



# Quality Pulse Seed Production Through Seed Hub

Kiran Mary Kandir, Jayant Kumar Lal and Arti Beena Ekka<sup>1</sup>

Krishi Vigyan Kendra, Dumka,  
Birsra Agricultural University, Ranchi, Dumka 814 101 (Jharkhand)

## ABSTRACT

The objective of this programme was to increase indigenous production of pulses and make available quality improved/ high yielding / climate resilient varieties to farmers, government, non- government organizations in time as per indent or demand placed and to achieve self sufficiency in respect of seeds at village level itself. The seeds are sold at the price fixed by KVK with 10 to 20 per cent more either on market price. Farmers of selected village for seed hub are working under the technical support and guidance of KVK scientists. They were trained technically and made more sound by adopting good agronomic practices to fulfill the objective. About 150 farmers from 16 villages of Ramgarh block participated actively in this participatory seed production programme. Improved varieties of six types of pulses were cultivated and seeds produced. Under this programme pigeon pea production area in Dumka occupied 90 ha in *kharif* which was maximum followed by chick pea with 61 ha in *rabi* and overall 223 ha area was covered to produce 2051 q of pulse seeds since *kharif* 2016 to *rabi* 2020, Zonal research stations, government departments, NGOs and other KVK lifted seeds as per their indent.

**Key Words:** Dumka, Pulse, Quality, Seed, Seed Hub, Village.

## INTRODUCTION

India is the largest producer, consumer and importer of pulses in the world. Pulses are important for the nutritional security of the cereal based vegetarian diet of large population of India. The daily requirement of pulses is 80g (Christopher, 2016) and availability is 48g only (Anonymous, 2020). Due to ever increasing population, rising income of people and pulses being the major source of protein in Indian diet, the demand for pulses continues to grow at 2.8 per cent per annum. It is estimated that 27.5 Mt of pulses would be required by 2025 (Chauhan *et al*, 2016). Since more than 80 per cent of the area under pulses is cultivated under stressed rainfed condition in Jharkhand, the quality seed of improved varieties has been emerged as the most vital input for enhancing pulse production. For ensuring availability of quality seed, it was estimated that 39.38 lakh q and 46.87 lakh q quality

seed of improved varieties would be required in 2020 and 2025, respectively, at increased seed replacement rate (Chauhan *et al*, 2016). He also showed increasing SRR of all the pulses under study during the last decade.

The seed Hub related to quality seed production of pulses came in existence in financial year 2016 and noticed that at national level in the year 2014-15 pulse seeds availability was 32.9 lakh q whereas requirement was only 28.08 lakh q. It was evident that the supply was sufficient but lacking the quality seeds that is required to improve the yield per unit to fulfill the nutritional security in our country. There is need of about 25-30 lakh quintals of quality seed every year to achieve 33% seed replacement rate of OP varieties to enhance production and productivity of pulse crops. Large area with suitable topography for pulse production in Jharkhand is definitely the

<sup>\*</sup>Corresponding Author's Email: [kandirkm@rediffmail.com](mailto:kandirkm@rediffmail.com)

<sup>1&2</sup> Krishi Vigyan Kendra Dumka, Birsa Agril. University Ranchi:

<sup>3</sup> Krishi Vigyan Kendra E. Singhbhum Birsa Agril. University Ranchi

opportunity to produce the targeted quantity and to attain the nutritional as well as food security.

Participatory seed production was the need of time as the private sector has always preference for high value low volume crops and they contribute 58.8 per cent to total seed availability. Pulses are high volume low value crops and thus, private sectors were and still least interested in pulse seed production. So, it was the responsibility of public sector organizations and governments to encourage and make programmes like participatory seed production at grass root level. Through Seed Hub it was an attempt to involve small farmers to contribute their land and effort in quality seed production of pulses. Farmers usually recycle the farm seed due to unaffordable cost price of seeds. As the seed requirement per unit area is high alongwith high cost incurred in transportation seems non remunerative leading to reuse the old unproductive and unidentified local seed varieties (Singh and Singh, 2016).

Amongst 98 KVKs in India who have been allotted Seed Hub, KVK, Dumka in July 2016 started cultivation for seed production of pigeon pea var.NDA-2 and black gram var. Uttra. During the years of seed production from 2016-17 to 2019-20 varieties like NDA 2, MANAK, IPA 203 of pigeon pea; var. PU-31, Uttra and WBU 109 of black gram ; var. HUM 16, IPM 2-14, IPM 2-3 of green gram; variety Birsa Kulthi 1 of horse gram; variety; GNG 1581 of chick pea and variety IPL 316 of lentil were procured and produced quality seeds.

