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Evaluation of Frontline Demonstrations on Weed Management in Groundnut

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Abstract

There is a tremendous opportunity for increasing the production and productivity of groundnut crop by adopting the improved technologies. The main objective was to minimize the adoption gap and to increase the productivity. Total 10 Crop Demonstrations on groundnut variety K-6 was conducted at farmers' fields in district Khammam (Telangana) during two consecutive *rabi* seasons 2012-13 and 2013-14. Farmer's practice (FP) involved manual weeding and Demonstration practice (DP) included spraying of Imagithapyr (Persuit @ 300ml acre^{-1} as post emergence weedicide at 20 DAS). On overall average basis, 11.77 % higher grain yield was recorded under demonstrations than the farmers traditional practices (check). The extension gap, technology gap and technology index were 182.5, 767.5 and 30.7 respectively. Data on technology index (30.7) exhibited the feasibility of technology demonstration.

Keywords: Groundnut, economics, gap analysis, grain yield, technology gap

1. Introduction

Groundnut is called as the 'King' of oilseeds. Groundnut is also called as wonder nut and poor men's cashew nut. Groundnut is one of the most important cash crops of our country. It is a low-priced commodity but a valuable source of all the nutrients. Groundnut is grown on 26.4 million ha worldwide with a total production of 37.1 million metric t and an average productivity of 1.4 metric t ha^{-1}. Developing countries constitute 97% of the global area and 94% of the global production of this crop. The production of groundnut is concentrated in Asia and Africa (56% and 40% of the global area and 68% and 25% of the global production, respectively). Weed problem is severe in early stage of groundnut because of its slow growth. The competition is from both grasses and broad-leaf weeds. The important weed flora is *Cyperus rotundus*, *Digitaria sanguinalis*, *Chloris barbata*, *Commelina benghalensis*, *Cynodon dactylon*, *Celosia argentia*, *Amaranthes viridis*, *Cleome viscose*, *Portulaca oleracea*, *Trichodesma indicum*, *Boerhavia diffusa* and *Eclipta alba*. Critical period for weed growth is 20-45 DAS. Losses are as high as 70%. When once pegging begins (40 DAS), there should not be any disturbance to pegs through manual or mechanical weeding. Post-emergence application of imagithapyr 0.75 kg ha^{-1} at 20 days after sowing controls the mixed growth of grasses and BLW.

Out of the losses due to various biotic stresses, weeds are known to account for nearly one third. Weeds are major impediment to groundnut production through their ability to compete for resources and their impact on product quality. The extent of yield losses is up to 62% during the *kharif* season and up to 47% during the summer season. However, Giri et al. (1998) reported an average yield loss of 89% due to weed infestation in irrigated summer groundnut.

Despite availability of several new generation selective herbicides for groundnut with different mechanisms of action, farmers continue to use the same herbicide season after season, which results in reduced efficacy of the herbicide as well as development of herbicide resistance. Further, severe labour scarcity and very high cost of labour hiring in intensively cultivated areas is forcing the farmers to rely entirely on herbicides for weed management. In view of the above factors, frontline demonstrations were conducted on farmer's fields to demonstrate the weed management technology in groundnut exclusively with herbicides and comparing it with the farmer's practice in terms of yield and economics.

2. Materials and Methods

The present study was carried out by KrishiVigyan Kendra, Wyra, of Acharya N. G. Ranga Agricultural University, during *rabi* season of 2012-13 and 2013-14 years. The soils of the study were light soils. In total 10 demonstrations on 2 hectare (each demonstration in 2000 m^2 area) were conducted on farmers' fields. The main objective of this study was to minimize the adoption gap and to increase the productivity. The general objective of Front line demonstration is to demonstrate under farmer's field condition, the superior production potentials and benefits of the latest improved technologies. Farmer's practice (FP) involved manual weeding and Demonstration practice (DP) included spraying of Imagithapyr (Persuit @ 300 ml acre^{-1} as post emergence weedicide at 20 DAS). Crop was sown during first week of November with 30 cm row to row spacing and 10 cm plant to plant distance. All other recommended package of practices fertilizer application, plant protection was uniformly followed in both methods. The variety used was kadiri-6. Visited and monitored the demonstration sites at an interval of 10-15 days during the crop growing period. Finally information on seed yield, cost of cultivation and returns was collected. The mean of two years data was calculated and presented (Table 1 and Table 2). Field day also organized at harvesting stage of the crop. Field days were organized at the demonstration sites with a view to transfer the technology to a large group of farmers across the state (Ramanjaneyulu et al., 2014). Yield was recorded in the farmer's fields at the time of harvest. The extension gap, technology gap and the technology index were worked out as per formulae.

Technology gap = Potential yield – Demonstration yield

Extension gap = Demonstration yield - yield under Farmers practice

Technology index = {(Potential yield – Demonstration yield) ÷Potential yield} × 100.

3. Results and Discussion

On an average, yield advantage of 11.77% was recorded during two years of demonstration. Recorded narrow extension gap than the technology gap indicate resource related constraints such as soil fertility, climate suitability, general pest and disease load during the season. The difference in technology gap in different fields is due to better performance of recommended varieties with recommended practices and more feasibility of recommended technologies during the course of study with the other factors like monitoring by farmers, soil type and fertility status of the fields. Similarly, the technology index for the years in the study was in relevance with technology gap (Gohil et al., 2016).

Lower cost of cultivation due to exclusion of hiring the manual labour for weeding was noticed. Higher yields and lower COC in DP resulted in higher gross and net returns. The technology index (Table 1) shows the feasibility of the evolved technology at farmers' field. However, higher B:C in DP (2.38) clearly indicate the potential of this technology (weed management in groundnut exclusively with use of herbicides) for adoption, which resulted in efficient weed control and higher yields resulting higher B:C in DP compared FP.

Table 1: Seed yield and gap analysis of FLDs in groundnut at farmers' field (Mean of 2 years)

Sr. No.	Potential yield (kg ha^{-1})	DP Yield (kg ha^{-1})	FP yield (kg ha^{-1})	Yield hike over FP (%)	Extension Gap (kg ha^{-1})	Tech. gap (kg ha^{-1})	Technology index
1	2500	1732.5	1550	11.77	182.5	767.5	30.7

Table 2: Economic analysis of weed management in groundnut on farmers' field (Mean of 2 years)

Sr. No.	Cost of cultivation (COC)		Gross Returns		Net Returns		Additional returns	Benefit : Cost	
	DP	FP	DP	FP	DP	FP		DP	FP
1	38750	42750	92437	82875	53687	40125	13562	2.38	1.93

4. Conclusion

On overall average basis, 11.77 % higher grain yield was recorded under demonstrations than farmers' traditional practice (check). Extension gap, technology gap and technology index were 182.5, 767.5 and 30.7, respectively. Data on technology index (30.7) exhibited feasibility of technology demonstration. However, higher B:C in DP (2.38) clearly indicated potential of this technology (weed management in groundnut exclusively with use of herbicides) for adoption, which resulted in efficient weed control and higher yields resulting higher B:C in DP compared FP.

5. References

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