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Research Note

Assessment of Technological Gap and Performance of Combined Management Approach for Pod Borer in Chickpea

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Chickpea [*Cicer arietinum* Linn.] is one of the important and oldest pulse crop cultivated in India and occupying 7.10 million hectares area and contributing 5.75 million tones yield to the national pulse basket. It is grown through out the country excepting on high altitude of northern and north eastern regions and coastal peninsula. The major chickpea producing states are Andhra Pradesh, Madhya Pradesh, Rajsthan, Uttar Pradesh, Maharastra, Haryana, Karnataka, Gujrat, Bihar and West Bengal. The area production and productivity of chickpea in the states of Uttar Pradesh 6764884 hectares, 500799 metric tonnes and 7.42q/ha., respectively. Some districts of Uttar Pradesh i.e. Banda and Hamirpur have more than one lakh hectare area under chickpea. Highest productivity has been reported from Azamagarh and Mau(1269 kg/ha). The area, production and productivity of chickpea in the district Balrampur of Uttar Pradesh are 490 hectares, 366 metric tonnes and 7.48 q/ha, respectively.

The gram pod borer *(Helicoverpa armigera* (Hubner) is a major pest of chickpea accounting for 75% pod damage in the crop like chickpea and pigeon pea (Krishna Kant *et al.,* 2007). This pests constitute a major constraint to increased production. The earlier recommended insecticide becoming either less effective or banned due to environmental hazards. Presently, large number of plant protection measures are used to minimize these losses but farmers are not aware of combined management approach for pod borer. Therefore, present study was carried out at farmers field as on farm trial (OFT). The on farm trial conducted under the close supervision of scientist of the KVK. The basic objectives of OFT are to identify existing practices that may help solve major problems of many farmers in defined areas and also create awareness/establishment of new management technologies available.

METHODOLOGY

The on farm trial (OFT) on chickpea for pod borer management was conducted by Krishi Vigyan Kendra, Pachpedwa, Balrampur(U.P.) during the Rabi season 2006-07 and 2007-08 at farmers fields the five villages of two blocks i.e. Pachpedwa and Gaisaree. Technological gap between improved management package and farmers practices were studied based on survey and group discussion with farmers interactive group (FIG) of chickpea growers in selected cluster villages. The farmers of this villages had small and marginal land holding. The total number of farmers were 100, out of these 20 farmers were selected at randomly separately from each village and seven improved management package were selected to study the technological gap. Among these, the eight number of innovative farmers were selected for on farm trial (OFT) programme during both the year.

The on farm trial OFT on chickpea for pod borer management technology was taken in an area of 0.2 hectare of each farmers. The total 1.6 hectares area was covered in two years for trial of recommended improved pod borer management practices of chickpea. The chickpea variety Awarodhi was sown with three treatment and four replications. In OFT, one control plot was also kept where farmers practices (no spray of insecticide) was carried out and designated as T1. Relative efficacy of two insecticides viz., Neem oil @/2 Liter/ha and Monocrotophos 36 EC @ 1.5 Liter/ha were evaluated.

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In T2 treatment, Neem oil @ 2 liter/ha (alone) @ 2 litre/ ha spraying was commenced at 50% flowering and repeated at 50% podding and in T3 treatment, a combined management approaches were undertaken to evaluate in combination with Neem oil @ 2 liter/ha (first spray at 50% flowering) and Monocrotophos @ 1.5 lit/ ha (second spray at 50% podding) against pod borer in chickpea. Performance of insecticide against pod borer was observed in terms of the percentage of pod damage due to pod borer on the basis of affected pod in relation to total pods in respective treatment.

