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Knowledge Levels of Rural Youth about Plant Propagation Techniques of Horticultural Crops

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ABSTRACT

The study was conducted in Banka district of Bihar during 2016 to study the extent of knowledge gain of rural youth about propagation of horticultural crops. The sample size of 47 respondents before and after training constituted. The findings revealed that most of the respondents had complete knowledge about scientific method of nursery raising, high towards knowledge of plant per sq m area, maintenance of net house, marketing of grafted plants, use of balance dose of fertilizers, method of plant propagation, use of weedicide and moderate knowledge about plant propagation. The major contributing factors for knowledge gaps were selection of scion and root stock, scientific methods of nursery raising, disease management and their control, plant per sq m area. Significant difference obtained in between respondent before and after training.

Key Words: Horticulture, Knowledge, Knowledge gap, Propagation, Techniques, Youth.

INTRODUCTION

India would be at rank first in young youth population up to year 2030 over worldwide. Over the past few years, rural youth have been shying away from agriculture and globally there is an increasing interest in findings ways of engaging youth in agriculture (Paisley, 2013). Horticulture occupied nearly 11 per cent land of the total cultivated area in Bihar. Various horticultural crops *viz.* mango, litchi, banana, guava, jackfruit and zizupus etc. are grown extensively. The scientists of KrishiVigyan Kendras help rural youth by imparting vocational training programmes which help in generating higher income through nurseries. Considering the above facts in view rural youth of different pockets were trained and skilled for propagation of various types of fruit and flower plants. Rural youth is lacking in adequate knowledge therefore, there is a need to recognize their problems and provide a probable solution to achieve their goals. Likewise, knowledge of plant propagation techniques of horticultural plants was limited among rural youth. Therefore, the study was under taken to find out the extent of knowledge of trained and untrained rural youth about techniques of plant propagation, knowledge gap and assess the impact of trainings.

MATERIALS AND METHODS

The study was conducted in Banka districts of Bihar during 2016-17, with the sample size of 47 respondents. The trainees selected from the each block of district Banka on the basis of pre analysis of their livelihood needs. Educated, progressive and unemployed rural youth selected from the eight blocks of Banka for this study. To measure the knowledge level of rural youth , a knowledge index was prepared taking 17 practices namely importance of plant propagation, knowledge about plant propagation, selection of scion and root stock, use of balance dose of fertilizers, use of weedicide, disease management and their control, insect pest management and their control, knowledge of maintenance of nursery, scientific methods of nursery raising, selection of cultivar, seed treatment,

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plant per square meter area, time of propagation, propagation of plant in net house, maintenance of net house, knowledge about protected cultivation and marketing of grafted plants. These practices were identified through review of literature and discussion with experts, gardeners, nursery growers. In this training programme selected respondents were enrolled and imparted training whereas major emphasis was given on theory as well as on skill development. The following device was developed to measures the knowledge level of respondents regarding selected technologies of plant propagation.

$$KI = \frac{\text{Obtained knowledge score}}{\text{Obtainable knowledge score}} \times 100$$

where KI= Knowledge Index of a respondent

t test- It was applied for comparison of two small samples for before training (untrained) and after training (trained) rural youth. The t value was worked out by using the following statistics.

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}$$

Where,

$x1^{-}x1^{-}$ = Mean of first set of values
$x2^{-}x2^{-}$ = Mean of second set of values
S_1 = Standard deviation of first set of values
S_2 = Standard deviation of second set of values
n_1 = Total number of values in first set
n_2 = Total number of values in second set.

RESULTS AND DISCUSSION

Extent of knowledge

The extent of knowledge before and after training of rural youth regarding practices of plant propagation was assessed and data were summarized in table 1 and 2, respectively. Before training, it was observed that none of the practice have higher percentage and almost zero under complete known category though under unknown category, higher percentage was recorded for practices of plant propagation. The practice of higher percentage in unknown category were selection of scion and root stock and disease management and their control (97.87%) followed by knowledge of plant/ m^2 area (95.67%), use of weedicide (91.48%), knowledge about protected cultivation (82.98%), propagation of plant in net house (80.86%), time of propagation (78.72%), seed treatment (70.21%), maintenance of net house (59.57%). Similarly, the knowledge of practices of plant propagation, before training recorded higher percentages in partial known category were selection of cultivar (97.87%) followed by marketing of grafted plants (93.62%), use of balance dose of fertilizers (89.36%), maintenance of nursery raising (76.60%), importance of plant propagation (76.59%), insect pest management and their control (72.34%) and knowing technology of plant propagation (59.57%).

