 36^{o}C. Slightly acidic soil with pH range of 5.5 to 6.0 is considered optimum for pineapple cultivation. The soil should be well drained and light in texture. The KVK have started demonstration of pineapple in KVK-II, Delakhari farm from the year 2020. Tamia has the ideal agro-climatic conditions (well drained sandy-loamy soil with rich in organic matter, Temperature ranging cool winters 4 to 44 ^{0}C, Annual rainfall 950 to 1150 mm) for pineapple cultivation. Therefore, the famous variety of pineapple *i.e* Queen (5500 slips) were introduced from CIH, Dimapur, Nagaland was grown in over 1300 m^{2} of land with double hedge row planting system in this KVK alone. Agro-climatic conditions of Tamia region are highly suitable for the successful cultivation of pineapple on large scale. Harvested Pineapple fruits from the KVK-II, Delakhari, Tamia farm are considered to be among best in its high TSS content (14 to 15 %) with very little or no fiber and acidity (0.4 to 0.5%). Fruit weight ranging from 0.900 kg to 1.400 kg with greatest appearance and keeping quality.

K2

ASSESSMENT OF FRUITS YIELD OF EGG PLANTS THROUGH FOLIAR APPLICATION OF BORON MICRO NUTRIENT

P.K.S.Gurjar, R.P.S.Tomar, B.S.Kasana, A.S.Yadav, Reeta Mishra, Swati Singh, Reena Sharma, S V S Chauhan, P.P.Singh, Devesh Singh and Rai Singh Kushwah

Krishi Vigyan Kendra,AB,Road ,Morena (Madhya Pradesh)
Email:kvk.morena@rvskvv.net

ABSTRACT

The Estimate 744 thousand hectare areas under the production of egg plant across the India during year 2021-22 and production of brinjal fruit estimated to have 12.98 million metric tons. Effect of Boron as a foliar application at the rate of 500 PPM on egg plants for fruit yield. It was assessed at different famer's field in Gwalior district during 2019-20. Results revealed that application of Boron as foliar spray gave maximum yield 315 quintal per hectare under recommended practice and 254 quintal/hectare received under farmer's practice. In other hand the average net return Rs. 191820 per hectare received and Rs. 60660 per hectare was cost of cultivation under recommended practices. The maximum cost benefit ratio (CBR) was also received under recommended practice.

K3

EFFECT OF DIFFERENT LEVELS OF PRUNING AND INORGANIC NUTRIENTS ON QUALITY OF NERIUM *(NERIUM OLEANDER* L.*)*

A. Vijai ananth[1], G.Sathish[2] and M.S.Marichamy[3]

Pandit Jawaharlal Nehru College of Agriculture and Research Institute,
Karaikal, U.T of Puducherry
Email:gskspice@gmail.com

ABSTRACT

Floriculture has emerged at world level, as one of the most lucrative profession. *Nerium oleander* L. commonly called as Nerium is one among the major loose flowers cultivated in Tamilandu. This crop is preferred by small farmers as it is very hardy perennial crop which requires fewer inputs and can be cultivated in both drought and water logging conditions. Pruning of plants at 90 cm height during January season, application of NPK @ 120: 240: 240 g $plant^{-1}$ along with growth regulator treatment of GA_3 @ 150 ppm concentration applied as foliar spray on 30^{th} and 60^{th} day after pruning can be adopted for enhancement of yield, number of flowering days and quality of flowers in *Nerium oleander* L. cultivars Pink single and Pink double.

EFFECT OF PRUNING TIME ON GROWTH AND YIELD OF CASHEW UNDER CUDDALORE DISTRICT

G.Sathish and M.Pandiyan

Regional Research Station,
Tamil Nadu Agricultural University (TNAU),
Vridhachalam- 606 001, Cuddalore District
Email:gskspice@gmail.com

ABSTRACT

Cashew (*Anacardium occidentale*), a native of Brazil, was introduced in India during the later half of the Sixteenth Century for the purpose of afforestation and soil conservation. From its humble beginning as a crop intended to check soil erosion, cashew has emerged as a major foreign exchange earner next only to tea and coffee. **C**ashew is one of the important commercial plantation and foreign exchange earning crops of the country. Cashew gained importance in hills and plains due to its wide range of climatic and soil adaptability. Imposing shoot pruning treatments on overgrown cashew trees may improve establishment success in the field condition. The present investigation was carried to evaluate the effect of different pruning intensities on growth and yield of cashew at Regional Research Station, TNAU, Vridhachalam during the year 2021 and 2022. The experiment was laid out in randomized block design with four pruning treatments and 5 replications. The results obtained revealed that there was a significant increase in shoot growth and leaf area with highest pruning intensity.

EFFECT OF SULPHUR NUTRITION ON GROWTH AND YIELD OF ONION (A*LLIUM CEPA* L.) IN FARMERS FIELD OF DEWAS DISTRICT OF MADHYA PRADESH

Nishith Gupta, K.S. Bhargav, A.K. Dixit and A.K. Badaya

R.V.S.K.V.V. – Krishi Vigyan Kendra, Dewas, Madhya Pradesh
Email: nishithkvk@gmail.com

ABSTRACT

Onion (*Allium cepa* L.) is an important bulb crop used as fresh vegetable, condiments and also processed. Members of the Alliaceae family contain sulphur compounds, which give them their distinctive smell and pungency. Sulphur is useful for the formation of amino acids, chlorophyll, certain enzymes, vitamins, proteins and oils. Sulphur has been found to increase the bulb yield of onion and also improves its quality, especially pungency and flavour. Severe sulphur deficiency during bulb development has detrimental effect on yield and quality of onion. Keeping the facts on positive effect of sulphur nutrition in onion, front line demonstration was conducted by Krishi Vigyan Kendra, Dewas in 8 locations during rabi season of 2019-20, 2020-21 and 2021-22, to evaluate the effect of sulphur on growth & yield of onion. The demonstration comprised of two treatments *viz.* T1 as Farmers practice (No Use of sulphur) and T2 as recommended practice (Sulphur @ 30 Kg/ha as soil application) replicated at 30 farmers field. The mean data of three years revealed that treatment T2 (Sulphur @ 30 Kg/ha) recorded significantly maximum plant height (57.65 cm), number of leaves per plant (11.54), leaf length (50.24 cm), neck length (5.57 cm), bulb diameter (5.27 cm), fresh weight of bulb (75.12 g), cured weight of bulb (63.18 g) and bulb yield (334.10 q/ha). The maximum net return (Rs 1,92,041/ha) and benefit cost ratio (3.68) were recorded under treatment T2. However the minimum net return (Rs 1,65,287/ha) and benefit cost ratio (3.34) were recorded in control (T1). Thus, in a nutshell, it may be concluded from the present study that the sulphur plays an important role for increasing the yield as well as yield attributing parameters of the crop and also net returns of the farmers.

K6

ENHANCEMENT OF GROWTH AND PRODUCTIVITY OF CUCUMBER (*CUCUMIS SATIVUS* L.) THROUGH CALCIUM BASED FERTILIZER

Dharvendra Singh [*], Narendra Kumawat , Avinash Singh , Sandhya Chaudhary and Mahendra Singh

Krishi Vigyan Kendra (RVSKVV), Manawar, Dhar, (MP), India
Email: kvk.manawar@rvskvv.net

ABSTRACT

The present study was carried out at Research Farm, Krishi Vigyan Kendra (RVSKVV), Manawar (Dhar), during *kharif* season 2020. Total 7 treatments were tried in Randomized Block Design (RBD) with three replications to study the effect of calcium based fertilizer on yield attributes and yield of cucumber. All the treatments significantly improved growth, attributed and yield of cucumber as compared RDF alone treatments. Among the various treatments the maximum plant height and flower setting was recorded with the application of RDF + Turbocalcio Plus @ 2 kg at 25 DAT and 40 DAT (T_5) in comparison to other treatments. However, the less number of days (31.50) to flower appearance was recorded with the application of RDF + Turbocalcio Plus @ 2 kg at 25 DAT and 40 DAT. Significantly higher yield parameters *viz*., length of fruit (15.85 cm), girth of fruits (12.06 cm), weight of fruits (146.83 g/fruit) and no. of fruit/plant (16.50) and fruit yield (324.67 q/ha) were RDF + Turbocalcio Plus @ 2 kg at 25 DAT and 40 DAT (T_5) which was statistically similar with RDF + Turbocalcio Plus @ 2 kg at 25 DAT and 60 DAT (T_6) and RDF + Turbocalcio Plus @ 1 kg at 25 DAT 2 kg at 40 DAT and 2 kg at 60 DAT (T_7).

K7

EVALUATION OF TRACTOR OPERATED GARLIC PLANTER THROUGH ON FARM TRIAL

K S Bhargav, Nishith Gupta, Savita Kumari, Neerja Patel, A K Dixit and A K Badaya

Krishi Vigyan Kendra Dewas (M.P.)
Email:ksbhargav@rediffmail.com

ABSTRACT

Garlic (*Allium sativum* L.) is an important foreign exchange earner for India as well as in Malwa region of Madhya Pradesh. The farmers generally plant garlic by manual method, which is labour intensive and time consuming. Tractor-operated garlic clove planter evaluated for its performance in the famer's field of different villages of Dewas district. The average depth of seed placement by the planter was found 30.5 mm. The average seed spacing and seed rate were found 85 mm and 400 kg.ha^{-1}, respectively during field trial. The effective field capacity and field efficiency of the planter were 0.30 ha.h^{-1} and 76%. The cost of planting by the planter with operational cost of tractor was Rs 1000 per hour (Rs 2500 per ha) and was less as compared to manual planting of garlic.

EFFECT OF SYNTHETIC MULCH THICKNESS ON HYDRO-THERMAL REGIMES, NUTRIENT UPTAKE AND YIELD OF CAULIFLOWER (*BRASSICA OLERACEA* L. VAR. *BOTRYTIS* L.)

Komal, R S Spehia and J C Sharma

Department of Soil Science and Water management
Dr Y S Parmar University of Horticulture and Forestry, Nauni, Solan, HP
Email: rsspehia.33044@gmail.com

ABSTRACT

The present investigation was conducted during 2021-22 at experimental farm of the Department of Soil Science and Water Management, Dr Y S Parmar University of Horticulture and Forestry, Nauni, Solan-173230 (HP) with the objective to study the effect of thickness of synthetic mulches on soil hydrothermal regimes, nutrient uptake, yield and economics of cauliflower production. Research trial comprised of 11 treatments *viz*. 5 mulch thickness of 20,25,30,50 and 100 micron with combination of silver or black colour upwards in addition to control. Thickness of synthetic mulch improved soil hydrothermal regimes, physical, chemical & biological properties, NPK uptake, growth and yield of cauliflower over control. Minimum and maximum temperature recorded at two depths (0.05m, 0.10m) revealed that mulch increased the minimum soil temperature by 1.5 ℃ and 1.4 ℃ over control at 0.05m and 0.01m, respectively, while there was no significant effect of mulch on maximum soil temperature.

Significantly maximum soil viable microbial count, NPK and S content and uptake in leaf, curd and root were recorded under 100µ, black/silver polyethylene mulch (T_7) but were statistically at par with treatment T_4 (30µ, silver/black mulch),T_5 (25µ, silver/black mulch),T_6 (20µ, silver/black mulch) and T_8 (50µ, black/silver polyethylene mulch). Treatment T_7 (100µ, black/silver mulch) increased the yield by 33% over control but was statistically at par with T_4 (30µ, silver/black mulch),T_5(25µ, silver/black mulch),T_6 (20µ, silver/black mulch) and T_8 (50µ, black/silver polyethylene mulch). However maximum net return along with best B:C ratio was recorded under treatment T_6 (20µ, silver/black mulch) as the cost of cultivation was almost half of that of treatment T_7 (100µ, black/silver polyethylene mulch) which recorded B:C ratio of 0.44:1. Therefore, 20µ, silver/black mulch can be recommended for late group cauliflower production.

E-HORTICULTURE: QUICK SOLUTION FOR SMART FARMER ON DIGITAL PLATFORM

K.N.Jagadis[1], Venkatta Kumar., R, Atheequlla., G. A,Loganandhan, N.,

Saju George, and Balakrishna, B.,
Email: kn.jagadish@icar.gov.in

ABSTRACT

Social media is a buzzword; rural areas are also making use of these platforms, perhaps, even in a more meaningful way.Perhaps a very few use such modern methods of information technology-Whatsapp such eHorticulture Whatsapp group for dissemination of IIHR Technologies. eHorticulture has become another name for 'ready solution to the horticulture related problems faced by the farmers' from IIHR as well as State Agricultural University (SAU) and NGOs also. eHorticulture experts have moved a step forward by effectively using social media sites like Facebook and WhatsApp for sharing information with progressive farmers, especially with the youth and entrepreneurs.

In the present day context of agriculture, farmers access to reliable, timely and relevant information has become very important. Farmers require access to more varied, multisource and context-specific information, related not only to best practices and technologies for crop production and weather, but also to inform about post harvest aspects, including processing, marketing, storage, and handling. Mobile connectivity is a major boon towards reaching the farmers. Especially with recent advancement - the smart phones with WhatsApp is very useful in quickly responding to the specific problems faced and posted by the farmers on WhatsApp group like "e Horticulture" where the group of experts with in no time respond to the problem posted by the farmer in the form of image or video or text. In the conventional extension tools, lot of time is required on the part of the extension functionary so as to reach the farmer.

FEASIBILITY STUDY OF GRAVITY-FED DRIP IRRIGATION SYSTEM IN HIGH DENSITY PLANTATION IN GUAVA

A.K. Sharma, J. Kwatra* and Sanjay Kumar

KVK Dehradun and *KVK Kashipur
GB Pant University of Agriculture and Technology Pantnagar
Email:kvkdehradun@gmail.com

ABSTRACT

An experiment was conducted in 2019-2020 to evaluate the feasibility of gravity- fed drip irrigation under sub-humid climate of Uttarakhand. In the field study, an attempt has been made to evaluate the performance of the drip fertigation system based on the uniformity of water distribution & wetting pattern. Drip system was used for optimizing the water requirement of guava crop in 20 varieties in high density planting. The experiment was laid out in Randomized Block Design (RBD) with twenty treatments consisting of two levels of irrigation; 40%, 80% of irrigation through drip method check basin (full irrigation) and control (rainfed), with 3 replications. Analysis revealed that Emission Uniformity (EU) and Statistical Uniformity (SU) of drip system were 64% and 84 %, respectively. Wetting pattern showed that moisture concentration was high within 0-15 cm from the emitter on the surface, and significant rise in moisture was observed when water application exceeded 4 litres/hr of flow volume. The crop geometry was managed in 3x3 mts distance. Growth parameters of guava viz number of primary branches, fruit diameter (cm), fruit weight was recorded maximum in T5. Yield of guava was recorded maximum in T6 treatment (35.97 t/ ha) and water saving was registered 40% over full irrigation method. Besides, Water Use Efficiency (WUE) in same treatment was found to be highest (90 kg/ha-mm). The study indicates that in hilly terraces, gravity-fed drip irrigation is a cost-effective irrigation method and able to conserve the scarce water resources, minimizing soil erosion and thus enhancing the guava productivity and maintaining the environmental quality.

TECHNOLOGICAL INNOVATION IN HI- TECH HORTICULTURE

Krishna Kumari Purbia

Rajasthan College of Agriculture, Udaipur
Email: Krishnapurbia228@ gmail.com

ABSTRACT

Horticulture is one of the important components of agriculture sector which has enormous potential to provide food as well as nutritional security. It also can bring prosperity to nation by improving the farmer's economic condition and agriculture sector. Thus upgrading the horticultural practices with high technology can fulfil this aspect. In the recent years, with the increase in population, there is a also increase in the demand for food and nutritional security. The conventional method of farming cannot cope with the increased demand, thus it is required to upgrade the technologies in the agriculture field. Horticultural sector provide great scope for the use of hi technology in this area since by cultivating in small area of land the productivity is higher (especially vegetable, flowers crops and medicinal crops) as compared to other agronomic crops. Hi-Tech horticulture provides a tremendous potential for producing high quantity and quality of produce.