Seed replacement rate (SRR) is defined as the percentage of area sown with certified/quality seeds out of the total cultivated area under a crop in a season (Singh and Chand, 2011). There are several reasons for poor seed replacement in field crops in Jharkhand which include high cost of seed, large storage losses, inefficient conversion of breeder seed to certified seed and very less participation of the private seed sector.

**Table1. Showing requirement of desired quantity of Pulse seed in Jharkhand and national level.**

Crop	Requirement of seed in Jharkhand by 2020-21(q)			Requirement of seed in India by 2020-21(q)			Seed rate Kg/ha	SMR	SRR	Yield q/ha
	BS	FS	CS	BS	FS	CS		India (Jhar.) Per cent	India (Jhar.) Per cent	
Black gram	30.9	617	37400	260	790	237000	20	40(20)	35(33)	5
Chick pea	744	7445	225600	11400	170800	2562000	80	15(10)	35(33)	10
Green Gram	8.3	165	10000	300	900	270000	20	30(20)	35(33)	5
Horse gram	3.8	114	10325	-	-	-	20	- (30)	-	5
Lentil	9	256	23250	1070	16100	241500	50	15(30)	35(33)	6
Pigeon pea	8.4	421	63720	230	920	368000	20	30(50)	45(33)	10

*Source: Seed Roll Plan of Jharkhand state 2017-18; 2021-22 & Enhancing pulse production in India through improving seed and variety replacement rates.*

## Quality Pulse Seed Production

**Table 2. Showing Seed Replacement Rate and seed required by seed producers in Jharkhand.**

Year Crop	SRR of Jharkhand (%)			SMR (%) of Jharkhand		Quality Seed Req. in Jharkhand
	2014-15	2015-16	2020-21	2014-15	2017-21	2020-21
Black gram	10.01	20.00	33	20	20	647.9
Chick pea	2.48	3.17	33	10	10	82637
Green gram	0.0	25.00	33	20	20	173.3
Horse gram	0.0	80.00	33	30	30	117.8
Lentil	2.77	34.29	33	30	30	7937
Pigeon pea	6.7	25.00	33	15	50	429.4

*Source: Seed Rolling plan 2017-18 to 2021-22. Deptt. of Agriculture & Cane Development, Jharkhand 2015-16 (seednet.gov.in).*

By the use of quality seeds alone productivity could be increased by 20-25 per cent and if quality seed is used along with good agronomic practices (GAPs) the yield could be increased by 45-50 per cent. (Singh and Singh, 2016). The seed requirement of different pulse crops grown is estimated through an effective seed roll plan which in turn can be calculated by having knowledge of (i) area under the respective crop (ii) seed rate/hectare and (iii) seed multiplication rate (SMR).

### MATERIALS AND METHODS

Production of quality pulse seeds under seed hub was started in Ramgarh block of Dumka by Krishi Vigyan Kendra Dumka in 2016-17. Selection of villages in Dumka district was decided on the basis of availability of irrigation facility, comparatively favourable micro climatic situation with respect to yield potential of indigenous pulse crop, laborious and accountable farmers group to carry out the responsibility of 'Seed Production in a Participatory mode' (Roy, 2014; Ramakrishna et al, 2020). Six pulse crops *i.e.*, pigeon pea, black gram, green gram, horse gram, lentil and chick pea were cultivated for seed production in 16 villages were selected and 150 small and marginal farmers were involved in seed production. Participatory pulse seed production was carried out in villages Tilanda, Mahauria, Jagatpur, Jirolia, Jiapani, Sadudih, Kurumtanr, Basuduma and Patharia.

Farmers of selected village were trained for good agronomic practices and also for soil sampling for soil test, soil amendment techniques, identification of quality seeds, types of seed produced, certification, registration, field preparation, seed rate, seed treatment, spacing, manures and fertilizers through INM and method of application, insect pest management, time of inspection, roguing, irrigation, harvesting, threshing and safe storage. Time to time field visit and advisory when needed were provided by the scientists of KVK Dumka. All the required activities in the field were done by the farmers in participatory mode up to storage and KVK Dumka played a vital role in processing, grading and marketing of seeds.

