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Impact of Integrated Pest Management Technologies in Rainfed Cotton and Created Job Opportunities for Rural Youth and Farm Women in the Mysore District of Karnataka

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ABSTARCT: *Long staple cotton is important crop of Mysore district, growing in an area 52,000 ha with productivity of 459 kg/ ha. Lower productivity is mainly due to crop grown under* rainfed *situation and incidence of insect pest (15 -20%). To overcome the loss due to insect pest and reduce plant protection cost/ha, the Krishi Vigyan Kendra, has intervened by the implementing IPM technologies in 9 villages of H.D.Kote taluk during 2005, 2006 and 2007 in the 200 ha with 200 farmers. Continuously three years implementation of IPM technologies, impact study was conducted in IPM and Non IPM farmers. Based on the studies, results indicated that, topping (Removal of terminal leaves) 78.5 per cent , use of neem based insecticides 54 per cent, stem pasting with imidacloprid 35 per cent, use trap crop- cowpea 29 per cent and bhendi 26 per cent, use of delta traps 29 per cent and use of trichocards 10.5 per cent adopted by IPM farmers. Where as in Non IPM farmers, technology like topping 50 percent and use of neem based insecticides 17 per cent were observed. An average (three years compilation) 12 per cent yield increased in demo plot as compared to local, net return Rs. 6746 was higher as compared to local, B: C ratio in demo plot 2.15 as compared to local 1.65 and Rs.1145 /ha saved in the cost of plant protection as compared to non demo plots*

Key words*: IPM, Cost of Plant Protection, Yield and B: C ratio)*

INTRODUCTION

Cotton is an one of the important international commercial crop. After introduction of Bt cotton slowly cotton industry in booming stage. Among the cotton, long staple is much more important growing in few locations in the country. Out of, Mysore district is one of known cotton belt for long staple cotton growing yearly an area of 52,000 ha with productivity of 459 kg/ha. This low productivity is due to biotic and a biotic factors. Biotic means insect pest and diseases are cause yield losses to the extent of 15 to 20% beside, cotton is growing under rainfed condition. In Mysore district, more than 80% area comes under H.D. Kote taluk of followed by Nanjanagudu, Hunsur and Mysore.To overcome losses due to insect pest and reduce cost of plant protection cost/ ha, KVK has intervened by the implementing IPM technologies in 9 villages of H.D. Kote taluk of during 2005, 2006 and 2007 in 200 ha with 275 farmers. After introduction of IPM technologies *viz.,* growing bhendi and redgram are trap crop and cowpea as eco-feast crop to divert spotted, American and aphid population from main crop. Stem pasting with imidaclropid 20 ml/lit 35 days after sowing against sucking pest. Release of *Trichogramma chilonis* 60,000/acre at 45 and 55 DAS. Spraying of Neem based insecticide at 70 DAS.Topping at 80 DAS to reduce Helicoverpa oviposition and encourage sympodial branching. Use of delta traps 4 / acre at 90 DAS. Spraying of contact insecticide *viz.*, chlropyriphos 2 ml/lit. After successive introduction of IPM technologies in 3 years assessed impact study of each technology beside to know the whether it created job opportunities or not. The FAO-EU IPM programme for cotton in Asia (Cotton IPM programme) monitored pesticide use and also decided to test the environmental impact quotient(EIQ : Kovach et al., 1992). Over past decade many risk indicators have been developed and OECD,EU and USDA are currently evaluating different models to find the best suitable pesticide risk indicators to help government assess the impact of

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IPM and pesticide polices. (AFT, 2003; CEC, 1994; Reus *et al.*, 1999; Vercruyse, 2002).

METHODOLOGY

More than 80% cotton area comes under H.D.Kote taluk of Mysore district. Hence, we have given preference to this taluk and MYRADA has selected as NGO for supporting this programme. Jointly selected 9 villages in H.D.Kote taluk. During 2005, we have implemented IPM technologies in 50 ha (50-SC:8, ST:16, Women : 12 and Others : 14)in Nerale village in H.D.Kote taluk. During 2006, implemented IPM technologies in 50 ha in 125 farmers field (125:SC:10, ST:19, Women : 24 and others : 72) in 4 villages of H.D.Kote taluk. During 2007, implemented IPM technologies in 100ha (100: SC:8, ST: 16, Women :20 and others : 56).Overall implemented IPM technologies in 200 ha in 275 farmers field (275: SC:26, ST: 51, Women : 56 and others : 142).After successive introduction of IPM technologies in 3 years in different location of H.D. Kote taluk. In 2008-09 , impact study was conducted by following roving survey by selecting IPM and Non-IPM farmers in each villages of H, D, Kote taluk based on assessed which technology performing better, how much % adopting IPM technologies and what is the horizontal spread.