Advantages of using high-technology farming is high productivity per unit area this will increase in production up to 5 to 8 folds, there will be saving in key contribution like water, (up to 50%), fertilizer (25%), pesticide, fungicide and herbicide, this approach produces better more consistent results as compared, this is feasible in uneven , sandy & hilly land and problematic soil like saline, water logged soil etc. and the crop will less environmental dependent and can be cultivated round the year. Thus adopting in technologies in horticulture will not only improve the economic condition of farmers but also prosper our country by providing food as well as nutritional security.

Technical Session : L

Advances in aquaculture, dairy and veterinary sector towards food and nutritional security.

L1

DAILY FOOD AND NUTRIENT CONSUMPTION BY THE LODHA TRIBAL WOMEN IN THE MAYURBHANJ DISTRICT OF ODISHA

[1]Jhunilata Bhuyan and [2]Dr. Sasmita Behera

[1]Home Science Dept. Rama Devi Women's University, Odisha, 751007
[2]Associate Professor, Berhampur University, Odisha, 760007
Email:jhuni.chutki@gmail.com

ABSTRACT

The total tribal population of India was 104, 281,034 as per the 2011 census and it accounts for 8.6% of the total population of the country. Tribal are at greater risk due to illiteracy, ignorance, poverty, poor socioeconomic status, customs, and taboos of their locality. Lodha tribe is one of the backward primitive vulnerable tribal groups mostly seen in the Mayurbhanj district. They are leading a very miserable life. Lodha tribal women also lead a very miserable life. The study was conducted in the years 2020 and 2021. The study was conducted in ten villages over four blocks in the Mayurbhanj district of Odisha. Three hundred respondents belonged to non-pregnant and non-lactating Lodha women of 18-45 years of age group. The data was collected from the Lodha women through a questionnaire cum interview schedule. The food intake of the respondents was measured by the 24-hour recall method. The intake of cereal by the respondents was 375.53± 13. 62 g and was more than Recommended Dietary Allowances (RDA) of ICMR (360 g). Generally, the diet of the Lodha women is based on cereal as it is low cost and is easily available through PDS. The intake of pulses was 23.86 ± 3.31 g and was low as compared to Recommended Dietary Allowances (RDA) of ICMR (75 g). All other food groups such as pulses, fruits, green leafy vegetables, roots and tubers, other vegetables, milk and milk products, fish/meat, sugar and jaggery, and fats and oils were 23.86 ± 3.31 g, 11.17± 1.87 g, 24.12±7.38 g, 25.44 ±6.15 g, 24.8 ±6.57 g, 0.8 ± 4.0 ml, 44.67± 6.61 g, 18.7 ±4.24 g and 20.44 ± 4.17 g and were lower than RDA of the ICMR. The intake of fruits and milk and milk products by the respondents was very low (0.8 ml) as compared to the RDA (300 ml) of the ICMR. In this study, the intake of all the food groups except cereals of the tribal women was low and unsatisfactory in comparision with Recommended Dietary Allowance (RDA) of ICMR. Similarly, the intake of all the nutrients was low and unsatisfactory except for carbohydrates in the diet of the respondents in comparison with Recommended Dietary Allowance (RDA) of ICMR. Both the food groups intake and the nutrient intake significantly (P=0.000) differed from ICMR standards of food groups and nutrients.

DEVELOPMENT OF FUNCTIONAL KADAKNATH NUGGETS USING CARRAGEENAN

Narendra Nayak*, Pranav Chauhan, Sandeep Nanavati[1]

College of Veterinary Science & A.H.,(NDVSU) Mhow, Indore (453446), M.P., India
Email- nayaknarendra2@rediffmail.com,

ABSTRACT

An experiment was performed to enhance the functional value of meat nuggets developed from kadaknath. At three different levels, carrageenan was used to develop low fat kadaknath meat nuggets. Devolved products were assessed for various physicochemical, textural and sensory attributes. Cooking yield and moisture content differed significantly ($P<0.05$) among the treatments. The fat content was reduced significantly ($P<0.05$) in developed functional meat nuggets compared to control. The moisture and fat retention were increased with increasing level of carrageenan and differed significantly ($P<0.05$). Hardness, cohesiveness and gumminess values of functional kadaknath nuggets differed significantly ($P<0.05$). Sensory attributes of carrageenan incorporated kadaknath meat nuggets indicated comparable scores for T-2 compared to control. Overall acceptability revealed that product was very well accepted at 0.5% incorporation of carrageenan and may be used in the development of functional kadaknath nuggets without affecting the quality and sensory attributes.

EFFECT OF FEEDING DIFFERENT HYDROPONIC FODDER ON THE POST WEANING GROWTH PERFORMANCE OF BLACK BENGAL GOATS IN URBAN AND PERI-URBAN AREA OF DISTRICT SARAIKELA-KHARSAWAN IN JHARKHAND

Pankaj Seth, Navab Singh, S. L. Baxla and J. Oraon

E-mail: Psethext@gmail.com

ABSTRACT

The On Farm Trail (OFT) was conducted to examine the effect of feeding different hydroponic fodder in the diet of Black Bengal goats on their production performance. The study was undertaken in Saraikela Kharsawan district of Jharkhand. Data were solicited from purposively selected 30 goat keeper farmers under the On Farm Trail (OFT) programme of Krishi Vigyan Kendra (KVK) Saraikela Kharsawan, Jharkhand, India. Different seeds such as barley, wheat, horse gram, cow pea and yellow maize were utilized for green fodder production by hydroponic method. However, this novel experiment was aimed to study the effect of hydroponic horse gram fodder and hydroponic maize fodder on the post weaning growth performance in Black Bengal kids. Sixty male Black Bengal kids at the age of 3 months were randomly divided into 3 groups each having 20 kids' viz. technical option I (Farmer's Practice + Hydroponic horse gram fodder), technical option II (Farmer's Practice + hydroponic maize fodder) and technical option III (50% hydroponic horse gram fodder + 50% hydroponic maize fodder). Production parameters such as total body weight gain (kg), daily body weight gain (kg), total feed intake/head/30 day (kg) (DM basis) and feed conversion efficiency (%) and cost of feeding were studied.

After analysis of collected data, result revealed that supplementation of nutrients as green fodder increased body weight in Black Bengal goats significantly than the non supplemental group. Among the three supplemented groups the technology option III i.e. supplementation of Farmer's Practice (FP) along with hydroponic green fodder 50 % horse gram and 50% maize at the rate1kg per goat per day have found 7.24 Kg body weight gain and per cent increased (92.00%) and maximum B:C ratio (2.08:1).

L4

EFFECT OF NONI JUICE, PLUM PUREE AND POMEGRANATE RIND EXTRACT AS NATURAL ANTI-OXIDANTS IN CHEVON PATTIES

N K Nayak,* P Chauhan, D Patel, S Dawar and A Dubey

Department of Livestock Product Technology, College of Veterinary Science and Animal Husbandry, NDVSU, Mhow, Indore (MP) 453446, India
Email:- nayaknarendra2@rediffmail.com

ABSTRACT

Three selected variants of different natural antioxidants viz; noni juice, plum puree and pomegranate rind extract at the level of 3% each were compared as antioxidant in the development of meat products. The cooking yield and moisture retention were significantly ($p<0.05$) lower in plum puree compared to other two variants. However, noni juice had highest value. The mean score for general appearance and juiciness were significantly ($p<0.05$) lower in pomegranate rind extract compared to noni juice and plum puree. However, the highest score was given for noni juice by sensory panelists and scores for flavor, texture, saltiness, mouth coating and overall acceptability were also highest for noni juice. Therefore, noni juice at the level of 3% widely accepted and may suitably be used without affecting the physicochemical properties and sensory attributes of the developed functional chevon patties.

L5

EFFECT OF PRE-TREATMENTS ON PHYSICO- CHEMICAL COMPOSITION OF DRIED CHILLI (CAPSICUM ANNUM L.) VAR. KASHMIR LONG-1

Towseef. A. Wani*, Quraazah A. amin ., M.A Mir

Division of Food science and technology ,S.K. University of Agricultural Sciences & Technology of Kashmir, Shalimar, Srinagar - 190 025, Jammu & Kashmir (India)
Email: towseef46@gmail.com

ABSTRACT

A study was carried out to assess the effects of chemical pretreatments on product quality of chilli, after drying *Capsicum annum,* (var. Kashmir Long-1). Pretreated chilli were dried upto optimum moisture levels and assessed for various physicochemical changes. The results revealed that among the pretreated samples, 2.5% potassium carbonate + 1% ground nut oil + 0.1% gum acacia + 0.001% butylated hydroxy anisol L-1 for 15 min had highest ascorbic acid (41.08 mg 100 g-1), capsaicin (1.077% db) and reducing sugar (0.617% db) contents; and lowest moisture (9.85%) and non-enzymatic browning (0.123) values. The most efficient pre treatment for drying of chillies as it retained the nutritional properties and colour characteristics and reduced the drying time.

EMINENCE OF CAGE CULTURE IN DIFFERENT FISH STOCKING DENSITIES: HARNESSINGAQUACULTURAL OPPORTUNITIES

Ipsita Biswas*, Shivendra Kumar, M.L. Meena and M.S. Kundu

KVK Muzaffarpur (Additional)
Dr. Rajendra Prasad Central Agricultural University, Pusa (Bihar)
Email: ipsita@rpcau.ac.in

ABSTRACT

Indian reservoirs hold the key for increasing substantially to the fish basket of the country. Despite high production potential of reservoirs and wetlands the realization of fish yield is low. There is an enormous scope of enhancing fish yield from such untapped resources with a spread are of 3.15 million ha through cage culture. Cage aquaculture involves rearing fishes with high returns in enclosed structures in such free flowingnatural water bodies.The structure comprises of a floating frame, net materials and mooring system to hold and culture fishes. Moreover, cage culture practices is being looked upon as an opportunity to utilize existing untapped water resources with great production potential and posed as a response to increased demand for animal protein. Under such circumstances, the efficacy of cage culture was studied in a holistic approach using the effects of different stocking densities on the growth, feed conversion ratio and survivability of *Labeorohita*(Rohu). The main objective of this study was to validate and assess culturing freshwater fishes in cages using farm level primary data by maintaining specific stock and feeding them at regular intervals. A total of 24 cages (6X4X4m) with two batteries operated in two selected wetlands of Bihar. The growth rate was compared with the fishes from open water bodies. Four different culture trials were conducted in net cages having different stocking densities $10/m^3$, $15/m^3$, $20/m^3$& $25/m^3$, respectively. The results revealed about the inverse relationship between growth and stocking density. Fishes stocked at the rate of 15/m3 showed higher growth rate as compared to others. After economic analysis, the potential of culturedRohu fishes in cages was found to be remarkable in increasing fish production in selected stocking densities. Therefore,initiatives to commercialize such technologies through extension programswill go a long way in expanding the horizon of Blue economy of the country.

ENTREPRENEURSHIP DEVELOPMENT THROUGH PROCESSING AND VALUE ADDITION OF HORTICULTURAL CROPS

Y. Prabhabati Devi and R.K. Lembisana Devi

KVK, Chandel. ICAR, Manipur Centre
KVK, Thoubal, Dept of Agriculture, Govt. of Manipur
Email : prabhayumnam@rediffmail.com

ABSTRACT

Horticultural cropsare rich sources of vitamins, minerals and have high nutraceutical values. It has high moisture content, tender texture, highly perishable and deteriorate rapidly if not handle properly. Losses during post-harvest operation are enormous and matter of great concern.To tackle such problems, KVK, Chandel took initiative for the promotion of processing and value addition of seasonal fruits in the form of nutri candy, cheese, burfi, fruitball, chutney, RTS, juice, jam, jelly, dry preserves, fruit tea and pickle etc. With the support of ICAR, Manipur centre and TSP,six community processing centres were established atChandel district with different brand name of organic nutri products. Processingand value addition of seasonal fruits and vegetables becomesa golden sector in thepresent-day marketingas it plays a very important role in providing food and nutritional security especially during COVID pandemic.Due to consumer awareness of health, quality of food and healthy nutrition option, convenience and ready to eat food product, the demand for value added products is growing. All the products have high sensory attribute and B.C ratio is also very high.The processed products could reduce the post- harvest losses to 20% from 80%. The shelf life of the processed products also increased,which make the product available throughout the year and also help to improve the nutritional status of the people. Entrepreneurship in postharvest management and value addition is not only opportunity but also a necessity for improving the production and profitability.From value added products, women entrepreneurs could earnmore than two lakhs annually and also provide employment opportunities to manyfarm women, rural youth and school drop outof tribal areas.It helps to become financially self-reliant, improve the status of the family in their society, increase influence and acceptability among fellow members, increase material possessions and improve children's educational quality. The entrepreneurship development on processing and value addition could sustain livelihood of other women by generating employment and can also improve economic status of theof the family, society and nation as a whole.

ENTREPRENEURSHIP DEVELOPMENT THROUGH PROCESSING AND VALUE ADDITION OF PULSES-NUTRI- BLENDEDCHUNK (BORI)

R.K Lembisana Devi and Dr. Y.PrabhabatiDevi

KVK, Thoubal, Dept. of Agriculture, Govt. of Manipur, KVK, Chandel. ICAR, Manipur Centre
Email : prabhayumnam@rediffmail.com

ABSTRACT

Processing and value addition of pulses becomesan important function in the present-day marketingas pulses plays a very important role in providing food and nutritional security especially during COVID pandemic. It is a cheaper source of protein than milk, fish, meat and nuts Nutri chunk is a legume based dried nutri product made by mixing legume (soak black gram dal) with mushroom powder, Chinese chives, Allium hookre root and spicesThis technology is developed to increase the nutritional status of the vegetarian population and also to increase the shelf life of mushroom as mushroom contain 90 to 95% moisture and starts deteriorating from 1-2 days at the ambient temperature. It is a complete health food which have high medicinal and nutraceutical properties. Nowadays, the demand of nutrichunk keeps on increasing due to its excellent source of high quality protein, vitamin, mineral and can contribute into formulation of balanced diet.Nutrichunksare now experimented for value addition withdifferent treatmentsof blackgram with medicinal herbsAllium hookeri, Chinese chives and mushroom powder. This product can extend the shelf life of mushroom up to 1 years and also can made available throughout the year and alsoact as a nutrient enrichment in the diet. These products have very high sensory properties in terms of appearance, colour, flavour and taste.The results showed that treatment five i.enutrichunk prepared with 20% mushroom powder, black gram dal, spices, Chinese chives andAliumhookeriare the best treatment and excellent product without any significant change in quality attributes of the nutri chunk. This nutri product could facilitate sustainable livelihood through entrepreneurship development and enhance thesocioeconomic status which helped to double the income of the farmer

ENTREPRENEURSHIP DEVELOPMENT THROUGH PROCESSING AND VALUE ADDITION OF HORTICULTURAL CROPS

Y. Prabhabati Devi

KVK, Chandel. ICAR, Manipur Centre
Email Id: prabhayumnam@rediffmail.com

ABSTRACT

Horticultural cropsare rich sources of vitamins, minerals and have high nutraceutical values. It has high moisture content, tender texture, highly perishable and deteriorate rapidly if not handle properly. Losses during post-harvest operation are enormous and matter of great concern.To tackle such problems, KVK, Chandel took initiative for the promotion of processing and value addition of seasonal fruits in the form of nutri candy, cheese, burfi, fruitball, chutney, RTS, juice, jam, jelly, dry preserves, fruit tea and pickle etc. With the support of ICAR, Manipur centre and TSP,six community processing centres were established atChandel district with different brand name of organic nutri products. Processingand value addition of seasonal fruits and vegetables becomesa golden sector in thepresent-day marketingas it plays a very important role in providing food and nutritional security especially during COVID pandemic.Due to consumer awareness of health, quality of food and healthy nutrition option, convenience and ready to eat food product, the demand for value added products is growing. All the products have high sensory attribute and B.C ratio is also very high.The processed products could reduce the post- harvest losses to 20% from 80%. The shelf life of the processed products also increased,which make the product available throughout the year and also help to improve the nutritional status of the people. Entrepreneurship in postharvest management and value addition is not only opportunity but also a necessity for improving the production and profitability.From value added products, women entrepreneurs could earnmore than two lakhs annually and also provide employment opportunities to manyfarm women, rural youth and school drop outof tribal areas.It helps to become financially self-reliant, improve the status of the family in their society, increase influence and acceptability among fellow members, increase material possessions and improve children's educational quality. The entrepreneurship development on processing and value addition could sustain livelihood of other women by generating employment and can also improve economic status of theof the family, society and nation as a whole.

