RESEARCH NOTE

Evaluation of Technology Dissemination through Demonstration on the Yield of Kharif Onion

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ABSTRACT

Onion (Allium cepa) is one of the most important bulb crops in India, which plays a major role in supplementing the income of small and marginal farmers of Kurnool District in Andhra Pradesh. One of the major constraints of kharif Onion farming is poor nursery and low productivity due to non adoption of recommended package of practices and improved verities. To replace this anomaly, National Horticultural Research and Development Foundation, Kurnool (A.P.) had conducted TDTD (Technology Dissemination through Demonstration) under National Horticulture Mission, Govt. of India, at adopted farmers' fields. Cultivation practices comprised under TDTD viz., use of improved variety/season specific, Nursery Raising, Soil/Seed treatment, Transplanting, fertilizer application and control of Purple Blotch disease, showed that percentage increase in the yield of Onion ranged from 31.31% to 37.50% over local check during the course of study from 2005-06 to 2009-10. The technology gap of 18.2 q/ha during 2009-10 from 33.8 q/ha at the initial stage of study (2005-06) shows the gap in demonstration yield over potential yield, but the above gap reduced subsequently in the following years.

Key words: *Technology dissemination; Demonstration, Technology gap; Extension gap; Technology index; Onion;*

In India onion occupies 75.7 million ha area with total production of 13005.10 MT (2010-11). Andhra Pradesh accounts for 5.33% and 4.83% of area and production, respectively in the country with the average yield of 15.56q/ha which is equivalent to the national average 15.24q/ha.Onion is one of the major sources of income even to the marginal and small farmers in Kurnool district. The production and productivity of onion in Andhra Pradesh are low compared to Gujrat, Maharastra and other onion growing states (*Gupta and Singh, 2010*). Unawareness of the farmers about suitable seasons, varieties for different seasons, Climate, Soil and improved cultivation techniques are the main reasons, unawareness of the characteristic of the varieties, seasonalities and adoption of proper package of practices are also the reasons responsible for limiting the production and productivity of onion directly or indirectly (*Pandey and Bhondey, 2002*).

In Kurnool Kharif season for big onion is also common where seeds are sown in May-June, transplanted in July- August and harvested in Nov-December. Onion production by transplanting and direct sowing both methods in Kharif has been common in Kurnool (*Ruth et al, 2010*). The improved technology packages were also found to be financially attractive. Yet, adoption levels for several components of the improved technology were low, emphasizing the need for better dissemination (*Kiresur et al, 2001*). Several biotic, abiotic and socio-economic constraints inhibit exploitation of the yield potential and these needs to be addressed (*Singh et al, 2007*). Kurnool district has the sizeable area under onion cultivation but the productivity level is very low. Keeping the above point in view, the TDTD (Technology Dissemination through Demonstration) on Kharif onion by using new crop production technology was started with the objectives of showing the productive potentials of the new production technologies under real farm situation over the locally cultivated Kharif onion crop

METHODOLOGY

The present study was carried out by the NHRDF, Kurnool (A.P.) during kharif season from 2005-06 to 2009-10 (5 years) in the farmers' fields of eight adopted villages viz. Panchlinga, Pudur, Chennatekur, Chandrashekher nagar and Bheemavaram, in Kurnool

district of Andhra Pradesh. In total 258 TDTD in 82 ha area were conducted covering different villages. Materials for the present study with respect of TDTDs and farmers practices were given in Table 1. In case of local check plots, existing practices being used by farmers were followed. In general soils of the area under study were sandy loam to red loamy sand and medium to low in fertility status. The TDTD was conducted to study the gaps between the potential yield and demonstration yield, extension gap and technology index. In the present evaluation study, the data on output of kharif onion cultivation were collected from TDTD plots, besides the data on local practices commonly adopted by the farmers of this region were also collected.

Technology gap = Potential yield – Demonstration yield

Extension gap = Demonstration yield – yield under existing practice

$$\text{Technology index} = \frac{\text{Potential yield - demonstration yield}}{\text{Potential yield}} = 100$$

In demonstration plots, a few critical inputs in the farm of quality seed, *Tricoderma viridi* balance fertilizers, Agro-chemical, etc. were provided and non-monetary inputs like timely sowing in raised bed low tunnel, poly house, transplanting on ridges were also performed. Traditional practices were maintained in case of local checks. The farmers involved in demonstration were facilitated by NHRDF experts/ scientist in performing field operations like nursery sowing, transplanting, irrigation, spraying, weeding, harvesting etc. during the course of training and visit. The technologies demonstrated are mentioned in Table 1 and compared with local practices.