Benefit cost ratio of each treatment was also assessed. Farmers reactions were

observed with the help of personal interview and qualitative data was converted

into quantitative form and expressed in terms of per cent increase yield was

calculated by using following formula.

$$\text{Percent increase yield} = \frac{\text{OFT demonstrated yield-farmers practices yield} \times 100}{\text{Farmers practices yield}}$$

RESULTS AND DISCUSSION

The data given in table 1 revealed that the farmers were not aware recommended improved crop production technology i.e. HYV, seed rate, sowing method, balance dose of fertilizer, seed treatment, weed management and plant protection measures due to lack of knowledge about advantage of improved management package. The farmers were using local variety/non identified variety and are not using the recommended sowing method and seed rate also. As per recommendation 18 Kg N, 46 Kg P_2O_S and 20 kg sulpher in sulpher deficient soil per hectare should be applied as a basal dressing at the time of sowing but the farmers were not using fertilizers. The reason of not using recommended dose of chemical fertilizer were mostly attributed by the farmers to the lack of knowledge behind the importance of balanced dose of fertilizer in pulse crop. Seed is to be treated by biofungicide i.e. *Trichoderma* and *Rhizobium* culture for wilt management and better nodulations (nitrogen fixation), respectively. The analysis reveals that the farmers were not using recommended seed treatment technique and they were not also following weed management practices. The chickpea crop suffers from severe narrow and broad leaf weed infestation and it also provides shelter for insect pest and diseases which cause in drastic reduction in grain yield. Therefore, it is advisable to keep the field free from weeds. One and two hand weeding should be done for better crop growth. It is because of lack of knowledge about seed treatment and losses in productivity due to weed infestation in chickpea crop. Wilting and pod borer are also major constraints of reduction in productivity of chickpea crop. As regards plant protection measure the data revealed that farmers were not using plant protection measures. The lack of knowledge about pest control and combined management approach in chickpea crop was the important reason behind this.

The incidence of pod borer during kharif 2006-07 and 2007-08 was compared (Table 2) in terms of mean percentage pod damage per plant. The effect of

Table 1. Technological gap between improved management package and farmers practices under OFT on chickpea.

Sl. No.	Particulars	Improved management package	Farmers Practices
1.	Variety	Awarodhi	Local
2.	Seed rate	100 kg/ha	50-60 kg/ha
3.	Sowing method	Line sowing with seed drill (30 x 10 cm), 8-10 cm. deep	Broadcasting
4.	Situation	Rainfed	Rainfed
5.	Fertilizer dose	100 kg DAP (18 kg N:46 kg P2 O5) and 20 kg sulphur/ha	Nil
6.	Seed treatment	*Trichoderma* @ 5 g/kg seed and *Rhizobium* culture @ 200 g/10 kg	No seed treatment
7.	Weed management	One to two hand weeding	No weeding
8.	Plant protection measure	Need based biological and chemical insecticide spray	No spray of insecticide

treatments on pod damage, grain yield and B:C ratio indicated that mean percentage pod damage was inversely correlated with grain yield. Out of various treatments, T3 (Neem oil @ 2 Lit/ha, 1st spray at 50% flowering + Monocrotophos, @ 1.5 lit/ha, 2nd spray at 50% podding) was found to be most effective in controlling pod borer as least percent pod damage i.e. 11.38 percent and 10.78 per cent in both the years followed by T2 (Neem oil @ 2 Lit/ha, twice, 1st spray at 50% flowering and 2nd spray at 50% podding) and T, (no spray of insecticide) treatment. The highest average yield i.e. 13.2 q/ha in 2006-07 and 13.6 q/ha in 2007-08 and benefit cost ratio i.e. 2.32 in 2006-07 and 2.44 in 2007-08 were recorded in T3 (Neem oil @ 2 Lit/ha, 1st spray at 50% flowering + Monocrotophos, @ 1.5 lit/ha, 2nd spray at 50 % podding) treatment. The results clearly indicated that due to knowledge and adoption of appropriate production technology and plant protection measures, the yield of chickpea could be increase by 59.45 per cent in T2 (Neem oil @ 2 Lit/ha, twice, 1st spray at 50% flowering and 2nd spray at 50% podding) treatment and 78.38 per cent in T3 (Neem oil @ 2 Lit/ha,1st spray at 50% flowering + Monocrotophos, @ 1.5 lit/ha, 2nd spray at 50 % podding) treatment (2006-07) and 60.52 per cent in T2 (Neem oil @ 2 Lit/ha,1st spray at 50% flowering and 2nd spray at 50% podding) and 78.95 per cent in T3 (Neem oil @ 2 Lit/ha,1st spray at 50% flowering + Monocrotophos, @ 1.5 lit/ha, 2nd spray at 50 % podding) treatment (2007-08) over the yield obtained under farmers practices (no spray of insecticide). Farmers reactions about T3 treatment was good because due to adoption of combined management approach while in T 2 treatment was also fair because due its ecofriendly nature. The present results are in agreement with the findings of Singh and Yadav (2007).