FARM LEVEL DAIRY ENTREPRENEURSHIP: AN ALTERNATE TO ACHIEVE SDG OF ZERO HUNGER AT MACRO LEVEL

Inderpreet Kaur, Varinderpal Singh, Navjot Kaur and Hanish Sharma

Department of Dairy Economics & Business Management, College of Dairy Science & Technology, GADVASU, Ludhiana-141004
Email:dhamisimmu5@gmail.com

ABSTRACT

With increasing income and more demand for protein rich animal-based diets, dairy farming plays crucial role to balance the under nutrition, over nutrition and micro nutrient deficiencies across the globe. Therefore, the secondary study was conducted first to analyze the status of livestock and dairy in the leading economies of the globe. Secondly, to determine the role of dairy products in the evaluation of nutritional security of the G20 countries and their economic statement from the dairy sector w.r.t. Indian Context. According to Recommended Dietary Allowance, 0.8 to 1gm protein/ kg BW/ day is required and milk provides 3.4 g protein per kg of milk. Milk is a better option to fulfill protein requirement. However, per capita consumption of milk is 185 gm and 146 gm per day in urban and rural India.In the last three decades, world milk production has increased by more than 66 percent where India is the world's largest milk producer, with 22 percent of global production, followed by the United States of America and China.

Indian export potential of the dairy products is 108.71 thousand MT of quantity supplied which has generated a total revenue of USD million 391.59 in the year 2021-22. Among G20 members, major proportion of dairy products has been exported to Saudi Arab (USD Mill 24.88), U.S.A (USD Mill 18.99) and Australia (USD Mill 5.58).In order to achieve Sustainable Development Goal 2, i.e., zero hunger, entrepreneurship orientation towards nutrition sensitive agriculture is required at local rural scale. Value addition, nutrition sensitive agricultural policies, entrepreneurship and extension services by the government at local level, multilateral trade policies at macro level would ensure farm to global food security as a whole.

IMPACT OF MILLET AND VALUE ADDITION TRAINING ON KNOWLEDGE LEVEL OF RURAL WOMEN IN NUTRI SMART VILLAGE

D.C.Shrivastava*, S.Pannase , R. Thakur, S. Alawa and C.Bhargawa

Krishi Vigyan Kendra Chhindwara, Jwaharlal Neharu Agricultural University,Jabalpur(M.P.)
Email- dcshrivastava@ jnkvv.org

ABSTRACT

Millets are the major staple food grains of the farming community, as they provide both food and nutrition security. However processing and value addition to major cereals such as wheat and rice have changed the dietary pattern of the people. But millets are re- gaining nutritional importance in urban community as therapeutic foods in the management of metabolic disorders. A study was conducted in chhindwara district of Madhya Pradesh to know the extent of knowledge rural women in relation to Millet and Value addition food . Nutrition awareness programme was conducted through lectures, charts, live models and demonstration of millet recipes. Millet snacks were also distributed during sessions for taste and acceptability. The mean knowledge scores of trainees of three Batches of 2022 at three stages i.e. at pre-training phase, immediately after the training and 15 days after the training. It is clear that immediately after the training; there was sharp increase respondents (56.66 per cent) had high level of knowledge score. When the trainees were observed after 15 days of training it was found that the knowledge was 30.32 while the knowledge level declined slightly as is evident from the reduced mean knowledge score i.e. (40.62 and 30.32) respectively. It can be suggested that similar type of trainings programme increase the small level income generation women group and recommended for conducting at different part of the country.

IMPACT OF MUSHROOM CULTIVATION ON SOCIO-ECONOMIC STATUS OF FARMERS OF GHAZIPUR DISTRICT

Omkar Singh

ICAR- Krishi Vigyan Kendra, P.G.College, Ghazipur (U.P)
Email:omkar.singh39734@gmail.com

ABSTRACT

Mushrooms are being used since the time immemorial. Nowadays, mushrooms are popular valuable foods. There are different kinds of edible mushrooms cultivated all over the world.The main purpose of this study was to determine the impact of mushroom cultivation on socio-economic condition of beneficiaries. The study also aimed at explaining the socio demographic characteristics of the respondents with exploring the relationship between all these characteristics and their income from mushroom cultivation of the respondents. The study was conducted in five blocks (Sadar, Jakhania, Kasmabad, Manihari and Birno) of Ghazipur district of Uttar Pradesh. For this purpose eighty respondents were selected randomly. Data were personally collected by the researcher, compiled and interpreted as per objectives of the study. The findings indicated that most of the respondents of the study area were middle aged (70 percent) and had secondary to above secondary level of education (81 per cent) with small to medium (83 per cent) family. On the other hand most of them had medium extension contact (58.1 per cent), highly cosmopolite (40 per cent), medium utilization of mass media (55 percent) although they are moderately innovative (61 per cent) minded. The respondents had an average two years mushroom farming experience which developed favorable attitude (70 per cent) towards mushroom cultivation. Co-efficient of correlation analysis indicated that respondent's annual income, mushroom farming experience and mass media utilization had positive significant relationship with income from mushroom cultivation although age had negative significant relationship. Mushroom cultivation brought positive impact on different aspects of livelihood of the beneficiaries. Annual income, standard of living and household condition of the beneficiaries were increased as compared to the previous year. Considering all these it can be said that mushroom cultivation is beneficial both for social and economic improvement.

KNOWLEDGE, ATTITUDE AND PRACTICES OF ANIMAL OWNERS RELATED TO RABIES IN PUNJAB STATE OF INDIA

G S Gill, B B Singh, J P S Gill and R S Aulakh

Krishi Vigyan Kendra, Faridkot, Punjab Agricultural University (PAU), Ludhiana, Punjab, India.

ABSTRACT

Rabies is a neglected zoonotic disease in India. Farmers and pet owners constitute an important risk group and account for highest rabies cases followed by students and children. Understanding the knowledge, attitude and practices of risk groups could help identifying knowledge gaps, cultural beliefs and behavior patterns that may pose hurdle in controlling such diseases. Overall, 22 villages and 10 wards were surveyed and 336 participants comprising of 175 pet owners and 161dairy animal owners were enrolled in the study. The close-ended questionnaire was designed to collect the relevant information from the participants. Demographic characteristics such as age, gender, household size, place of residence, level of education, and district were used as the explanatory variables. For outcome variable(s), a knowledge score (range 1–20) was prepared by adding up the basic knowledge of respondents about rabies.

The invariable and multivariable linear regression analyses were applied to determine the significant association between explanatory and the outcome variable. More than 95% of the dairy animal and pet owners were aware that rabies can be transmitted from animal to humans. However, 19.9% (31/130) dairy animal owners and 21.7% (38/137) pet owners believed that rabies can be prevented by traditional therapeutic methods and less than 50% of the respondents were aware that bite wound should be washed with soap and water. Age and the level of education were significantly associated with the rabies knowledge in livestock and pet owners. Public health education programs should be developed to educate animal owners on issues such as the first aid measures after dog bites, how to judge a behavior of dog and how to avoid getting bitten by dogs.

MUSHROOM PRODUCTION: A WAY TOWARDS NUTRITIONAL AND ECONOMIC SECURITY

A.K. Sharma, Kiran Pant and M.P. Singh

KVK Dehradun, GB Pant University of Agriculture and Technology Pantnagar
Email:kvkdehradun@gmail.com

ABSTRACT

The fresh mushroom contains about 84-90% moisture, 2-3% protein,3-4% carbohydrates, 0.5-1% mineral sand 0.3-0.4% fats and vitamins. Unique properties of some medicinal mushroom include like lowering blood cholesterol, defense against cancer and invigorating hair growth. Edible mushrooms are also rich in vitamins such as niacin, riboflavin, vitamin B complex, D, and C vitamins. In addition to Oyster and button mushroom, Reishi, Milky, Shiitake, Ganoderma, keedajadi are becoming popular and are becoming profitable and preferable species. Mostly young landless, unemployed, educated people, entrepreneurs and enthusiastic and rural women are adopting mushroom farming on commercial scale in India. Shrinking land holding, rapid growth of unemployed youth and production and marketing of different types of mushrooms could be one of the sustainable options for income generation and providing employment to semi urban and rural masses as well as semi-rural –urban masses. Several demonstrations were conducted studying different parameters in mushroom cultivation. The results shows that farmwomen were more enthusiastic in mushroom cultivation at Dehradun. On the basis of initial record, SSI was conducted on selected farmers and their problems and prospectus were analysis. Economic analysis of button mushroom grower has clearly indicated BCR ranging from 1.57 to 2.54. Among farmers button mushroom was their first priority to mitigate the market demand. Seasonal farmers or resource deficit farmers were getting less returns in comparison to resource rich farmers. The study also reveals that though the farmers are being fascinated with this but the other side reflects that they are facing various problems during cultivation and marketing including insufficient storage handling and storage facilities for perishable final goods, hygienic cultivation chambers, need of pure and quality spawn, access to old fashioned labequipment, unorganized market facility and poor technical knowhow etc. are to be addressed expansion of this sector.

NUTRIGARDENS- WAY TO IMPROVE NUTRITIONAL SECURITY IN RURAL AREAS OF DAVANAGERE DISTRICT

Basavanagowda M G [1], T N Devaraja[2], J Raghuraja [3] and Mallikarjuna B O[4]

ICAR-TaralabaluKrishiVigyan Kendra, Davanagere 577005 (Karnataka) State.
Email: bghort@gmail.com

ABSTRACT

India may be the world's second largest producer of food, but it has its second largest undernourished population. Further, more than half of women in India suffer from anaemia, which leads to high rate of low-birth weight babies. This study was carried out with the objectives to promote dietary diversification to improve the nutritional status of the farm families and to make available vegetables and fruits throughout the year. The Nutrigarden Scheme was implemented for 25 farm families in Rameshwara village of Nyamathi Taluk. Seed kit with 10 vegetables was given.It can also be noticed that 92 per cent of the families monthly expenses was between Rs. 5,000 to Rs. 10000 and other 8 per cent of the respondents of the families monthly expenses was between Rs. 10,000-R.15000.The main purpose of the families to adopt nutri-garden is for the betterment of family health (100%). Production of vegetables after the intervention of nutrigarden was changed by 284 per cent, vegetable availability was increased by 73.40 per cent and compost yield was changed by cent per cent. Whereas amount spent on vegetables was decreased by 18.52 due to availability of Vegetables at their gardens.

NUTRITIONAL AND MEDICINAL USE OF *KASURI METHI* (*TRIGONELLA CORNICULATA*).

Rekha Tiwari, D. S. Tomar and M.K.Bhargava

Krishi Vigyan Kendra (RVSKVV), Ujjain and Shivpuri (M.P.)
E-mail: rekhaup_2007@rediffmail.com

ABSTRACT

India bestowed with the vast climatic and soil conditions is a hub of diversified crops viz. field crop, minor millets and horticultural crop. Among the horticultural crop also, there are several types of crops-fruits & vegetable, roots & tubers, herbs & shrubs, flowers, spices &condiments as well as aromatic plants etc. Fenugreek (*Trigonella spp*.) is 3rd largest seed spice in India after coriander and cumin. The dried seeds, fresh and dried leaves and tender shoots are all consumed and are valued as food, flavouring agent and medicine. Fenugreek seeds substantially contain important steroid saponin called "Diosgenin", whose content in seed varies from 0.62-2.20 per cent which is used in synthesis of sex hormones and oral contraceptives. *Trigonella foenum-graecum* (common methi) and *Trigonella corniculata* (kasuri methi) are two species of Trigonella which are economically important in India. These two species differ in their growth habit and yield. The present study highlights its cultivation, postharvest management, plant protection, seed production and quality standards of kasuri methi. Krishi Vigyan Kendra (RVSKVV), Ujjain (M.P.) has assessed kasuri methi for the first time at rural level. Kalyanpura one of the selected Nutri Smart Village adopted since 2016-17 to till date the trial were conducted from 2020-21 to 2021-22 for minimizing the malnutrition problem as well as to aware the farm families regarding contents of nutritional value and medicinal use of it and to improve the nutritional & health status. 15 farm families were selected with the help of ICDS, Ujjain for conducting the demonstration. The targeted group were children below 6 yr who were SAM and MAM. Seed of kasuri methi were provided to the selected targeted group for cultivating at backyard. Awareness programme were also conducted regarding the medicinal role and nutritional value content in it. The physical parameter like age(years),Height (cm) and BMI was calculated before and after for assessing the impact of kasuri methi. It was found that there was positive correlation in increasing the physical parameters and consumption of kasuri methi in daily diet.

POTENTIAL OF MALE CALVES REARING FOR PROMOTING CROP DIVERSIFICATION IN PUNJAB STATE OF INDIA

Inderpreet Kaur, Varinder Pal Singh, Hanish Sharma, Nivedita and Navjot Kaur

Department of Dairy Economics and Business Management, College of Dairy Science and Technology, Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana, India.
Email: sharma.hanish@yahoo.com

ABSTRACT

Buffalo is known as the 'Black Gold' of India as it alone contributes about 49% of total milk production in India. Buffalo rearing is mainly concentrated in states like Uttar Pradesh, Rajasthan, Madhya Pradesh, Gujarat, Andhra Pradesh, Punjab and Haryana. Among all the states, Punjab and Haryana contributes 19.64 % to the total buffalo milk production. In Punjab, Buffalo are reared for milk, meat, draft power and manure. With only 3.66 % of India's buffalo population, Punjab produces 9.82 % of total buffalo milk production and 7.12 % of the total carabeef production of India. Buffalo Male calves can be a viable diversification option as it gives good quality meat to slaughter industry. So, it is very important to study the cost and returns structure of male calves for providing viable revenue option in agriculture to farmers.

The present study to analyze cost and returns of buffalo male calves was conducted in three agro-climatic zones of Punjab by selecting 90 buffalo male calves rearing farmers in the district viz. Hoshiarpur, Patiala and Mansa by simple random sampling method. The total cost of rearing male calves was found to be Rs. 44,752 for attaining ideal weight of 100-125 kg in 12 months. The cost of rearing of buffalo male calves was highest in first 3 months i.e. Rs. 16548.5 and maximum profit was Rs. 3155 in 9^{th} -12^{th} month period. The net returns were negative in first six months. 95 % of the farmers were disposing their male calves in first three months before attaining ideal weight due to high feed cost and lack of awareness regarding feeding practices. The study concluded that government should provide nutritional guidelines to farmers, so those males calves could achieve ideal body weight and get maximum price at market at the time of selling. So, as to achieve this business its full potential government agencies should conduct training on scientific rearing of male calves and provide subsidy for rearing of male calves at farm level to get maximum returns.