RESULTS AND DISCUSSION

Result of 258 demonstrations conducted during 2005-06 to 2009-10 in 82 ha. area on farmers field of eight villages of Kurnool district indicate that the cultivation practices comprised under TDTD viz.,use of improved verities (Agrifound Dark Red), raised bed nursery raising, seed and soil treatment, transplanting on ridges, fertilizer application (N:P:K @ 150:40:50 kg/ ha) and control of purple blotch (*Alternaria porri*), produced on an average 34.57% more yield of kharif onion as compared to local check (147.78 q/ha.). The result indicates that the TDTD has given a good impact over the farming community of Kurnool district as they were motivated by the new agricultural technologies applied in the TDTD plots. Data further showed that the yield of onion in the following years increased successively which clearly speaks of the positive impact of TDTD over existing practices of kharif onion cultivation (Table 2). Moreover from first year onwards, farmers cooperated enthusiastically in carrying out of TDTDs, which lead to encouraging results in the subsequent years. The technology gap observed may be attributed to the dissimilarity in the soil fertility status and weather condition. Hence, variety wise location specific recommendation appears to be necessary to minimize the technology gap for yield level in different situations. The extension gap ranged from 45.6 q/ha to

Table 1. Particulars sowing the details of kharif Onion production under TDTD and existing practices

Operation	Existing Practice	Improved practices demonstrated
Use of seed	Local Seed	ADR, an improved variety from NHRDF, Nasik. Specially recommended for kharif season.
Nursery Rising	Flat bed or direct seed sowing without mulching	Low tunnel poly-house and raised bed (3 m x 0.6 m size, raised up to 15-25 cm.) proper management of drainage and mulching.
Soil/Seed treatment	No any treatment	Soil treatment with Carbendazin @ 4 gm / m² & Seed treatment with Thiram @ 2 gm / kg.
Transplanting	Flat bed without labeling	Small size (4x3 m) bed with ridges in 15 cm distance. Spacing- Row to row – 15 cm. Plant to plant – 10 cm.
Irrigation	Regular Flood	In 1/3 rows as and when required.
Fertilizer application	80:40:0 (N: P: K Kg./ ha.)	150:40:50 (N:P:K Kg./ha.), P through Single super phosphate as it contains 12 % Sulphur.
Control of Purple Blotch (Alternaria Porri)	No any control measures	Two spraying of Indofil M-45 @ 0.25% along with Triton stickers @ 0.06%. First spray after 30 DAP and second is after 45 DAP.

Table 2. Exploitable productivity, technology gaps, technology index, extension gaps and cost benefit ratio of kharif onion grown under TDTD and exiting package of practices

Year	Area (ha.)	No. of TDTD	Yield (Q/ha.)		% increase over existing	Extension gap (q/ha.)	Technology gap (Q/ha)	Technology index (%)	Cost benefit ratio	
			TDTD	Existing Practice					TDTD	Existing Practice
2005-06	12	42	191.2	145.6	31.31	45.6	33.8	15.02	2.82	1.17
2006-07	15	51	194.3	147.3	31.90	47.0	30.7	13.64	2.96	1.35
2007-08	15	45	198.6	146.9	35.19	51.7	26.4	11.73	3.28	1.62
2008-09	20	58	201.4	148.7	36.97	52.7	23.6	10.48	3.69	2.36
2009-10	20	62	206.8	150.4	37.50	56.4	18.2	8.08	4.12	2.86

56.4 q/ha. It indicates the need to convince the farmers for the adoption of improved agricultural production technologies with high yielding varieties, which will subsequently change alarming trend of galloping extension gap. The new technologies will eventually lead to the farmers to discontinue old verities with the new high yielding varieties.

The technology index shows the feasibility of the evolved technology at the farmer's fields. The lower value of technology index indicates more feasibility of the technology. As such, reduction of technology index from 15.02 % (2005-06) to 8.08% 2009-10 exhibited the feasibility of technology demonstrated (Table 2).

CONCLUSION

By conducting TDTDs of proven technologies, yield potential of kharif onion can be increased to a great extent. This will substantially increase the income as well as the livelihood of the farming community. There is a need to adopt multi-pronged strategy that involves enhancing kharif onion production through improved technologies in Kurnool district. This should be brought to the access of farmers through transfer of technology centers like NHRDF, KVKs etc.

Paper received on (after revision) : March 16, 2012
Accepted on : October 22, 2012

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