After acquiring training, the practices of higher percentage grouped into complete knowledge category were scientific method of nursery raising (100%), followed by knowledge of plant/m^2 area (95.74%), maintenance of net house and marketing of grafted plants (93.61%), knowledge about protected cultivation (89.36%), time of propagation (74.46%), seed treatment (61.70%) and propagation of plant in net house (44.68%). The practices of higher percentage in relation to the trained rural youth grouped into partial knowledge category were knowing technology of plant propagation and use of balance dose of fertilizers (76.60%) followed by use of weedicide (74.47%), disease management and their control and selection of cultivar (68.08%), selection of scion and rootstock (61.70%), Importance of plant propagation and insect pest management and their control (59.57%), maintenance of nursery (57.44%) and propagation of plants in net house (55.31%). But the practices of the trained rural youth grouped into unknown category, knowledge gap for all the practices recorded was zero. It showed all the trainees were aware about the practices and not unknown for any practices (Mbanso *et al,* 2012).

Table 1. Distribution of rural youth before training according to their extent of knowledge regarding selected practices of recommended plant propagation techniques (n=47).

Sr. No.	Practice	Extent of knowledge	
		Un known (%)	Partial known (%)
1.	Disease management and its control	97.87	2.12
2.	Importance of plant propagation	23.40	76.59
3.	Insect pest management and their control	27.66	72.34
4.	Knowledge about plant propagation	40.42	59.57
5.	Maintenance of nursery	23.40	76.60
6.	Plants per square meter area	95.67	4.26
7.	Propagation of plants in net house	80.86	19.15
8.	Scientific method of nursery raising	93.66	6.38
9.	Seed treatment	70.21	29.78
10.	Selection of cultivar	2.12	97.87
11.	Selection of scion and root stock	97.87	2.12
12.	Time of propagation	78.72	21.28
13.	Use of balance dose of fertilizers	10.63	89.36
14.	Use of weedicide	91.48	8.51
15	Maintenance of net house	59.57	40.43
16	Knowledge about protected cultivation	82.98	17.02
17	Marketing of grafted plants	6.38	93.62

The 't' test result reserved values for before and after training as well as t calculated which was higher than actual t value (Table 3). This indicated a significant ($p<0.05$) difference in the adoption level before and after the training. Highest significant values obtained for knowledge about scientific method of nursery raising (53.71%). Lowest 't' value obtained for use of balance dose of fertilizers (4.24%) and selection of cultivar (4.41). The overall 't' value obtained (9.04) was highly significant at 0.05 level of probability. This showed that respondents adopted production technologies more after the training (Kushwah and Kumar, 2017). It was therefore, important for rural youth to be trained properly regarding production of planting material.

Knowledge gap

The data (Table 4) revealed that overall knowledge gaps for the selected practices before and after training of rural youth were obtained 78.90 and 21.96 percent, respectively. As reported by the rural youth before training, the major contributing practices for this gap were selection of scion and root stock, disease management and their control (98.93%) followed by plant per square meter area (97.87%), use of weedicide (95.74%), knowledge about protected cultivation (91.48%), propagation of plant in net house (90.42%) and time of propagation (89.36%). However, after acquiring training, the major contributing practices for this gap were knowledge about of plant propagation and use of balance dose of fertilizers (38.29%) followed by use of weedicide (37.23%), selection of cultivar

Table 2. Distribution of rural youth after training according to their extent of knowledge regarding selected practices of recommended plant propagation techniques (n=47).