SCALING UP OF VETERINARY EXTENSION INNOVATIONS, APPLICATION AND STRATEGIES TOWARDS FOOD SECURITY AND ATMANIRBHAR BHARAT

Pankaj Seth, Navab Singh, Alok Kumar Pandey and J. Oraon

KVK, Saraikela-Kharsawan, Birsa Agricultural University, Ranchi, Jharkhand
E-mail: psethext@gmail.com

ABSTRACT

Feeding the world in the context of population increase and climate change requires scaling up of technologies and practices that enable more sustainable crop-livestock production and food systems. About 795 million people, or every ninth person, are undernourished, with the majority living in developing countries and rural areas. New and emerging technologies, including synthetic biology, artificial intelligence and tissue engineering may have potential implications for the future of crop and livestock agriculture. However, harnessing the potential of such technologies for food security requires investments in research and development, human capital, infrastructure and knowledge flows.

The potential of stakeholder participation and cooperation for the development of locally adapted veterinary extension research and development strategies could improve livestock production and sustainable consumption. There is an urgent need to increase investment in research and advisory extension services that are coherent with models of productions adapted to smallholder farmers' needs. Research must address a more complex set of objectives: on the one hand, the new challenges (i.e. climate change, renewable energy and energy efficiency, biodiversity and resource management), and, on the other hand, the old challenges (productivity growth and production quality) as well as promotion of diversification. The key message is to break the vicious circle of "poor research and extension for poor farmers". All veterinary education and research, ultimately aims at increased productivity and economic well-being of farmers. Non-availability of sufficient extension personnel is a major constraint. To overcome these shortcomings, e- Veterinary Extension (eVE) is the alternative. It is important to rejuvenate the Veterinary Extension System (VES) with innovative information communication technology (ICT) models for knowledge generation and dissemination. Latest digital technologies are playing vital role to empower farmers to scale up for reaching the required target of food production with special reference to Indian scenario.

SCIENTIFIC METHOD OF NURSERY MANAGEMENT FOR HIGHER INCOME OF VEGETABLE GROWERS AND NUTRI-SMART GARDENS.

Rekha Tiwari , D.S.Tomar, R.P.Sharma and S.K.Kaushik

Senior Scientist, Krishi Vigyan Kendra, (RVSKVV), Ujjain (M.P.)
Email: rekhaup_2007@rediffmail.com

ABSTRACT

Nursery is a protected area where the plants are propagated and maintained in the initial period of their life time. Most of the horticultural crops are raised in nurseries and then transplanted in the field. The nursery ensures better germination and establishment and also ensures saving of time, area and labour and makes easy maintenance. Nursery management requires knowledge of propagation methods and resources such as land, mother plants/ seeds and plant propagation structures, growing media, containers, and mixture for containers, propagation equipments. It is well known that cost of vegetable seeds are very high, particularly the hybrid seeds. Hence, farmers should know the importance of each seed & they must take care of it. Lack of technical knowhow leads to high mortality and ultimately a huge loss to farmers.

Krishi Vigyan Kendra, (RVSKVV), Ujjain assessed the most viable technologies at the farmers field for nursery management particularly to aware the farm women who not only take care of agricultural activities but also have the dual responsibility of eradicating the malnutrition. Four treatments were taken, T1 -Existing Practice, T2-Raised Bed Nursey, T3-Low Tunnel Net House on raised bed and T4-Pro Tray (Plug Tray). Total 70 farm women were selected from adopted cluster area and nutri smart village for conducting the trials of Nursery Management. Results revealed that plants reared in T3 were best with regards to vigour, health, root shoot ratio and crop growth rate. The menace of white fly was in control B:C ratio in T3 was 1:3.9 because the mortality rate was negligible. Thus, it can be concluded that tender plants are well nourished and protected in nursery area which in turn facilitate better seed germination and healthy seedlings production resulting ultimately in reduced seed rate and improved yield and quality of the produce.

STANDARDIZATION AND DEVELOPMENT OF VALUE ADDED LOW GLYCEMIC INDEX LITTLE MILLET (PANICUM SUMATRENSE) BASED *CHAKLI*

D.C.Shrivastava*, S.Pannase, **S.P. Mishra and R.K Jhade

Krishi Vigyan Kendra Chhindwara, Jwaharlal Neharu Agricultural University,Jabalpur (M.P.),
**Mahatma Gandhi Chitrakoot Gramodaya Vishwavidylaya ,Chitrakoot,Satna (M.P)
Email: dcshrivastava@ jnkvv.org

ABSTRACT

Chakli is a popular deep fried snack food commonly made from rice and green gram dhal. In the present investigation, Firstly, *Kutki*, grains were dehusked and debranned by commercial Vivek millet thrasher. *Chakli* were made from Little millets variety JK-8 with green gram dhal in proportion 2:1.The obtained results showed that all the products revealed more or less same values (7.5 to7.9) with respect to various sensory attributes. However product made from 2:1 proportion contained higher values for various sensory attributes.

The nutritional composition of ready-to-eat *chakli* revealed that the products made from various cultivars viz., JK-8 were found to contain average 10.33% protein, 19.2% fat, 56.5% carbohydrates, 1.33% ash, 6.26% crude fiber. For estimation of glycaemic index, an amount of noodles (testfood) and reference food (glucose) supplying 25g of carbohydrate were served on different days.Capillary blood glucose was measured by finger-prick at 0, 30, 60, 90 and 120 min after consumption. The glycaemic index of little millet -pulse chakli (35.65) and were significantly less than plain chakli (42.07). Thus, the developed *chakli* with low glycaemic index can be recommended for inclusion in diabetic diet. The instant *chakli* flour made from *Kutki* and Green_-_gram in the ratio of 2:1 was also stored in these containers for the period of 2 months .The amount of free fatty acids in the samples during storage did not exhibit any significant variations in different containers and the value were found to vary from 0.23 to 0.35% . The sensory evaluation of *chakli* made from stored flours revealed a good performance of the products and value for flavour, taste and overall acceptability of the products were found to vary in the range of 7.4 to 8.0. Hence, it was concluded that *chakli* flour could be well stored in any containers without deterioration of quality for a period of 2 months. Thus from nutritional and sensory point of views, *chakli* made from *kutki* minor millets in the ratio of 2:1could be considered as best.

STORAGE STUDY OF AEROBICALLY PACKAGED FIBRE ENRICHED LOW FAT KADAKNATH CHICKEN PATTIES

P Chauhan and N K Nayak*, A Dubey, D Patel, S Dawar

Department of Livestock Product Technology, College of Veterinary Science and Animal Husbandry, (NDVSU), Mhow, Indore (MP) 453446, India
Email: nayaknarendra2@rediffmail.com

ABSTRACT

The fibre enriched low fat kadaknath chicken patties were packaged aerobically and evaluated for storage stability under refrigeration. The pH, TBA and FFA values of treated patties were lower as compared to control throughout the storage. A progressive and significant ($P<0.05$) increment in the pH, TBA and FFA values of control as well as fibre enriched low fat kadaknath chicken patties were observed with the advancement of storage in aerobically kadaknath chicken patties. The total plate count (TPC) followed a significantly ($P<0.05$) increasing pattern from 0 to 12 day in aerobic packaging in control as well as fibre enriched low fat kadaknath chicken patties. The psychotropic counts as well as Yeast and Mold count under aerobic packaging were not detected up to 9 day of storage either in control or in fibre enriched low fat kadaknath chicken patties and these were detected on 12 day of storage. The coliform were not detected during the entire period of storage in aerobic packaging. Sensory attributes under storage study did not have any significant ($P>0.05$) difference between control and fibre enriched low fat kadaknath chicken patties on all storage days of aerobic packaging. The mean scores for all the sensory attributes for both control as well as fibre enriched low fat kadaknath chicken patties decreased gradually with increasing storage period. Fromthe study it was concluded that the fibre enriched low fat kadaknath chicken patties may be considered as health full product which was very well stable and accepted up to 12 day in aerobic packaging under refrigeration.

WHEAT GRAIN STORED IN PRO SUPER BAG: EFFECT OF MOISTURE, WEIGHT AND COST OF STORAGE OF GRAIN

Moni Singh and Manish Kumar

KVK Ujjain, M.P., KVK, Dewas, M.P.
Email:- m_jadon@rediffmail.com

ABSTRACT

Wheat (Triticum spp.) occupies the prime position among the food crops in the world. However postharvest grain losses caused by insect pests during storages pose a major constraint to household food security. Hermetic storage technology is an alternative method that minimizes postharvest losses. Thus, it may offer a safe, pesticide-free, and sustainable storage suitablefor many commodities and seeds, particularly inhot andhumid climates. Pro Super bag is a farmer friendly 70 kg storage bag that allows cereal grains to be safely stored for extended periods by using the hermetic storage principle. The Pro Super bag fits as a liner bag inside a conventional storage bag and can therefore be used in ways similar to existing bag storage systems.

The objective of this study was to determine the effect of hermetic storage in the pro Super bag compared with traditional storage on the quality of wheat seed stored for 6 months. This study was carried out by Krishi Vighyan Kendra, Dewas, M.P. for three consecutive years from 2016-17 to 2018-19 in the three village of operational area i.e. Narana , Agera and Chandana. The result showed that thedevelopment The moisture content of wheatgrain in pro super bags obtained 9.5percent while in traditional way 14.9 percent. Recorded the lowest insect density (6.5weevil/kg grain) in pro super bag while traditional bags had the highest (12.80weevil/kg grain).The effectiveness of grain storage is greatly influenced by storage period and weight loss during storage duration. The weight loss levels observed in the bags are attributed to insect population in the bags. Wheat grains stored in pro Super bags maintained low weight loss (43.2) compared to the equivalent grains in traditional bags (41.0) at 6 months after storage. During year 2018-19 highest Net profit (Rs. 829.40), was recorded as compared to traditional practice (756.60) and average net profit were calculated in pro super bag was Rs.714.0 and \traditional was 655.4.The study confirms the effectiveness of pro super bag as a storage method. The initial grain moisture content remained unchanged, while in traditional bags, it reduced.

STUDY ON EFFECT OF SUPPLEMENTARY FEEDING ON GROWTH PERFORMANCE OF INDIAN CARPS IN FARM PONDS IN BUNDELKHAND REGION OF MADHYA PRADESH

Y. C. Rikhari, Puneet Kumar, Sanjay Kumar

Krishi Vigyan Kendra, Datia, M.P.
Email:rikhari@gmail.com

ABSTRACT

Fish farming in farm ponds may be an additional source of income and employment in rural areas of Bundelkhand region. The study was conducted by the Krishi Vigyan Kendra, Datia, M.P. in the form of demonstrations on topic entitled "Effect of Nutritional management by supplementary feeding on growth performance of Indian Major Carps in composite fish culture practice". The trial was conducted in 03 farmer's ponds under farm field condition for 07 months (Sept- Mar). The data were collected from each pond to check the growth rate, fish production and economic profitability of fish culture in Datia district. The generated data were used for the calculation of gross return, net return and ultimate B: C ratio. Better fish production 1558.50 kg/ha and more economic return Rs. 75129/- was observed through regular supplementary feeding as compare to without supplementary feeding in farmer's practice. Specific growth rate of *Catlacatla* was maximum followed by *Cirrhinusmri*gla and *Labeorohita*. Thus, fish farmers can get higher economic return by adopting composite fish culture with supplementary feeding practice.

NUTRIENT COMPOSITION AND EFFECT OF SUPPLEMENTATION OF BLACK CUMIN SEEDS ON PRODUCTIVE, REPRODUCTIVE PERFORMANCES AND IMMUNITY STATUSIN SMALL RUMINANTS: A META-ANALYSIS

Amit Kumar Singh, Sanjeet Kumar, Anil Kumar, Sandeep Kumar, Sanjay Kumar

ICAR- Krishi Vigyan Kendra, Amihit, Jaunpur, Acharya Narendra Dev University of Agriculture & Technology, Ayodhya, U.P.
Email: amitkumarsingh5496@gmail.com

ABSTRACT

Herbs have been traditionally used in food and medicines due to their flavoring and medicinal values. Black cumin seeds are rich in phenolic compounds that have anti-oxidant, anti-microbial, increasing nutrient digestibility and availability which enhances overall performances of small ruminants when supplemented in recommended levels. Thymoquinone is the principle phenolic compound present in black cumin seeds. Furthermore, black cumin seeds are rich in protein (around 30%) and oil content (30-40%) which may be beneficially utilized in animal feeding. Some studies also showed that black cumin seeds may be utilized to replace other protein rich ingredients in animal feeds. This study was done to evaluate the effect of different levels of black cumin in goats and small ruminants on productive, reproductive performances and immunity status. Result of this meta-analysis study done from considering suitable studies done from 2005 to 2021 revealed that dietary supplementation of black cumin seeds may significantly improve body growth (P<0.05), nutrient utilization (P<0.05), milk production (P<0.05), immunity status (P<0.05) and reproductive performance of small ruminants (P<0.05). However, some studies have shown no change in feed intake by small ruminants (P>0.05). It may be concluded that, dietary supplementation of black cumin seeds may improve nutrient utilization, growth performance, milk production, immunity status and reproductive performance of small ruminants.

M1

A STUDY ON BACKYARD POULTRY PRODUCTION SYSTEM AND ITS PRODUCTIVITY ENHANCEMENT WITH IMPROVED BIRDS IN WEST GARO HILLS DISTRICT OF MEGHALAYA

Sagarika Borah* and Tarun kr. Das

ICAR-Krishi Vigyan Kendra, Tura, West Garo Hills, Meghalaya
*Email: sagadikaborah31@gmail.com

ABSTRACT

Backyard poultry production plays an important role in rural economy in the West Garo Hills district of Meghalaya. The present study was carried out to analyze the low input backyard poultry production system practiced by the Garo farmers, their socio-economic status and productivity enhancement of backyard poultry through rearing of Kuroiler birds in the district. The study was conducted with randomly selected 180 respondents from 12 villages under six blocks (two villages in each block) of West Garo Hills district and on 600 Kuroiler birds in the period of two years (2019-21). The findings showed that majority (84.44%) of the backyard poultry keepers in West Garo Hills district were middle-aged women and they played a significant role in backyard poultry production that contributes towards their family's subsistence. The results also showed that majority of the farmers (85%) reared local chicken and the production potential of this local chicken is very low in comparison to Kuroiler birds. The average live weights at 4^{th} (410.6±4.22g) weeks and 8^{th} weeks (748 ±6.64g) were higher in Kuroiler than indigenous local birds under the same rearing system. The average annual egg production in kuroiler birds was recorded as 113.17±1.55 numbers where as in local birds it was only 42.07±0.86 numbers. However, the mortality rate during brooding period was higher in Kuroiler than its local counterpart. The findings of the present study indicate that backyard poultry production is a way of improving rural income as well as empowering rural women. It also indicated that Kuroiler chicken enhanced the productivity of backyard poultry leading to increased income of the tribal farmers in rural areas of Meghalaya and thus can provide a solution to food security to the tribal farmers paving a way for sustainable farming system.