Pulse varieties preferably not older than 10 years were procured by KVK Dumka for seed production. Universities and institutions like NDUAT, BAU, Ranchi and IIPR Kanpur for pigeon pea, BAU Sabour for green gram and black gram, National Seeds Corporation Limited and Rajasthan Krishi Vishwavidhyalaya, Bikaner for Chick pea, BAU, Ranchi for Horse gram, green gram, BCKV West Bengal for black gram and KVK, Dumka also supplied foundation seeds produced at its own farm. Funding for Seed certification and registration are done by KVK Dumka. The produced seeds were certified by the Jharkhand state Seed Certification Agency as per the specification

**Table 3. Showing details of crop and varieties under seed production in Jiapani Seed Village**

Year	Season	Crop	Variety
2016-17	Kharif	Pigeon pea	NDA 2 BS
		Black gram	Uttara FS
		Green gram	HUM 16
2017-18	Rabi	Chickpea	Pusa 372 FS
	Kharif	Black gram	PU 31
		Green gram	HUM 16
Pigeon pea		NDA 2	
2018-19	Kharif	Pigeon pea	MANAK
		Chick pea	GNG 1581
		Green gram	IPM 2- 14
	Rabi	Black gram	WBU 109
		Green gram	HUM 16
		Green Gram	IPM 2-14
2019-20	Kharif	Green gram	IPM 2-3
		Pigeon pea	IPA 203
		Pigeon pea	NDA 2
		Horse gram	Birsa Kulthi 1
		Chick pea	GNG 1581
		Lentil	IPL 316
	Rabi	Black gram	WBU 109
		Green gram	IPM 2-14
		Pigeon pea	IPM 203
2021-22	Kharif	Do	Rajiv Lochan
		Do	Birsa Arhar 1
		Chick pea	GNG 1581
2022-23	Rabi	Lentil	IPL 316

of the Indian Minimum Seed Certification Standard,1971(Anonymous <http://seedtamilnadu.com/imscs.htm>) and revised Indian Minimum Seed Certification Standard, 1988 (Tunwar and Singh, 1988).

### Post Harvest and Marketing

Post harvest activities like processing, packaging, tagging and marketing to government and non govt. organization was done by KVK, Dumka.

## RESULT AND DISCUSSION

Introduction of high yielding varieties of pulses for sustainable production is required to meet the demand (Chauhan *et al* ,2016).

The data (Table 4) showed the quality seed production with high yielding pulse varieties. According to Jharkhand State Seed Rolling Plan 2017-18 to 2021-22 New varieties were needed with higher level of yield and stability to replace the older ones, Out of total 2051q, 826.811 quintals of seed procured and supplied to the govt. and non

### Quality Pulse Seed Production

**Table 4. Showing the outcome of Seed Hub from 2016-17 to 2019-20 by KVK Dumka.**

Year	Season	Crop	Variety	Area (ha)	Production (q)	Quantity.(q) Procured
2016-17	Kharif	Pigeon pea	NDA	10	20	10
		Black gram	Uttra	5	2.0	1.1
2017-18	Kharif	Black gram	PU 31	10	35	18.79
		Green gram	HUM 16	10	60	28.85
		Pigeon pea	NDA 2	17	80	33.185
		Pigeon pea	MANAK	25	10	0.365
		Chick pea	Pusa 372	4	600	302.587
	GNG 1581	50				
2018-19	Kharif	Black gram	WBU 109	4	5	2.0
		Green gram	HUM 16	10	6	1.2
		Green Gram	IPM 2-14	7.5	15	5.86
		Green gram	IPM 2-3	7.5	18	7.884
		Pigeon pea	IPA 203	4	65	50
		Pigeon pea	NDA 2	6	85	70
		Horse gram	Birsa Kulthi 1	5	20	5.24
		Chick pea	GNG 1581	10	200	142.05
		Lentil	IPL 316	10	50	19.97
		2019-20	Kharif	Pigeon pea	IPA 203	5
Do	Rajiv Lochan			5	200	10
Do	Birsa Arhar 1			8	250	15
Chick pea	GNG 1581			7	90	41.63
Lentil	IPL 316			7	40	11.1

govt. organizations. ICAR given target of 650q to KVK Dumka for the year 2016-17, 900 q for 2017-18 and 1000q for the financial year 2018-19. With respect to the target received we remained lagged behind as the production was only 22q in year 2016-17. In year 2017-18 quantity of seed produced was 785 q which is 87.2 per cent of target and in 2018-19 only 464 q of total pulse seeds were produced. This gap in the target and production may be due to incorporation of green gram which is not in their practice that requires picking 3-4 times as its maturity is not synchronous and decreasing the area of pigeon pea which is the most suitable with respect to agro-climatic condition required for it. In the second year (2017-18) of seed production

pigeon pea was sown under seed hub in 42 ha area but it was reduced to 10 ha in 2018-19 at the same time in rabi season also the area decreased for chick pea from 54 ha in 2017-18 to 10 ha in 2018-19. So, the impact of this reduction in area for these pulse crops affected the target and remained behind by 27.5 per cent at the end of third year in total quality seed production of pulses. So, the selection of crop is important and it must be based on the soil, climate, topography of the region and farmers normal working practice and choice. There is a strong co-relationship between the quality of seeds, the seed replacement rate and the yields. One of the major reasons for low yields was disappointingly low rate of seed replacement rate and with quality

pulse seed production it has been increased with respect to seed production and SRR since 2016 onwards (Anonymous, 2018).