Sr. No.	Practice	Extent of knowledge	
		Partial known %	Completely known %
1.	Disease management and its control	68.08	31.91
2.	Importance of plant propagation	59.57	40.42
3.	Insect pest management and their control	59.57	40.42
4.	Knowledge about plant propagation	76.60	23.40
5.	Knowledge about protected cultivation	10.64	89.36
6.	Maintenance of net house	6.38	93.61
7.	Maintenance of nursery	57.44	42.55
8.	Marketing of grafted plants	6.38	93.61
9.	Plant per square meter area	4.26	95.74
10.	Propagation of plant in net house	55.31	44.68
11.	Scientific method of nursery raising	0	100.00
12.	Seed treatment	38.30	61.70
13.	Selection of cultivar	68.08	31.91
14.	Selection of scion and root stock	61.70	38.30
15	Time of propagation	21.28	74.46
16	Use of balance dose of fertilizers	76.60	23.40
17	Use of weedicide	74.47	25.53

Table 3. Extent of adoption of recommended plant propagation techniques by respondents.

Sr. No.	Practice	t value
1.	Diseases management and their control	19.24*
2.	Importance of plant propagation	6.83*
3.	Insect pest management and their control	7.86*
4.	Knowledge about plant propagation	6.93*
5.	Knowledge about protected cultivation	25.24*
6.	Maintenance of net house	17.97*
7.	Maintenance of nursery	6.49*
8.	Marketing of grafted plants	26.36*
9.	Plant per square meter area	34.62*
10.	Propagation of plant in net house	12.69*
11.	Scientific method of nursery raising	53.71*
12.	Seed treatment	13.64*
13.	Selection of cultivar	4.41*
14.	Selection of scion and root stock	19.22*

15	Time of propagation	18.60*
16	Use of balance dose of fertilizers	4.24*
17	Use of weedicide	14.22*

*Significant at 0.05% level

Table 4. Knowledge gap regarding selected practices of plant propagation techniques.

Sr. No.	Scientific practice selected	Before training			After training		
		Knowledge score obtained	Knowledge gap (%)	Rank	Score obtained	Knowledge gap %	Rank
1.	Importance of plant propagation	36	61.70	XII	66	29.78	VI
2.	Knowledge about plant propagation	28	70.21	X	58	38.29	I
3.	Selection of scion and root stock	1	98.93	I	65	30.85	V
4.	Use of balance dose of fertilizers	42	55.31	XIII	58	38.29	I
5.	Use of weedicide	4	95.74	III	59	37.23	II
6.	Diseases management and its control	1	98.93	I	62	34.04	IV
7.	Insect pest management and their control	34	63.82	XI	66	29.78	VI
8.	Maintenance of nursery	36	61.70	XII	67	28.72	VII
9.	Scientific method of nursery raising	3	96.80	IV	94	0.0	XIV
10.	Selection of cultivar	46	51.06	XV	61	35.10	III
11.	Seed treatment	14	85.10	VIII	76	19.14	IX
12.	Plant per square meter area	2	97.87	II	92	2.13	XIII
13.	Time of propagation	10	89.36	VII	84	10.63	X
14.	Propagation of plant in net house	9	90.42	VI	68	27.65	VIII
15	Maintenance of net house	19	79.78	IX	91	3.19	XII
16	Knowledge about protected cultivation	8	91.48	V	89	5.32	XI
17	Marketing of grafted plants	44	53.19	XIV	91	3.19	XII

Overall knowledge gap for all selected practices obtained 78.90 before training & 21.96 after training, t value 9.04*

*Significant at p=0.05 ** Significant at p= 0.01

(35.10%), disease management and their control (34.04%), importance of plant propagation and insect pest management and their control (29.78%). Kushwah *et al* (2016) and Prakash *et al* (2004) found similarly findings as in the present investigation in relation to knowledge gap.

CONCLUSION

It may be concluded that more than sixty per cent of the rural youth was under complete knowledge level of adoption category; whereas the extent of adoption of most of the recommended practices was found to be significantly higher for all the practices. The probable reason for high adoption was because of the fact that all the above practices were felt to be more important for getting higher yield. Hence, in order to enhance the adoption of scientific plant propagation practices by rural youth, they should be facilitated with latest technology know-how and motivated by imparting skill based capacity building programme. Besides, concentrated efforts should be made by line departments to offer technical support, guaranteed market linkage, value addition facilities and other input supply service to different stakeholders that may create entrepreneurial opportunity in establishment of nurseries by rural youth. Production of planting material/ nursery raising training has been successful in producing a significant impact on the respondents. The study revealed that there had been a positive contribution of the training programme in terms of knowledge, skill and adoption of selected trainees.

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