CASE STUDY ON THE IMPACT OF PRODUCTION ISSUES ON DAIRY FARMING

A.K. Singh, A.K. Sharma, Neha & Rajesh

Krishi Vigyan Kendra, Dehradun
G.B. Pant University of Agriculture & Technology
Email:kvkdehradun@gmail.com

ABSTRACT

The Study of 376 dairy farm animals on feeding of mineral mixture and probiotics located in various C.D. Block of district Dehradun during year 2020 - 2021 under the AMRIT project implementing at KVK Dehradun. The socio-economic status, as well as information on milk production, prevalence of diseases, and impact of vaccination, during the study period. The animals were fed mineral mixture, probiotics and suitable medicines prescribed by veterinarians for treatment. Most of the animals in the farms also access to veterinary care, operation and maintenance of the dairy farms (labor, cleaning agents and schedule, kind of feed, use of leftover roughage and concentrate), The milk production, and, infrastructure (floor, ventilation, shape of manger edges, animal housing system, drain lining, management of solid waste and wastewater from dairy farms, The study revealed that prominent diseases namely recorded i.e. Mastitis 21.59% Retention of placenta 20.80%, parasitic Infestation 16.05%, Repeat Breeding 13.73%, Fever 11.62% Diarrhea 7.69%,and FMD 4.85%, of symptoms were majorly. The statistical analysis has indicated that nutrition, shape of manger edge, and cleaning agents affected the prevalence of the most common diseases. During the study analyses the drinking water intake by animals found ph range 6.40-9.30, Total hardness range between 158-324mg/L, whereas alkalinity level recorded 95-242 mg/L while sodium and chloride level range 6.23-13.04 ,65 -190mg/L respectively. Study also documented widespread lack of awareness of veterinary healthcare, management. These observations formed the basis of the during demonstration that were conducted in the year 2020 - 2021. The parallel health care network for dairy animals was unreliable and focused on nearly arbitrary use of antibiotics, even when prevention was an option. Whereas due to absence of awareness regarding prevalent diseases, Farm Infrastructural and type of housing system also correlated with increased prevalence of disease/symptom group were practiced commonly. The farmers with infrastructural and operation and management related issues that were identified during study period.

M3

EFFECT OF SUPPLEMENTARY FEEDING OF SHATAVARI (*ASPARAGUS RACEMOSUS*) ROOTS POWDER ON MILK PRODUCTION PERFORMANCE OF LACTATING BUFFALOES

B.S. Meena[1*], R.K. Bairwa[2], R.R. Meena[2] and Mukesh Choudhary[2]

[1]Krishi Vigyan Kendra, Hindaun, Karauli, Rajasthan 322230
[2]Krishi Vigyan Kendra, Kota, Rajasthan 324001
Email: bs_meena38@yahoo.com

ABSTRACT

KVK, Karauli conducted on-farm testing to assess the efficacy of supplementary feeding of shatavari roots powder on milk production performance of lactating buffaloes. Total 10 lactating buffaloes were of second lactation were selected which were parturient within 1 to 4 months. The selecting buffaloes were fed 50 grams per day per buffalo supplementary feeding of shatavari root powder with balance concentrate ration @ 1 kg /2.5 litter milk along with 1 kg for maintenances for the period of 120 days. The milk yield was recorded 9.2 litter/day with cost benefit ratio of 1.90 which was higher than farmers practices.

M4

ENTREPRENEURSHIP DEVELOPMENT IN FARM WOMEN THROUGH VALUE ADDITION IN MANGO

R A Gurjar, Nital N Patel, S R Salunkhe and N M Chauhan

Navsari Agricultural University, Navsari- 396450 (Gujarat)
Email:rashgurjar@gmail.com

ABSTRACT

For Mango cultivation Navsari district comes second in Gujarat with 33845 ha area and 147564 MT production of mango. However, even after production of such huge quantity value addition of mango is very less. Mango processing can provide unexplored opportunities to take up new enterprises. To provide additional income to women farmer and to develop confidence of quality product KVK Navsari started work with the help of PHEC of NAU, Navsari on difficulties faced by the farmer during mango value addition and how to resolve it by expert's advice.

Different types of training *e.g.* motivational, technical, problem solving webinar, ethics, branding, marketing and selling were organized. An overwhelming response from the women farmers was achieved twenty six trainings has been given and more than 300 people learned proper method of mango value addition. From the different method of value addition, mango pulp bottling has given the best response in selling and profit point of view. Since the starting of the project 10 entrepreneurs are doing business with profit of 5,88,000 with cost of 1,96,000. Total 9,800 bottles were prepared and with cost of 20 rupees per bottle, which was sold at 80 Rs per bottle in market with total income of 7,84,000 Rs.

FEEDING OF AZOLLA MICROPHYLLA TO KADAKNATH BIRDS FOR THEIR GROWTH, SURVIVABILITY AND EGG PRODUCTION

Chandan Kumar* , I S Tomar, J Morya and Anil Kumar Sharma

Krishi Vigyan Kendra, Jhabua (M.P), RVSKVV Gwalior (M.P)
Email:vetchandan@gmail.com

ABSTRACT

Kadaknath is an uncommon black meat chicken (BMC) breed of India. They have a dominant gene (*EDN3 gene*) that causes hyper-pigmentation (fibromelanosis), making the chicken mostly black, including feathers, beak, tongue, and other internal organs. The main problem with this bird is slow growth rate, high mortality and low egg production in intensive as well as in farmer's field. The aim of this trial was to study the effect of azolla (*A. Microphyla*) on kadaknath birds for their growth, survivability and egg production. Azolla is a free floating water fern that floats in water and fixes atmospheric nitrogen in association with the nitrogen fixing blue green alga, *Anabaena azollae*. Azolla is very much used as a sustainable feed substitute for livestock especially dairy cattle, poultry, piggery and fish. Azolla contains 25-35% protein on dry weight basis and rich in essential amino acids, minerals, vitamins and carotenoids including β-carotene. On a dry weight basis, azolla has 25-35% protein content, 10-15% mineral content, and 7-10% comprising a combination of amino acids, bio-active substances and biopolymers.To find out the impact of Azolla microphylla as a feed supplement to kadaknath birds, fresh Azolla ponds (3'x6') were used for experiments. In $T_{1\ (control)}$ Fifty kadaknath birds (4 week old) which were fed normal commercial feeds, T_2 group along with basal commercial diets @ 5% extra supplementary feed (fresh azolla) were fed to kadaknath birds, and in T_3 group 5 % replacement (dry matter basis) of commercial feeds were given. The growth rate and egg production, mortality rate, morbidity rate was recorded periodically for all the three groups of the experiments. The data on growth rate, mortality rate and the egg production, morbidity rate showed significant changes in Azolla fed birds as compared to control groups. Azolla Microphylla fed kadaknath birds showed higher income generation as compared to normal commercial fed kadaknath birds from farmers point of view.

IMPACT OF TRAINING ON KNOWLEDGE LEVELS OF GOAT REARING FARMER'S IN BUNDI DISTRICT OF RAJASTHAN

G.S. Meena*#, Deepak Kumar*, K. Mahajani*, R.K. Bairwa, Anita Kumari Meena*** and R.K.Meena******

*#&*Krishi Vigyan Kendra, Bundi; ** Krishi Vigyan Kendra, Kota
Rajasthan College of Agriculture, Udaipur;* Krishi Vigyan Kendra- Hindaun
*#Email address: ghanshyam774@gmail.com

ABSTRACT

Goat husbandry is one of the important enterprises that enhance the income of rural households by providing gainful employment. To measure the farmer's knowledge towards goat farming. Present study was conducted on the goat farmers in Bundi District of Rajasthan those participated in the trainings on goat farming organized by KVK Bundi during 2020 and 2021. Seventy two trainees of goat farming were selected for pre and post training evolution test. All the goat farmers were imparted more than10 day's trainings on different aspects of goat farming. The study revealed that 26.16, 40.27 and 22.22 per cent respondents were educated up to middle, metric and senior secondary level, respectively and only 8.33 per cent trainees were completed graduation. Before training, only 2.94 per cent of the trainees having high level of knowledge and 79.41 per cent belongs to low level of knowledge on goat farming. After got training 70.58 per cent ($P<0.01$) of farmers were possessed high level of knowledge and 23.52 per cent trainees were possessed moderate level of knowledge towards improved goat husbandry practices. The awareness perceived by farmers about breeding, feeding, health, marketing and housing management was significantly ($P<0.05$) higher after training. The study suggests that the frequencies of such training programmes (more than10 days) are more beneficial to farmers for improving their knowledge and attitude towards successful goat farming in the district.

MANAGEMENT OF MASTITIS IN CROSSBREED COWS IN RAJASTHAN

B.S. Meena[1*], R.K. Bairwa[2], R.R. Meena[2] and Mukesh Choudhary[2]

[1]Krishi Vigyan Kendra, Hindaun, Karauli, Rajasthan 322230
[2]Krishi Vigyan Kendra, Kota, Rajasthan 324001
Email: bs_meena38@yahoo.com

ABSTRACT

Dairying plays an important role for the welfare of the rural people. Mastitis is an infection of udder caused by micro-organisms entering the quarter through the teat end. There was high incidence of mastitis disease in crossbreed cows resulting in lower productivity and profitability of crossbreed cows in the district. An on-farm testing (OFT) was carried out by KVK, Karauli to assess the efficacy Potassium Permanganate ($KMNO_4$) Solution plus use of Povadin iodine solution immediate after milking. The results revealed that under assessed practice the milk yield was increased by 1.30 lt./day/animal with cost benefit ratio 1.62 which was higher than farmers practices.

MITIGATING MALNUTRITION BY INTRODUCING VALUE ADDED UNDERUTILIZED FRUITS

Shalini Chakraborty[*] and Rupendra Khandwe

Krishi Vigyan Kendra, Rajgarh(RVSKVV, Gwalior)
Email: shalini17576@gmail.com

ABSTRACT

Fruits like mango, apples, banana, guava, citrus fruits, are available in plenty due to their distinct flavor and taste. Underutilized fruits like aonla, ber, jamun, karonda, bael, tamarind, chironjee etc. provide essential micro-nutrients and thus complement staple foods. Many underutilized fruits are high in carotenoids and minerals and therefore could play a role in helping to improve the micro-nutrient content in the diets of millions of people.

It is widely accepted that increased consumption of locally available indigenous or traditional fruits, vegetables, grains, roots and tubers can improve nutrition and increase human productivity. Many underutilized fruits have the potential to contribute to food security at local and regional levels. In an increasingly globalized and interdependent world, eradicating hunger is a prerequisite for peace and world security. Trainings in value chain development for these fruits is important as to increase the consumption. Thus, value added Underutilized fruits have tremendous opportunities for fighting poverty, hunger and malnutrition and can help make agricultural production systems more resilient to climate change.

NUTRIENT COMPOSITION AND EFFECT OF SUPPLEMENTATION OF BLACK CUMIN SEEDS ON PRODUCTIVE, REPRODUCTIVE PERFORMANCES AND IMMUNITY STATUS IN SMALL RUMINANTS: A META-ANALYSIS

Amit Kumar Singh, Sanjeet Kumar, Anil Kumar, Sandeep Kumar, Sanjay Kumar

ICAR- Krishi Vigyan Kendra, Amihit, Jaunpur 2, Acharya Narendra Dev University of Agriculture & Technology, Ayodhya, U.P.
Email: amitkumarsingh5496@gmail.com

ABSTRACT

Herbs have been traditionally used in food and medicines due to their flavoring and medicinal values. Black cumin seeds are rich in phenolic compounds that have anti-oxidant, anti-microbial, increasing nutrient digestibility and availability which enhances overall performances of small ruminants when supplemented in recommended levels. Thymoquinone is the principle phenolic compound present in black cumin seeds. Furthermore, black cumin seeds are rich in protein (around 30%) and oil content (30-40%) which may be beneficially utilized in animal feeding. Some studies also showed that black cumin seeds may be utilized to replace other protein rich ingredients in animal feeds. This study was done to evaluate the effect of different levels of black cumin in goats and small ruminants on productive, reproductive performances and immunity status. Result of this meta-analysis study done from considering suitable studies done from 2005 to 2021 revealed that dietary supplementation of black cumin seeds may significantly improve body growth (P<0.05), nutrient utilization (P<0.05), milk production (P<0.05), immunity status (P<0.05) and reproductive performance of small ruminants (P<0.05). However, some studies have shown no change in feed intake by small ruminants (P>0.05). It may be concluded that, dietary supplementation of black cumin seeds may improve nutrient utilization, growth performance, milk production, immunity status and reproductive performance of small ruminants.

NUTRITIONAL INTERVENTION FOR PROFITABLE DAIRY FARMING IN MIZORAM: FEEDING PRACTICES AND NUTRITIONAL STATUS OF DAIRY COWS UNDER RURAL FEEDING MANAGEMENT IN MIZORAM

Rajat Buragohain[1*]

Department of Animal Nutrition
College of Veterinary Sciences and Animal Husbandry
Central Agricultural University (Imphal)
Selesih, Aizawl, Mizoram – 796015
Email: drrajat57@gmail.com

ABSTRACT

The study assessed feeding practices and nutritional status of dairy cows under rural feeding management in Mizoram. Information about feeding practices of dairy cows were collected from randomly selected dairy farmers of Aizawl district of Mizoram and feed-stuffs fed to the animals were collected following standard sampling techniques for nutritional analysis. Blood samples were collected for analysis of minerals. For the estimation of apparent digestibility coefficient of feeds offered to the animals, random samples of feed mixture and faeces were collected. The apparent digestibility coefficients were calculated by indirect method. For analysing the feeds and faeces samples, AOAC (2012) methods were used and serum macro and micro mineral contents were estimated by Atomic Absorption Spectrophotometer following standard protocols. Study revealed that the farmers generally feed commercial concentrate feed available in Aizawl city and sometimes dairy mixture supplied by Government Animal Husbandry department at subsidised rate. The average dry matter (DM%), protein (CP%), energy (TDN%) of concentrate mixture and roughages were estimated as 90.08±0.08, 17.21±0.13, 68.11±0.25 and 27.05±0.55, 9.86±0.11, 38.64±0.28, respectively. The average DM, CP and TDN intakes were 16.06±0.27, 2.11±0.03 and 8.48±0.10 kg/animal/day. The findings indicated sufficient intakes of dry matter, protein and energy considering the average body weight, milk yield and milk fat % of the dairy cows. The concentrate mixture and mixed roughages were estimated to be rich in macro- and micro-minerals. The average apparent digestibility coefficient of nutrients of the feeds offered to dairy cows was poor, particularly of CP (49.39±0.80 - 53.27±1.07%) and EE (44.50±0.94 - 52.16±0.53%).

PERFORMANCE OF VANARAJA BIRDS UNDER BACKYARD POULTRY IN EAST GARO HILLS, MEGHALAYA

Brijendra Singh Rajawat[1*], Zosangpuii[2] and Trudy Tengse A. Sangma[3]

Krishi Vigyan Kendra, Megagre, East Garo Hills (Meghalaya)
Central Agricultural University, Imphal (Manipur) India
Email:drbsrajawat@gmail.com, caukvkeastgarohills@gmail.com

ABSTRACT

A study was conducted to evaluate the productive performance of Vanaraja birds under backyard system in East Garo Hills, Meghlaya. A total of 600 day-old chicks of Vanaraja breed were procured and were distributed to 20 farmers (20 female & 10 male birds to each farmer) belonging to 5 villages of East Garo Hills district of Meghalaya during 2018-19 to 2021-22. The productive performance of Vanaraja birds were studied and compared with the local birds. The average body weight at 2, 4, 6, 8, 12, 16 and 20 weeks of Vanaraja birds were 133±3.31, 356±1.2, 707±12.5, 946±33.7, 1250±41.2, 1480±45.6 and 1600±21.4gm respectively whereas 120±5.3, 182±10.4, 230±20.7, 295±28.4, 320±33.6, 480 ±30.5 & 598±22.8gm were observed in local birds. There was significant difference in average age at first laying, average body weight at first laying, average annual egg production and average egg weight which were 175±10.5 days, 1.35±0.35 Kg, 130±6.4 eggs and 59±2.6 gm respectively in Vanaraja birds whereas in local birds 225±20.6 days, 958±62.7 gm, 36±9.3 eggs and 45±3.1gm respectively were observed. It was concluded that raising Vanaraja birds under backyard system was more profitable as compared to local birds which could enhance the total income of the farmers and thereby improve their economic status.