A big gap has been found in production and its procurement as the lifting is based on the demand by different organizations. Rest quantities of seeds were purchased locally by farmers and some kept for the production in the next year. This was evident that farmers have initiated the pulse seed production enterprise through which they were connected to various private and govt. organizations in the network of seed production and supply. It is expected that the big gaps of production and lifting for supply may be reduced by placing the availability of seeds in the network of seed demand and supply chain and appropriate indent of varieties available must be ensured. Sometimes organizations don't lift the seeds even after placing its indent and the processed and packaged seeds remain in the KVK after spending lots of money in lifting, transportation, processing and packaging. This is a big threat for the institutions who has to be accountable for funds received and maintaining revolving accounts. This incidence affects production and supplying group who loses work potential and enthusiasm in this enterprise.

### CONCLUSION

To meet the supply of quality pulse seed, KVK's are playing a vital role through seed hub. Hence, in this direction KVK, Dumka has made an attempt to produce quality seed of pulses like pigeon pea, black gram, green gram, horse gram, chick pea and lentil. In its four years of production since kharif 2016-17 to rabi 2019-20 a production of 910 q of pigeonpea, 42 q of black gram, 99 q of green gram, 20 q of horse gram, 890 q chickpea and 90 q of lentil seeds were produced from Jiapaani seed hub. Out of 2051 q of seeds produced 826.811q were lifted by government and non- government organizations and Jiapaani seed hub got recognition as an entrepreneur. Now the high yielding quality seeds of pulses are in the cultivation practices at

remote areas of Dumka increasing the production and productivity of pulses that were not taken care before. Inspite, there is a need for convergence of various schemes on seed as well as stakeholders to synergize the efforts for better output and outcome. Increased percentage of varietal and seed replacement rates, proper planning and execution by including new climate resilient varieties in the seed chain can lead to the significant increase in productivity of pulses in Jharkhand.

### REFERENCES

- Anonymous (2020). Daily Availability of pulse per capita in India 2011-2019. Published by Statistical Department Oct. 16, 2020.
- Chaturvedi S K, Katiyar P K, Lamichaney A and Singh N P (2016). Seed: A vital component for enhancing pulse productivity. *Technical Bulletin* ICAR-IIPR Kanpur13/2016.
- Chauhan J S, Singh B B and Gupta S (2016). Enhancing pulse production in India through seed and variety replacement rates. *Indian J Gen Pl Breed* 76 (4) 410
- Christopher P F Marinangeli (2016). A recommended consumption level for pulses: Developing a Pulse Brand and Pledge. SAHMRI Institute, Adelaide.
- Ramakrishna, Rajashekhar, Reddy P, Rajaskhar B, Shankar A, Jahan A, Reddy J M and Kumar A (2020). Quality Seed Production of Pulses through Pulse Seed Hub Project At KVK Palem Nagarkurnool, Dist. Telangana. [researchgate.net/publication/344471918](https://researchgate.net/publication/344471918).
- Roy B (2014). Farmers' participatory quality seed production of field crops-A case study Dept. of Genetics and Plant Breeding, Regional Research Station, Uttar Banga Krishi Viswavidyalaya, Pundibari-736 165, Cooch Behar, West Bengal. *J Crop and Weed* 10(2):89-93.
- Singh H and Chand R (2011). The Seeds Bill, 2011: Some reflections. *Economic and Political Weekly*, XLVI (51), 22-25.
- Singh R P and Singh S (2016). Optimising Seed replacement Rates in Jharkhand Present Scenario, Challenges and Opportunities. *Jharkhand J Dev and Manage Stud* XISS, Ranchi, 14 (2) : 6987-7007.
- Tunwar N S and Singh S V(1988). *Indian Minimum Seed Certification Standards*. The Central Seed Certification Board. Department of Agriculture, Government of India, New Delhi.

Received on 16/2/2021

Accepted on 15/04/2021