So , it is clear that improved crop production technology and combination with bio pesticides for pod borer management was better and economical, it was also much encouraging for the farmers to adopt these technology. The on farm trial produced a significant positive results and providing potential and profitability of the improved technology under real farm situation which they have been advocating for a long time.

Table 2. Performance of combined management approach for pod borer in chickpea.

Year	Treatments	Mean percentage of damaged pod/plant	Average yield(q/ha) over	% increase the yield practices	Net Return (Rs/ha)	B:C ratio in farmers
2006-07	T1 = Farmers practices (No spray of insectcide)	43.10	7.4	-	9522	1.06
	T2= Neem oil @ 2 Lit/ha (twice 1st spray at 50% flowering and 2nd spray at 50% podding)	20.45	11.8	59.45	19568	1.97
	T3=Neem oil @ 2 Lit/ha (1st spray at 50% flowering) + Monocrotophos, @ 1.5 lit/ha (2nd spray at 50% podding)	11.38	13.2	78.38	23121	2.32
2008-09	T1= Farmers practices (No spray of insectcide)	41.53	7.6	-	10022	1.11
	T2= Neem oil @ 2 Lit/ha (twice 1st spray at 50% flowering and 2nd spray at 50% podding)	18.47	12.2	60.52	20568	2.07
	T3= Neem oil @ 2 Lit/ha (1st spray at 50% flowering)+ Monocrotophos, @ 1.5 lit/ha (2nd spray at 50% podding)	10.78	13.6	78.95	24121	2.44

* Cost of grain yield has been estimated at prevailing market rate i.e. Rs. 2500=00 per quintal.

CONCLUSION

There was a technological gap between improved management package and farmers practices in chickpea crop. The adoption of recommended improved crop production technology and plant protection measure was poor. The on farm trial programme was an effective in changing attitude, skill and knowledge of combined management approach for pod borer in chickpea. This also improved the relationship between farmers and KVK scientists and built confidence between them. Out of various treatments T3 (Neem oil @ 2 Lit/ha, 1st spray at 50% flowering + Monocrotophos, @ 1.5 lit/ha, 2nd spray at 50% podding) was found most effective in controlling pod borer as least number of infected plant/m² as well as damaged pod per plant followed by T2 (Neem oil @ 2 Lit/ha, twice, 1st spray at 50% flowering and 2nd spray at 50% podding) and T1 (no spray of insecticide). The highest benefit cost ratio was recorded in T3 (Neem oil @ 2 Lit/ha, 1st spray at 50% flowering + Monocrotophos, @ 1.5 lit/ha, 2nd spray at 50% podding) treatment because of most effectiveness as well as ecofriendly in nature. Under the farmer's feedback, it was observed the use of combined management approach for pod borer in chickpea was highly acceptable, easily compatible in existing cropping system of the farmers.

REFERENCES

Singh, S.S. and Yadav, S.K. (2007). Comparative efficacy of insecticides, biopesticides and neem formulations against *Helicoverpa armigera* on chickpea. 15 (2): 299-302.

Krishna Kant, Kanaujia, K.R. and Kanaujiya, S. (2007). Role of plant density and abiotic factors on population dynamics of *Helicoverpa armigera (*Hubner) in chickpea. 15 (2): 303- 306.