REARING PRACTICES AND PERFORMANCE ATTRIBUTES OF ASSAM HILL GOAT IN HILL DISTRICTS OF ASSAM, INDIA

Monuj Kumar Doley, Subal Maibangsa, Manoranjan Neog, Neethi Baruah, Bhrigu Kumar Neog, Luit Moni Barkalita, Prasanna Kumar Pathak

KVK, Karbi Anglong (Assam)
E-mail: monuj.doley.vdk18@aau.ac.in

ABSTRACT

The present study was conducted in the hill district of Assam during April, 2015 to June, 2021 by KVK, Karbi Anglong to gather information on existing management practices of Assam hill (AH) goat and assess their productive and reproductive performances under field conditions. The data were collected through field survey, PRA, focus group discussion, pre-tested interview schedule and records obtained through individual farm visits. The study on breeds and breeding practices indicated that majority of the goat farmers didn't have knowledge on availability of different types of goat breed (94%). The majority of the tribal farmers did not maintained breeding buck (75.50%) and used natural method (100%) of service to doe. A large share of the farmers reared their goat in open grazing/tethering under semi intensive system (89%) followed by semi stall feeding (11%) with provision of temporary house (84%) made of locally available materials (81%). Only, 8% of the farmers had provision of drinking water. The study on feeding practices showed that 94.50% farmers didn't cultivate green fodder and 65.50% farmers didn't provide concentrate feed. The study on different health care practices revealed that 92.50% of the farmers didn't vaccinate and while only 10, 7 and 11 % used antibiotics, deworming and ectoparasitic drugs respectively. Tick/mange/mite infestation, diarrhoea, PPR, *orf*, goat pox and mastitis were reported by 71, 78, 61.50, 47, 30 and 13% of the farmers respectively. The majority of the farmers had flock size of 5-10 (66%) with average litter size of 1.69. The mean body weight gain of Assam Hill goat at birth, 3, 6, 9 and 12 months were 1.61±0.03, 4.62±0.09, 8.48±0.08, 11.75±0.08 and 15.24±0.14 Kg respectively. The mean age at puberty, sexual maturity, length of estrus cycle, first kidding, post-partum estrus period, gestation length were 276.19±1.19, 298.39±0.94, 20.97±0.03, 449.56±0.85, 64.78±0.71, 247.73±0.95 and 147.91±0.16 days respectively. No significant differences were observed in productive and reproductive performances ($p>0.05$) in between the district. From the study it was concluded that goat farming not only provide supplementary income but also considered as an integral part of culture and tradition. The study on productive and reproductive attributes revealed that AH goat were highly suitable and one of the most promising goat germplasm that can be promoted for commercialization for sustainable income generation.

M13

ROLE OF OMEGA FATTY ACIDS IN CANINE HEALTH

R. Nehra , Jagriti Srivastav and Sarita Mahicha

Department of Animal Nutrition,
College of Veterinary and Animal Science, RAJUVAS, Bikaner
Email: drrajnehra@gmail.com

ABSTRACT

Essential fatty acids are regarded as crucial component of balance diet in dog. Omega fatty acid include omega 3 & omega 6 fatty acid. Omega 3 & omega 6 fatty acids are polyunsaturated fatty acids & essential fatty acid in dogs responsible for numerous cellular function including brain development , inflammation, immune system, heart & kidney, skin & coat health and reproductive function. Omega 3 fatty acid mainly includes EPA (Eicosapentaenoic acid),DHA(Docosahexaenoic acid),ALA(alpha linolenic acid) which is mainly found in marine animal. Omega 6 fatty acid include LA(Linoleic acid),GLA(Gamma linolenic acid,AA(Arachidonic acid),DGLA. Obtain from plant & animal source. According to NRC ratio of omega 3& omega 6 fatty acid in diet 2.6 :1 to 26:1 and according to AAFCO ratio should be 30:1.Omega fatty acids have many beneficial effects on overall health of canine so should be given in diet in proper amount and ratio.

M14

SURGICAL REPLACEMENT OF PROLAPSED CLOACA IN INDIAN TENT TURTLE (*PANGSHURA TENTORIACIRCUMDATA,)*

Ranbir Singh Jatav, Shashank Vishvakarma, Nitin Bajaj, Asad Khan and Meenakshi Dawar

College of Veterinary Science & A.H.
South Civil Line, Jabalpur (MP)
Email;hindoliya.ranbir@gmail.com

ABSTRACT

The Indian tent turtle are vulnerable according to IUCN and comes under appendix II of CITES. The species are present in large rivers and may seen in the small tributaries. A case of tent turtle was brought at Tri-V-Vet Clinic with the complaints of prolapse mass hung from the anal region, and this mass was detected to becloaca of turtle. Prolapse of cloaca was occurred with the following causes includes bite wounds from cage mates, traction during copulation, infection, nutritional hyperparathyroidism, inflammation, straining from intestinal parasite, impaction of the cloaca with gastrointestinal foreign bodies (sand, gravel) and feeding of chapati and dough and bladder or cloacal uroliths. The clinical examination was concluded that surgical replacement of cloaca was the choice of treatment. In conclusion, replacement of cloaca in this turtle was found to be successful with no complication.

TRADITIONAL METHOD OF MITHUN PRODUCTION SYSTEM IN ARUNACHAL PRADESH - AN EXPLORATORY STUDY

Tilling Tayo1* and Neeta Longjam2,

1KVK–Longding, ICAR A.P center Basar for NEH region
2KVK-East Siang, CHF Pasighat, Central Agricultural University (CAU), Arunachal Pradesh.
Email: tilling.tayo@gmail.com

ABSTRACT

Mithun (Bos Frontalis) is considered as a majestic Gold of Arunachal Pradesh because of its Socio Culture, Economic and religious important. Three systems of rearing are practiced, free-range, tethering and lura systems. Free range system are most prevalent method of rearing, followed by tethering system during treatment or introduce into new environment/place or to tame the mithun, while lura system synchronize agriculture cultivation system, thereby mithun are kept inside community based enclosure to prevent crops raid. No any extra shed is constructed for mithun, no any provision of health care like vaccination or deworming, except few farmer vaccinated their mithun for FMD, no extra feeds are offered except for common salt. Breeding is done by natural mating under favorable condition in forest. Identification mark is done by ear notching. Fallow jhum is good source of 14 different kind of fodder for mithun, while some farmers practice of rejuvenation of fodder by burning dry biomass of hillock during dry season (Nov-Dec). Tenant system of caring mithun is followed, as a dual owner of mithun, the tenants get 1 calf after every 2 calf born for absolute owner of mithun. Due to tenants system of caring and exchange of mithun during bridal gift within inter village to inter district practices may reduce inbreeding depression along with conducive, vast grazing forest area. These three factors are considered to be the reason for continuous increasing in mithun population in Arunachal, in contrast to decline mithun population in other state. 90.6% of mithun population of India is found in Arunachal. However, it is astonish to note that there is no any Research Centre or Sub Centre on Mithun is establish in Arunachal, despite highest populations and mithun being consider as corner stone for livelihood improvement of tribal society of Arunachal Pradesh.

EFFECTIVENESS OF TRAININGS ON ADOPTION BEHAVIOUR OF PIG FARMERS

Madhu Shelly and Manoj Sharma

Directorate of Extension Education
Punjab Agricultural University, Ludhiana 141 004(Punjab)
Email: gmshelly786@pau.edu

ABSTRACT

In order to evaluate the trainings imparted on pig farming with an emphasis on recommended pig farming practices and technologies, 140 farmers who acquired trainings offered by Krishi Vigyan Kendra, Muktsar were interviewed after a period of six months with the help of a pretested interview schedule. The study revealed that majority (54.29 %) were under 30 yr of age, most respondents (37.86 %) had higher secondary (10+2) qualification and as many as 35 percent were graduates and above. It was also observed that majority (64.29%) had annual income between 1-6 lakh/annum. As far as land holding was concerned, 55.71 % had land between 0.5 to 2.0 ha. All those who started pig farming enterprise, adopted exotic breeds, vaccination, deworming and shed provision for pigs fully. However, fewer farmers adopted tail docking as many considered it was not required because sometimes tail helped to catch hold of pigs. Mean adoption score was highest for high school category ($40.94^{a} \pm 7.28$). Training and capacity building are therefore, must to increase knowledge and awareness, however adoption behavior is dependent on many other factors like societal perception.

FEEDING STRATEGY FOR LAYING HENS TO COUNTER LOW EGG PRICES IN THE MARKET

Manoj Sharma, Tejbeer Singh and Gurinder Singh

Krishi Vigyan Kendra, Langroya, SBS Nagar (Punjab)
Email:drmanojsharma2021@gmail.com

ABSTRACT

The present study was conducted to reduce the cost of feeding in laying hens by mixing easily available feed ingredients with a farmer so that cost of egg production can be reduced and in turn margin of profit increased. A complete layer mash (crumbles) purchased from the local market costing Rs. 29/kg. was used as control diet (T1). This diet (T1) was replaced with 10 and 20 per cent each of ground maize and broken rice at the time of feeding daily. Thus, a total of 5 experimental diets were prepared as T1 (control), T2 (T1+ 10 % ground maize), T3 (T1+ 20 % ground maize), T4 (T1+10% broken rice) and T5 (T1+ 20% broken rice). All 5 experimental diets were fed to 5 groups of layers with 20 hens in each group. Thus, a total of 100 laying hens were used for this experiment. All the birds were housed in individual cage and fed individually for a period of 90 d during the months of February to April, 2021. The results revealed that feeding cost per hen during 3 m period came out to be Rs. 261, Rs. 256, Rs. 248, Rs.247 and Rs.233 in groups T1, T2, T3, T4 and T5, respectively and there was a saving of Rs.5, Rs. 13, Rs. 14, and Rs. 22 per hen in groups T2, T3 T4 and T5 as compared to T1 when diet was mixed with maize (10%), Maize (20%), broken rice (10% and broken rice (20 %). Therefore, this strategy can be helpful during the period when there is very high feed cost and low egg price in order to save expenditure on feeding of hens. On the other hand, when net profit calculated, it was found that maximum profit was in control group (T1) followed by T2, T3, T4 and T5. The reduction in net profit was due to a smaller number of eggs laid by birds of T2, T3, T4 and T5 group.

N1

ADOPTION LEVELS OF ANDHRA PRADESH DAIRY FARMERS OBTAINING INFORMATION FROM YOUTUBE AND WHATSAPP – A COMPARATIVE STUDY

Mithun G., Triveni G., Sharma G.R.K, and Ravindra Reddy Y.

Department of Veterinary and Animal Husbandry Extension Education,
College of Veterinary Science, SVVU, Tirupati. 517502
Email:urstrulymithun1432@gmail.com

ABSTRACT

Adoption of dairy husbandry practices is influenced by the information sources. The purpose of this study is to better comprehend the impact of information sources on adoption levels of dairy husbandry practices. Six villages in the Andhra Pradesh districts of Visakhapatnam, Prakasam and Chittoor were chosen at random for the study. Twenty dairy farmers were chosen at random from each village, and they were divided into two groups of ten in accordance with how frequently they used WhatsApp and YouTube for information. Farmers who primarily rely on WhatsApp were assigned to one group, while those who primarily rely on YouTube were assigned to another. Thus, 60 farmers who utilize YouTube and 60 farmers who utilize WhatsApp comprised the sample. It was noticed that only 13.33 percent of YouTube group farmers and 23.33 percent of WhatsApp group farmers had low adoption levels, whereas 11.67 percent of YouTube and 10 percent of WhatsApp group farmers had high adoption levels of dairy husbandry practices. Based on the findings, it can be concluded that YouTube group farmers had comparatively greater adoption levels than WhatsApp group farmers. This was because the majority of respondents who are involved in the study mentioned that the information shared through YouTube was more succinct, apparent and appealing than that shared on WhatsApp. In essence, YouTube has a substantially more ability to influence the knowledge, adoption levels and attitude of the targeted audience than WhatsApp.

CONSTRAINTS IN ACHIEVING HIGH YIELD OF WHEAT IN MALWA PLATEAU OF MADHYA PRADESH

S K Kaushik R P Sharma D S Tomar and Rekha Tiwari

Krishi Vigyan Kendra-Ujjain (MP)
(Rajamata Vijayaraje Scindhia Krishi Vishwa Vidyalaya-Gwalior)
E-mail:Kaushik.surendra@rediffmail.com

ABSTRACT

The present study was conducted in 6 villages of Ujjain district of Malwa plateau during rabi 2019-20. A total of 24 wheat growing farmers were selected for the study. The constraints were categorized in nine classes for ease of the points to be understand. In this study, it is observed that inception of loose smut and Yellow rust in diseases, termite and aphid attack in insect-pest, emergence of Phalaris minor and *Avenaludoviciana* (Jangali Jai)in weed infestation, declining water table and high temperature at maturity under abiotic stresses, non-availability of labour and small land holding under Socio-economic structures, lack of irrigation facilities and high cost of inputs, low organic matter and imbalanced use of fertilizers under technological category, Poor information delivery by state extension machinery and Poor participation in exposure visits arranged by various departments under extension, low price of produce and attack of rodents were major constraints that hinders the yield potentiality of wheat. Wheat production not only faces the above challenges, but the intensity gets magnified in the context of climate change owing to its vulnerability. The study suggested that with all the present technical know-how, we can enhance the wheat production and productivity if we can focused on improving the constraints discussed in this study.

IMPACT AND KNOWLEDGE ASSESSMENT OF ENTREPRENEURIAL TRAININGS UNDER ARYA PROJECT FOR BOOSTING UP THE NEW ENTREPRENEURS IN NEEMUCH (M.P)

P.S Naruka, Shilpi Verma, S.S.Sarangdevot, C.P.Pachauri and J.P.Singh

KVK Neemuch
Email:acshilpi@gmail.com

ABSTRACT

Krishi Vigyan Kendra designs different kinds of training courses for the farmers/ farm women/rural youth. The location of the study was Krishi Vigyan Kendra, Neemuch because initially Attracting and Retaining Youth in Agriculture (ARYA) project was implemented through KVKs in 25 states of the country. Under, ARYA project, Value addition in seed spice crops is the major aspect chosen for the present study. Total 100 respondents were taken for the study. The data was collected and analysed from trainees with the help of well structured interview schedule cum questionnaire. With this context, the present study has been carried out to know the Knowledge of beneficiaries about recommended Value addition in seed spice crops practices under ARYA project. The results of the study revealed that 47 farmers (47%) showed interest in establishing their own enterprise after acquiring the training. Results also showed that 72.00 per cent of beneficiaries had medium knowledge level followed by low level and high level of knowledge category. Among recommended Value addition in seed spice crops practices, farmers had more knowledge in grading and sorting practices with first rank with MPS 72.22 by beneficiary followed by grinding practices (MPS 64.44 by beneficiaries) and newer product development and machines practices (MPS 62.00 by beneficiaries). Entrepreneurial trainings like these played an important role in developing the skills among the rural youths and also benefiting them for income generation. Skill training programmes are very useful to the rural youth to earn their livelihood through subsidiary occupations and improve agriculture income with the development supplementation of this income.

