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Original Research Article

Integrated Crop Management in Small Onion – An Impact of Frontline Demonstrations on Yield and Economics

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A B S T R A C T

Small onion is an important bulbous crop grown in Nagamangala taluk of Mandya district covering an area 400ha with production on an average 6000 tons per year, a study on integrated crop management in small onion was conducted during 2018 and 2019 under front line demonstrations with the active participation of the farmers. One of constraints for low productivity of small onion in area is because of non-adoption of recommended practices. Thus improved practice of integrated crop management the use of biofertilizers such as azospirullum and phosphorus solubilizing bacteria, organic manures and soil test based application of fertilizes, micronutrient formulation and use of neem soap was administered to the farmers. The data related to the cost of cultivation, production, gross return and net returns were collected as per schedule in both seasons. The results pooled from the two years revealed that an increase in yield in demonstration recorded (169.07 q ha^{-1}) as compared to farmers practice (146.43 q ha^{-1}) which is attributed to increase in bulb diameter (4.65 cm and 3.26 cm) and number of splitted bulb (8.0 and 6.3) in demonstration as compared to farmers practice respectively. The percent increase in yield of 15.46, higher net returns Rs.159455 and B:C ratio 1: 2.93 and an improvement in soil nutrient status was recorded in demonstration over farmers practice. The study indicated gap existed in yield is due to imbalanced nutrition and improper pest and disease management, thus the yield and economics of small onion can be boosted by adopting the recommended technologies.

Keywords

Farmers practice, Demonstration, Small onion, Frontline demonstration

Introduction

Small onion is bulb crop belonging to family Alliaceae, an important crop used as salad and spice, it has its own unique taste and flavour which enhances the taste of food (Mishra *et al.*, 2013) and the green leaves and bulb are edible and utilised for preparations. The duration for cultivation required is less and have a higher concentration of water as opposed to solid fiber content (Abuga, 2014). It is used both in immature and mature bulb stage. The pungency in onion is due to sulphur-bearing compound in very small quantity(about 0.005%) in the volatile oil allyl propyl disulphide($C_6H_{12}S_2$). The colour of the outer skin of onion bulbs is due to quercetin. India is next to China in area(9.59 Lakh ha) and production of onion (163.09Lakh ton) (Goyal *et al.*, 2017).

In Mandya district of Karnataka small onion is grown in an area of 627ha with a production of 10245t out of which 400ha area

covered under Nagamangala taluk alone with a production of 6000t annually (Anonymous, 2016). There were problems encountered with respect to the nutrients and pest and disease management and in the light of the above the present study was conducted in the farmers field at the Nagamangala taluk of Mandya District of southern dry zone of Karnataka with receiving an annual rainfall of 760mm annually.

The frontline demonstrations is an extension tool utilised to introduce suitable agricultural practice like high yielding varieties, seed treatment, spacing, timely sowing, nutrient management based on soil test, balanced application of fertilizers and micronutrients, pest and disease management etc. to the farmers along with extension programmes method demonstrations, trainings and field day) for dissemination of the technology. There is always a gap in yield because of non-adoption of improved technologies which can be reduced on utilizing a simple tool.

Materials and Methods

The present study was carried out by the ICAR-Krishi Vigyan Kendra, Mandya, Karnataka during total 20 demonstrations 10 each in every year during 2018 and 2019 experimented respectively. The improved technologies integrated crop management the use of biofertilizers such as azospirullum and phosphorus solubilizing bacteria, organic manures and soil test based application of fertilizes, micronutrient formulation and use of neem soap was administered to the farmers with application of FYM @ 30t/ha + Azospirillum @ 2kg /ha + PSB @ 2 kg /ha, and soil test based application of nutrients with NPK 125:75:125 kg/ha (50% N & 100% P, K as basal dose, remaining 50%N @ 30 DAS), maintentance of proper row (38 cm) spacing and sowing in ridges and furrows, Neem soap 1% for thrips and mites, Yellow sticky traps 25 No./ha and micronutrient formulation Vegetable special 3 g/ L. The micronutrient formulation vegetable special was administered at 30 and 45 days after sowing.

The crops were harvested at perfect maturity stage manually. Soil of the study area was sandy to sandy loam with medium fertility. The critical inputs in the form of bio-agents and micronutrient formulations provided to farmers. Other inputs farm yard manure, fertilizers and agro-chemicals were managed by farmers as per recommendation of scientists of KVK. Yield data was recorded and pooled data of two years 2018 and 2019 was analysed in addition to economics analysis and extension gap.

Results and Discussion

Productivity comparison between demonstration and farmers practice indicated evidently sustainable higher yield of onion in 2018 and 2019 under demonstration plots (169.52 and 168.63 q ha^{-1}) as compared to farmer practice (146.1 and 146.76 q ha^{-1}) respectively. The percentage increase in yield was 16.03% and 14.89% during 2018-19 over farmers practice indicating definitely a extension gap (Table 1 and 2).

Similar yield enhancement due to introduction of improved technology were documented by Kumar *et al.,* (2010); Dhaka *et al.,* (2010); Dhaka *et al.,* (2015) and Dilip Singh, 2017. Hence from the results it is evident that the demonstrations on improved technology in small onion performed better than the farmers practice under similar environmental condition with the extension gap of 22.6 q ha^{-1}. Conducting field day to disseminate the technology motivated the farmers by seeing the results in terms of production as per the saying “Seeing is believing”.

Table.1 Yield and extension gap of demonstration during 2018 and 2019

Variables	Yield (q ha^{-1})		Percent increase over farmers practice		Extension gap (q ha^{-1})
	2018	2019	2018	2019	
Farmers practice	146.10	146.76	16.30	14.89	22.64
Demonstration	169.52	168.63			

Table.2 Economics of front line demonstration during 2018 and 2019

Variables	Gross returns (Rs.)		Net returns (Rs.)		B:C ratio	
	2018	2019	2018	2019	2018	2019
Farmers practice	204550	205472	133139	132082	2.56	2.79
Demonstration	237332	236076	160607	158304	2.83	3.03

Economics of frontline demonstration

The results on economics analysis of small onion production under front line demonstration was recorded and indicated higher gross returns (Rs.237332 and Rs.236076) and net returns (Rs.160607 and Rs.158304) with higher benefit cost ratio of (1:2.83 and 1:3.03) recorded during 2018 and 2019 respectively indicating the higher profitability and economic viability of the demonstration. The results are in accordance with findings Dhaka *et al.*, (2010); Dhaka *et al.*, (2015). Based on the study it can be concluded that front line demonstrations of improved technology reduces the extension gap to a considerable extent, leading to increased productivity of small onion in Nagamangala Taluk. The extension tools adopted have created awareness among farmers and have adopted the technology and enabled to gain higher yields.

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