IMPORTANCE OF AGRO BASED ADVISORY SERVICES IN SEED PRODUCTION PROGRAMME VIA DISTRICT AGRO METEOROLOGICAL UNIT

I.S. Mirdha, V.K. Jain, B.S. Gupta, H.K. Trivedi

Krishi Vigyan Kendra, Ashoknagar
Email: kvkashoknagar@rediffmail.com

ABSTRACT

Agro based advisory services plays a major role in seed production programme. Activities like seed germination, inter cultural operation, harvesting etc. depends on whether condition of the specified region. Likewise seed germination mainly depends on temperature, light availability, air availability and proper soil temperature. To provide region based information on whether and its parameter Govt. of India Ministry of Earth Science in collaboration with department of Indian Meteorology established automatic weather station to monitor local rainfall, temperature, wind speed, sunshine hours, humidity recorded automatically. In these weather station local weather information in every 15 min directly transfer to IMD Pune. Using these database every Tuesday and Friday, a weather based advisory released at local level to farmer of the concern district. These information are very useful to farmer to decide day to day basis agricultural activities. Social media like what's app group, twitter, face book and also via print media these information send to the farmer in advance for rainfall for next 5 days. farmers can decide on the basis of these useful information irrigation schedule and other necessary farm activities, like spraying of chemicals, intercultural operations ,harvesting etc. Indian meteorological department also develop an app called ***Damini*** which is useful for thunderstorm highly well in advance 30 to 40 min. So that human life can be saved. Another app ***Meghdoot*** also developed by the IMD, farmer can download it in their mobile for next coming 5 days weather condition. These are very useful apps to the farming community.

INSTITUTIONAL SUPPORT SYSTEM FOR FODDER ENTREPRENEURS IN THRISSUR DISTRICT OF KERALA STATE

Subin K.Mohan, Anand Raju, Baby Roshni, Anoop E.P, Mevin Sabu and Demian C. Johnson

College of Veterinary and Animal Sciences, Mannuthy, Thrissur, Kerala-680651
Email: subin.mohan@kvasu.ac.in

ABSTRACT

The respondents of the study were those farmers who cultivates and sell fodder for livelihood at the time of data collection. Thus, a total number of 60 respondents were selected for the final study. A schedule was developed for the purpose. The data collected were analysed using SPSS 21.0. Majority (55.70%) of the respondents received moderate support from family, relatives, input agencies and other institutes, followed by respondents who received low support and respondents who received high support. Among the nature of support from various institutions, majority (83.33%) received financial support from private money lenders followed in rank order by NABARD fund through various agencies, commercial banks, NGOs, state departments, friends, other farmers and relatives. Most (36.67%) received technological support from research institutes followed in rank order by state departments. Motivational support was received from relatives by most (45.00%) followed by friends and other farmers (36.67%). Most (43.33%) received inputs from research institutes followed by state departments. Majority (65.60%) of the respondents belonged to the category with a moderate level of contact (11.5-18.8) with various institutions followed by the category with a high level of contact (more than 18.8) with various institutions (18.00%) and low level of contact (less than 11.5) with various institutions (16.40%) respectively. Majority (65.60%) of the respondents belonged to the category which moderately preferred (6.1-11.2) institutions for loan/economic support followed by the category which less preferred institutions (23.00%, < 6.1) and a category with high preferred institutions (> 11.2) for loan/economic support (11.50%). Majority (62.30%) of respondents perceived the institutions which help fodder entrepreneurship as moderately useful (9.5 - 16.6), followed by respondents who perceived it as very useful (>16.6, 24.6%) and finally respondents who perceived it as less useful (<1.5, 13.1%). Among the organised agencies preferred by fodder entrepreneurs for credit facilities, cooperative societies ranked first with an average score of 34.80 followed in rank order by nationalized banks (19.00) and private banks (6.20). The results indicated that the institutional support of various agencies were moderate and the entrepreneurs expected a higher level of support.

ROLE OF KRISHI VIGYAN KENDRA FOR TRANSFER OF TECHONOLOGY UNDER FRONT LINE DEMONSTRATIONS IN TRIBAL AREA OF JALGAON DISTRICT

M.V.Mahajan1*, A.S Patil2 ,and D.S. Nehte3

Krishi Vigyan Kendra, Pal(Jalgaon-I), Maharashtra
Email: maheshmahajan2014@gmail.com

ABSTRACT

The Krishi Vigyan Kendras (KVK) is of national importance which would help in accelerating the agricultural production and also in improving the socio-economic conditions of the farming community. Krishi Vigyan Kendra, Pal under Central Platue Zone (assured rainfall). Need based training programmmes are being conducted by the KVK in various disciplines such as agronomy, horticulture, plant protection, women in agriculture, agricultural engineering and others. The Host Institute is working in remote tribal area since 1949 in the field of education, health, infrastructure development, agriculture and subsidiary occupation, cottage industries more particularly for tribal people. Survey method by personal interview was used for collecting the required information on component wise crop production technology transferred, extent of adoption of technology, Frontline demonstration, discipline wise training organized by KVK and farmers response towards training, costs and returns of crop production. The climate of the district is almost dry except in the monsoon. The average rainfall of the district is about 700 mm. The temperature ranges from 6^{o} to 10^{o} C in winter to 42^{o} to 47^{o} C in summer. The district lies between 20^{o} and 21^{o} C north latitude and 75^{o} 55' and 76^{o} 28' east longitude with total area of 11,765 sq km.Need based training programmmes are being conducted by the KVK in various disciplines such as agronomy, horticulture, plant protection, soil science, women in agriculture, agricultural engineering and others. The present study focused on how KVK is transferring the technology through training and demonstration and response of farmers in adoption of technologies with economic viability. It was concluded that KVK,Pal playing a vital role in disseminating the improved crop production technology and helps in increasing the crop yield. Further research need to be focused on the problems and constraint for adoption of the technology.

GROWTH AND PRODUCTIVITY OF SOYBEAN (*GLYCINE MAX* L.) UNDER DIFFERENT SOWING METHODS IN MALWA PLATEAU ZONE OF MADHYA PRADESH

R. P. S. Shaktawat

RVSKVV – Krishi Vigyan Kendra, 465441
Agar Malwa, Madhya Pradesh
E-mail: rpssbkn@yahoo.co.in

ABSTRACT

The On Farm Testing (OFT) was conducted at the farmer's field in adopted villages of Agar Malwa District in Madhya Pradesh during the kharif seasons of 2018, 2019 and 2020 to assess the effect of different sowing methods on the growth and yield of soybean (*Glycine max* L.). The sowing of soybean with a broad bed furrow (BBF) seed drill with 4 rows:1 dead furrow treatment gave 30.09 percent higher grain yield as compared to farmer's practice i.e. normal sowing (10.3 q/ha). Further, sowing of soybean with BBF seed drill in a 4 rows:1 dead furrow treatment gave significantly higher plant height (51.1 cm), number of pods per plant (41.0), seed per pod (3.44), net return and B:C ratio as compared to all other treatments tested and maintained the soil moisture for a longer period as compared to other treatments.

ASSESSMENT OF FLUBENDIAMIDE AGAINST *HELICOVERPA ARIGERA* OF CHICK PEA IN NEEMUCH DISTRICT OF MADHYA PRADESH

S.S. Sarangdevot, C. P. Pachauri, Deependra Singh Sarangdevot*, P. S. Naruka and J. P. Singh

Krishi Vigyan Kendra, Neemuch
* PG student, Department of Agronomy, RCA (MPUAT), Udaipur
Rajmata Vijyaraje Scindia Krishi Vishwavidyalaya, Gwalior (MP)

ABSTRACT

Chickpea is the most important pulse crop of India. Chickpea is one of the major Rabi crop in Malwa region, Neemuch is one of the major chickpea growing district of Madhya Pradesh. Farmers in the Neemcuh district are experiencing low chickpea yields of 50 to 60 percent due to gram pod borer infestation. The area of chick pea in Neemuch district of Madhya Pradesh affected by this pest is near about 80%. Therefore, an on-farm trial was designed and conducted in Rabi 2021–22 at a farmer's field. In these OFT, T1 was the spraying of Profenofos 50% EC @ 1 litre/ha (farmer's practice), T2 was Profenofos 50% EC @ 1 litre/ha followed by Flubendiamide 480% SC @ 150 ml/ha + installation of bird perches @ 20-30 /ha (recommended practice) and T3 was Flubendiamide 480% SC @ 150 ml/ha.

The experiment was laid out in 1.0 ha area at 5 farmer's fields under On Farm Trial (OFT). These five selected farmers were applying all three treatments. The recommended technology from IIPR 2018, i.e., spraying of Profenofos at 50% EC 1 litre/ha followed by Flubendiamide at 480% SC @ 150 ml/ha + installation of bird perches @ 20-30 /ha at 35 and 70 DAS respectively were compared with farmer's practices (T1), which were sprayed with conventional insecticide (Profenofos) with improper dose time and interval. The observation based on yield of chick pea revealed that the recommended technology (T2) is given higher yield and BC ratio i.e. 15.30 quintals/ha and 1:2.69 was achieved as compared to farmers practice (T1) and Flubendiamide 480% SC @ 150 ml/ha (T3) i.e. 12.41, 14.19 quintals/ha and 1:2.05, 1:2.45 respectively.

EFFICACY AND EVALUATION OF IPM MODULES AGAINST FALL ARMYWORM *SPODOPTERA FRUGIPERDA* (LEPIDOPTERA: NOCTUIDAE) IN MAIZE AT NEEMUCH DISTRICT (M.P)

S.S.Sarangdevot, Shilpi Verma, Deependra Singh Sarangdevot, P.S.Naruka, C.P.Pachauri and J.P.Singh

Krishi Vigyan Kendra, Neemuch

ABSTRACT

The appearance and rapid spread of the fall armyworm (Spodoptera frugiperda) (FAW) represents a significant threat to maize cultivation in India. Chemical control illustrates one of the foremost means of reducing the infestation of FAW in maize-growing zones. The emergence of this notorious, polyphagous pest presents a serious challenge to maize farmers and national food security in India. However, existing information regarding the field- efficacy of different insecticides against this pest isn't adequate and insecticide resistance for redacting sustainable management. The current study was framed to ascertain the most suitable insecticidal schedule against FAW for maize producers in Neemuch district (M.P). Within the year 2020–2021, three treatment schedules against FAW were evaluated, and therefore the efficacy was calculated in line with the percent plant damage (PD) by larvae. It absolutely was found that the very best cumulative efficacy (2.51% PD) was confirmed for T3 (constituted with cyantraniliprole, thiamithoxam, bird percher/ha, fugiperda pheromone trap, emamactin benzoate) with a significantly higher yield (48.77 q ha−1), whereas T2 (constituted with cyantraniliprole, thiamithoxam, bird percher/ha, fugiperda pheromone trap, Bacillus thurigensis) exhibited cumulative efficacy (4.45 % PD). The mean yield of IPM module T3 was 48.77 q/ha with net returns and C:B ratio of Rs. 53800/ha and 1:1.43, respectively. Whereas, farmer's practice recorded a mean yield of 43.3 q/ha with net returns and C:B ratio of Rs. 44471/ha and 1:1.21, respectively. Therefore, the module T3 might be recommended against FAW in the near future.

MANAGEMENT OF GIRDLE BEETLE (*OBEROPSIS BREVIS*) THROUGH NEWER MOLECULES OF INSECTICIDES IN SOYBEAN

S.S.Sarangdevot, Shilpi Verma, P.S.Naruka, C.P.Pachauri and J.P.Singh

Krishi Vigyan Kendra, Neemuch

ABSTRACT

Chemical control strategies remain the main tool in the suppression of soybean insect pest. In the past, defoliators were controlled using broad spectrum insecticides such as organochlorines, organophosphates, synthetic pyrethroids and carbamates. Overuse and reliance on these insecticides led to many documented cases of resistance of virtually all classes of insecticides. Today, insecticide applications are mainly limited to lepidopteran- specific compounds and newer chemistries of insecticides such as diamides. Presently, the insecticides recommended for the control of defoliators are methomyl (carbamate), indoxacarb (oxadiazine), spinosad (spinosyn) and flubendiamide (diamide). It is a known fact that these two lepidopteron defoliators showed certain levels of behavioral resistance to different classes of insecticides, hence successful control of this pest is to some extent difficult. Keeping this in view, study was under taken to test the effectiveness of some newer group of molecules against these pests in soybean. Field experiments were conducted during Kharif season of 2021-2022 to evaluate the efficacy of new molecules of insecticides i.e. Triazophos 40% EC, Thiacloprid 21.7% SC, Chlorantraniliprole 18.5% SC, and compared with untreated control plot against the Girdle Beetle, *Obereopsis brevis Swed.* Among them, Thiacloprid 21.7% SC @ 750ml/ha was found as the best treatment against Girdle beetle followed by Chlorantraniliprole @ 150ml./ha. The highest yield of 16.18 q/ha, was recorded in the plot treated with Thiacloprid 21.7% SC. The lowest yield of 13.20 q/ha was recorded in the untreated control. The C: B ratio of various insecticide treatments was calculated and the maximum C:B ratio (1:2.05) was recorded from Thiacloprid 21.7% SC treatment followed by Chlorantraniliprole 18.5% SC (1:81) and Triazophos 40% EC (1:1.55).

PROFITABILITY AND YIELD GAPS ANALYSIS STUDY OF BLACKGRAM (*VIGNO MUNGO* L.) IN AGAR MALWA DISTRICT OF MADHYA PRADESH

R. P. S. Shaktawat[1] and D. S. Tomar[2]

[1]RVSKVV– Krishi Vigyan Kendra, Agar Malwa – 465441 (Madhya Pradesh) India
[2]RVSKVV – Krishi Vigyan Kendra, Ujjain (Madhya Pradesh) India.
Email : rpssbkn@yahoo.co.in

ABSTRACT

The profitability, technological and extension yield gaps of blackgram crop were studied during *kharif* seasons of year 2018to 2021 under cluster front line demonstrations (CFLD Pulse) programme of pulse crop in Agar Malwa district of Madhya Pradesh. There was a wide yield gap between potential and demonstrations yields in the blackgram crop. The maximum technical yield gap of 580 kg/ha was found in the blackgram during kharif 2019. Further, a maximum extension yield gap of 290 kg/ha was found in blackgram during kharif 2021. The average additional cost and additional net return of Rs 1125 and Rs 13160 were recorded from 2018 to 2021. By adopting the improved production technology of blackgram, the average productivity can be increased up to 30.35% in blackgram.

IMPACT AND KNOWLEDGE ASSESSMENT OF ENTREPRENEURIAL TRAININGS UNDER ARYA PROJECT FOR BOOSTING UP THE NEW ENTREPRENEURS IN NEEMUCH (M.P)

P.S. Naruka, Shilpi Verma, S.S.Sarangdevot, C.P.Pachauri and J.P.Singh

Krishi Vigyan Kendra, Neemuch

ABSTRACT

Krishi Vigyan Kendra designs different kinds of training courses for the farmers/ farm women/rural youth. The location of the study was Krishi Vigyan Kendra, Neemuch because initially the Attracting and Retaining Youth in Agriculture (ARYA) project was implemented through KVKs in 25 states of the country. Under the ARYA project, Value addition in seed spice crops is the major aspect chosen for the present study. Total 100 respondents were taken for the study. The data was collected and analysed from trainees with the help of a well structured interview schedule cum questionnaire. With this context, the present study has been carried out to know the Knowledge of beneficiaries about recommended value addition in seed spice crops practices under ARYA project. The results of the study revealed that 47 farmers (47%) showed interest in establishing their own enterprise after acquiring the training. Results also showed that 72.00 percent of beneficiaries had a medium knowledge level followed by low level and high level of knowledge. Among recommended Value addition in seed spice crops practices, farmers had more knowledge in grading and sorting practices with first rank with MPS 72.22 by beneficiary followed by grinding practices (MPS 64.44 by beneficiaries) and newer product development and machines practices (MPS 62.00 by beneficiaries). Entrepreneurial trainings like these played an important role in developing the skills among the rural youths and also benefiting them for income generation. Skill training programmes are very useful to the rural youth to earn their livelihood through subsidiary occupations and improve agriculture income with the development supplementation of this income.

PRODUCTIVITY AND PROFITABILITY ANALYSIS OF LATE SOWN WHEAT (CV. RAJ. 4238) UNDER PADDY-WHEAT CROPPING SYSTEM AT FARMERS' FIELDS

R.K. Bairwa*, Roop Singh, Kamla Mahajani[1], Gunjan Sandhya and Sarita

Krishi Vigyan Kendra, Kota-324001 (Raj.)
[1]Krishi Vigyan Kendra, Bundi-323001 (Raj.)
* Email: rb_agro@rediffmail.com

ABSTRACT

The study was carried out during Rabi 2015-16 to 2019-20 at farmer's fields in the adopted villages of Bundi district of Rajasthan. Frontline demonstrations were conducted in an area of 75.2 ha with active participation of 188 farmers with the objective to analyse the productivity and profitability of late sown wheat under the paddy-wheat cropping system. The results revealed that frontline demonstrations recorded higher grain yield of wheat as compared to farmer's practices over the years of study. Improved variety (Raj 4238) of wheat resulted in progressively increased grain yield from 43.44 to 51.46 q/ha with a range of 6.41 to 12.97 per cent higher over farmers practices during five years of study. In addition to the increase in grain yield of wheat, the means of extension gap, technology gap and technology index were found to be 3.94, 5.92 q/ha and 10.76 per cent, respectively. The extension gap may be reduced by popularization of improved packages and practices of wheat in late-sown condition under paddy-wheat cropping system. Improved variety (Raj 4238) of wheat under late sown condition also gave a higher gross and net return with more benefit cost ratio as compared to farmer's practices over the years of study and on a mean basis. The study was also revealed that variety Raj 4238 was found feasible in late sown conditions under paddy-wheat cropping system in Bundi district of Rajasthan.

FIELD EFFICACY OF *TRICHODERMA VIRIDE* AGAINST *FUSARIUM* WILT OF CHICKPEA IN KARAULI DISTRICT OF RAJASTHAN

Roop Singh*, Rakesh Kumar Bairwa, Irfan Khan[1], Kamla Mahajani[2] and Sarita

Krishi Vigyan Kendra, Kota (Rajasthan) 324001
[1]Krishi Vigyan Kendra, Chomu, Jaipur (Rajasthan) 303702
[2]Krishi Vigyan Kendra, Bundi (Rajasthan) 323001
*Email: roop0008@gmail.com

ABSTRACT

Chickpea (*Cicer arietinum* L.) is an important pulse crop in India. Wilt disease is the major limiting factor in chickpea production, incited by *Fusarium oxysporum* f.sp. *ciceri, it* is widespread in chickpea growing areas, resulting considerable economic losses. A non-farm trial was conducted at farmer's field to diminish *Fusarium* wilt of chickpea. The assessed practice of seed treatment with *Trichoderma viride at* 5 g/kg seed plus incorporation of *T. viride* at 5 kg/ha multiplied on decomposed FYM at 100 kg/ha at the time of sowing recorded minimum disease incidence 7.85 percent with maximum efficacy in disease control (76.13) as compared to farmers practices. There was 37.41 per cent more yield in assessed practices plots than farmer's practices and the highest net return and benefit cost ratio was also obtained.

A CROSS-SECTIONAL SURVEY ON IMPACT OF LOCKDOWN DUE TO COVID-19 ON LIFESTYLE AND DIET PATTERN OF PEOPLE IN INDIA

Shilpi Verma, P.S.Naruka, S.S.Sarangdevot, C.P.Pachauri and J.P.Singh

Krishi Vigyan Kendra, Neemuch

ABSTRACT

The COVID-19 pandemic has already affected the human lifestyle, including our consumption patterns, especially during the lockdown period. Although several factors have contributed to the changes in our dietary pattern during the COVID-19 lockdown period, the main reason can be attributed to the restrictions imposed on the movement of people during the lockdown. The population of India mainly felt the ultimate repercussions on the consumption patterns. Dramatic changes in the price of food items also affected the demand for such commodities during the lockdown period. This study aims to analyze the impact of COVID-19 and the lockdown on the dietary patterns of Indian consumers by performing a countrywide survey using a self-administered electronic questionnaire.

The cross-sectional study was conducted using a validated, self administered electronic questionnaire distributed through emails and online social networking platforms from August 2020 to September 2020. The participants of the study were informed about the objective of the study. The questionnaire consisted of 19 questions and the survey form was prepared using the Google Forms application and circulated through various electronic means. The study collected data from consumers all over the country, represented by all states and union territories.

A total of 375 individuals belonging to different states and union territories participated in the study. COVID-19 outbreak in India has altered the consumption patterns of the 70% of people who participated in the current survey. The primary reason behind the change was the non-availability of products transported from other geographical areas through various transportation methods. It is observed that 41.0% to 66.8% of the young adults changed their dietary intake patterns during the pandemic. Increased consumption in cereals and grains (88.5%), as well as oils and fats (90.6%), was positively associated with weight gain during the pandemic. On the contrary, an increased intake of plain warm water (51.9) was observed during the lockdown. Findings in the current study also showed that 65.5% started practising Yogasana, Pranayama, meditation and consumed herbal tea / decoction (Kadha) distributed by Ministry of AYUSH intentionally because of COVID-19 or prepared at home and consumed as directed as advised by the Ministry of AYUSH. 92 percent of respondents reported reducing food waste during the COVID-19 pandemic. Hence it can be concluded that the sudden imposition of lockdown and the subsequent shutdown during the initial phase affected consumers. It made people aware of and concerned about their health. People also followed all the guidelines laid out by the government

IMPACT OF KVK TRAINING PROGRAMME ON SOCIO–ECONOMIC STATUS AND KNOWLEDGE OF TRAINEES IN SIWAN DISTRICT

Anuradha Ranjan Kumari1, Sarita Kumari2, Nandeesa, C.V3 and Jonah Dakho4

Krishi Vigyan Kendra (DRRPCAU) Bhagwanpur Hat, Siwan, Bihar
(E-mail- anuradha_rau@rediffmail.com)
Senior Scientist & Head[1] ,SMS, Home Science[2,]SMS, Plant Protection[3,] SMS, Horticulture[4]

ABSTRACT

The present study was undertaken among 120 respondents consisting 60 on campus trainees and 60 off campus trainees spread among five selected villages under Bhagwanpur block of Siwan district. Variables namely respondent's socio-economic status and their levels of knowledge about training programme of the selected KVK were measured by utilizing pre structured schedule. Study reveqaled that the majority of on campus trainees (56.60 %) had medium socio-economic status followed by low Socio-economic status (28.30 %) and only 15.10 per cent had higher level of socio-economic status where as in case of off campus trainees 51.90 per cent had low socio economic status followed by 36.70 per cent medium level and only 11.40 per cent had high level of socio-economic status. The study revealed considerable difference between on and off campus trainees regarding their socio-economic status. Majority of the on campus trainees had high level of knowledge followed by medium level of knowledge and low level of knowledge whereas in case of off campus trainees 55.24 per cent respondents had medium level of knowledge followed by 26.70 per cent had low level of knowledge. This indicates that there has been a significant difference between on and off campus trainees in respect to their knowledge KVK training programme.

KNOWLEDGE OF IMPROVED PRODUCTION TECHNOLOGIES OF PULSES BY THE FARMERS IN SIWAN DISTRICT

Anuradha Ranjan Kumari1, Harsha, B.R.2, Nandeesa, C.V3 and Jonah Dakho4

(E-mail- anuradha_rau@rediffmail.com)
Krishi Vigyan Kendra (DRRPCAU) Bhagwanpur Hat, Siwan, Bihar
Senior Scientist & Head[1] ,SMS, Home Science[2,]SMS, Plant Protection[3,] SMS, Horticulture[4]

ABSTRACT

The present study was conducted in 15 villages from three purposely selected blocks of the district because activities of CFLD programme were going on in these blocks viz. Bhagwanpur, Duraundha and Zeeradei. Five villages from list of adopted village of KVK, Siwan from each selected block and 10 farmers from each selected village were drawn randomly. Thus, the sample consisted of 150 respondents for the study. Three major crops viz. Lentil, Chick pea and Field pea were included in the study. Various suitable statistical tests were used in the data analysis. It could be concluded that majority of the farmers were in medium knowledge group followed by high and low group respectively in all the selected crops, Majority of the farmers have substantial amount of knowledge about the harvesting and storage, irrigation management and application of rhizobium culture. While farmers had poor knowledge about plant protection measures, seed treatment and soil treatment in all selected crops. It was further added that farmers had also good knowledge about high yielding varieties with regard to all selected crops except field pea cultivation. Farmers had average knowledge about fertilizer application in all crops. Poor knowledge about plant protection measures, soil treatment and seed treatment in selected crops may be attributed to low literacy level and little participation in extension programme, poor contact with extension agencies, poor contact with progressive farmers in the village etc.

EFFECT OF FOLIAR SPRAY OF UREA AND MICRO-NUTRIENTS ON GROWTH, YIELD AND QUALITY OF ACID LIME (*Citrus aurantifolia* Swingle) cv. KAGZI LIME UNDER MALWA PLATEAU CONDITIONS

A. Yadav, Jyoti Kanwar, J. Bhandari and M. Upadhyay

KNK College of Horticulture, Mandsaur, Madhya Pradesh, India
Email:bhandarijitendra01@gmail.com

ABSTRACT

Field experiments were conducted during 2016-2017 at K.N.K. College of Horticulture, Mandsaur, Madhya Pradesh to find out the to study the effect of urea and micro-nutrients on growth, yield and quality of acid lime (*Citrus aurantifolia* Swingle) cv. Kagzi lime under Malwa Plateau conditions. The result revealed that the foliar spray of urea 1.5% + borax 0.6% + ZnSO4 0.5% (T_{12}) was found to be the best for maximum increase in plant-height (0.32 m), plant spread in north-south (0.37 m), plant spread in east-west (0.33 m), leaf area (39.97 cm^2) number of flowers per plant (1977.33), fruit set (63.28%), reduced fruit drop (36.14%),fruit retention (63.86%), fruit length (4.93 cm), fruit diameter (4.79 cm), fruit weight (52.50 g), fruit volume (51.67 ml), juice percent (60%), TSS (8.20 ^{0}Brix), reduced fruit acidity (6.40%), TSS/Acid ratio (1.29), ascorbic acid (31.21 mg/100 ml juice), zinc content in leaves (12.23 ppm), boron content in leaves (39.17 ppm) and maximum number of fruits per plant (985) which ultimately increased the yield of fruits per plant (45.40 kg) compared to other treatments. Whereas specific gravity (g/ml) and peel thickness (mm) of fruits was observed non significant effect over control. Maximum benefit: cost ratio (4.35:1) was found with application of treatment T_9 (ZnSO4 0.5%) which was economically viable as compare to other treatments.

EFFECT OF PRUNING INTENSITY AND SPRAY OF PGR'S ON GROWTH, YIELD AND QUALITY OF GUAVA (*Psidium guajava* L.) cv. SARDAR

Basavraj Magadum, R. N. Kanpure, J. Bhandari and M. Upadhyay

R.V.S.K.V.V., College of Horticulture, Mandsaur (M.P.)
Email:bhandarijitendra01@gmail.com

ABSTRACT

A study was conducted to see the effect of pruning intensity and spray of PGR's on growth, yield and quality of guava (*Psidium guajava* L.) cv. Sardar, at the Department of Fruit Science, RVSKVV, College of Horticulture, Mandsaur, Madhya Pradesh, during the year 2016-2017. The experiment was laid out in Factorial Randomized Block Design consisted of three replications, sixteen treatments with one plant in each treatment. The different pruning intensity, P_3 (30 cm pruning) was recorded the maximum number of new emerged shoots per meter branch (8.22), length of new emerged shoots (35.97 cm), minimum number of days taken to flower initiation (39.47), number of flowers plant^{-1} (1134.70), fruit setting (72.23%), fruit drop (30.83%), fruit retention (68.28%), fruit volume (179.31 ml), fruit length (6.52 cm), fruit diameter (7.01 cm), pulp thickness (1.44 cm), pulp weight (127.91 g), minimum acidity (0.34%), TSS (11.46 **°Brix),** total sugars (6.68%), ascorbic acid (178.66 mg/100 gm), number of fruits harvested plant^{-1} (479.58), fruit weight (163.06 g), fruit yield plant^{-1} (78.20 kg) and fruit yield ha^{-1} (217.22 q) of guava. With respect to effect of PGR's, application of G_2 (600 ppm NAA) was recorded the increased number of new emerged shoots per meter branch (9.39), length of new emerged shoots (37.72 cm), number of flowers plant^{-1} (1179.70), fruit setting (77.24 %), fruit drop (27.99 %), fruit retention (70.13 %), fruit volume (191.63 ml), fruit length (6.86 cm), fruit diameter (7.51 cm), pulp thickness (1.50 cm), pulp weight (139.55 g), ascorbic acid (187.62 mg / 100 g pulp), chlorophyll content (39.29 SPAD value), number of fruits harvested plant^{-1} (521.92), fruit weight (170.33 g), fruit yield plant^{-1} (88.90 kg) and fruit yield ha^{-1} (246.94 q) of guava. Whereas, minimum number of days taken to flower initiation (39.47), acidity (0.33 %), TSS (12.11 ^{o}Brix) and total sugars (6.79 %) were recorded in G_3 (600 ppm Ethephon). The interaction studied showed that P_3G_2 (30 cm pruning + 600 ppm NAA) had recorded the highest value with growth, yield and quality, while the combination of P_3G_3 (30 cm pruning + 600 ppm Ethephon) was good for qualitative parameters as compared to the control P_0G_0 (Unpruned with water spray).

EFFECT OF PROPAGATION MEDIA AND BIOFERTILIZERS ON SEEDLING GERMINATION AND SEEDLING VIGOUR IN AONLA (*EMBLICA OFFICINALIS* GAERTN.)

Dipmala Vyas, P. Sonkar, P. K. Ausari, J. Bhandari and M. Upadhyay

R.V.S.K.V.V., College of Horticulture, Mandsaur, Madhya Pradesh-458001
Email:bhandarijitendra01@gmail.com

ABSTRACT

The experiment entitled "Effect of propagation media and biofertilizers on seedling germination and seedling vigour in Aonla (Emblica officinalis Gaertn.)" was carried out at Research Field, Department of Fruit Science, K.N.K. College of Horticulture, Mandsaur, Madhya Pradesh, during the year 2020-21. The experiment consisted 18 treatments. The experiment was carried out in completely randomized design and repeated thrice. The effect of different treatments on seed germination, seedling growth and survival percentage were recorded. The results of experiment showed that Aonla seeds sowing with treatment GM18 (Soil + Neem cake + Vermicompost + FYM + Rhizobium + Trichoderma spp. @ 2.5 g) gave the minimum days taken to seed germination (10.00), maximum number of seedling sprouted (13.32), germination percentage (94.54 %), survival percent (81.03 %), seedling height (4.20 cm), number of leaves per plant (4.51), leaf area (17.80 cm2), fresh weight of shoot (93.06 g), dry weight of shoot (81.03 g), length of roots (7.21 cm), diameter of roots (1.05 mm), fresh weight of roots (4.34 g), dry weight of roots (2.21 g), speed of germination (7.56), mean daily germination (3.53), peak value (1.33) and germination value (4.68).