RESULT AND DISCUSSION

IPM programme implemented in 200ha in the 275 farmers field in 9 villages of H.D.Kote taluk of Mysore district during 2005, 2006 and 2007. Totally, 9 IPM technologies were implemented *viz.*, growing bhendi and redgram are trap crops and cowpea as eco-feast crop to divert spotted, American and aphid population from main crop. Stem pasting with imidaclropid 20 ml/lit 35 days after sowing against sucking pest. Release of *Trichogramma chilonis* 60000/ acre at 45 and 55 DAS. Spraying of Neem based insecticide at 70 DAS.Topping at 80 DAS to reduce Helicoverpa oviposition and encourage sympodial branching. Use of delta traps 4 / acre at 90 DAS. Spraying of contact insecticide viz., chlropyriphos 2 ml/lit. Among IPM technologies survey clearly indicated that low/ no cost technology "Topping" (removal of terminal leaf) clearly indicated that 78% adoption means 216 farmers implemented over 275. Beside it was horizontally spread 50.40 with in or nearby villages. (Table 1) Followed use of neem based insecticide /neem seed kernel extract clearly shown that 54% adoption means 149 farmers over 275. Beside it was horizontal spread to 36%(181 out of 500).

This success mainly neem seeds locally available at cheaper rate. (Table 2) Followed by stem pasting with imidaclropid 20 ml/lit of water in order to manage sucking pest. (Table 3) Generally to overcome sucking pest use of Dimethoate 2 ml /lit of spray is the common in this area but it kills other than target pest beside it costly. To overcome this problem we advised use of stem pasting technology it will not only protect aphid also manage stem borer but cheaper and easier. Followed by use of trap crop –as redgram 39% adoption means 108 farmers adopted out of 275.and horizontal spread was 33.6%. This is most common practice usually practising but not clarify what for it use after given clear cut reasons still strengthened their believe. Followed use of cowpea as eco-feast crop adopted 29.4% means 81 out of 275and horizontal spread was 12.30%. Use of delta traps against pink

Table 1
Horizontal Impact Study of IPM Technology *viz.*, Topping in Long Staple Cotton in H. D. Kote Taluk of Mysore District in Karnataka

Years	*Technology implemented*	*Total area allotted and implemented (ha)*	*Villages covered*	*No. of beneficiaries*	*Total No. of IPM farmers continued technology*	*% adoption*	*Non-IPM farmers adopted IPM technology (*500 farmers surveyed in 9 villages) Horizontal spread*
2005-06 2006-07 2007-08	Topping (Removal of terminal leaf)	200	Nerale Bidarahalli Katawala Matakeri Nandinathpura Lanke Jakkahalli K. G. Halli Hosaholalu	275	216	78.5	252 (50.4%)

Table 2
Horizontal Impact Study of IPM Technology *viz.*, Use of Neem Seed Kernel Extract in Long Staple Cotton in H. D. Kote Taluk of Mysore District in Karnataka

Years	*Technology implemented*	*Total area allotted and implemented (ha)*	*Villages covered*	*No. of beneficiaries*	*Total No. of IPM farmers continued technology*	*% adoption*	*Non-IPM farmers adopted IPM technology (*500 farmers surveyed in 9 villages) Farmer to Farmer*
2005-06 2006-07 2007-08	Use of neem based insecticides / neem seed kernel extract	200	Nerale Bidarahalli Katawala Matakeri Nandinathpura Lanke Jakkahalli K. G. Halli Hosaholalu	275	149	54	181 (36.20%)

Table 3
Horizontal Impact Study of IPM Technology *viz.*, Stem Pasting with Imidacloprid in Long Staple Cotton in H.D. Kote Taluk of Mysore District in Karnataka

Years	*Technology implemented*	*Total area allotted and implemented (ha)*	*Villages covered*	*No. of beneficiaries*	*Total No. of IPM farmers continued technology*	*% adoption*	*Non-IPM farmers adopted IPM technology (*500 farmers surveyed in 9 villages) Horizontal spread*
2005-06 2006-07 2007-08	Stem pasting with Imidacloprid 20 ml /lit of water	200	Nerale Bidarahalli Katawala Matakeri Nandinathpura Lanke Jakkahalli K. G. Halli Hosaholalu	275	98	35.60	88 (17.6)

bollworm is a major pest in Bt cotton usually noticing in 110 DAS. But this technology was adopted only 29% (82 out of 275) and horizontal spread was 17%. This low adoption mainly because of non easily availability of delta traps in commercially and in time. Similarly use of *Trichogramma chilonis* not easily accepted by the farmers mainly because non available commercially and not available in time. After introduction of IPM technologies in three successive years. The increased yield level from 950 kg to 1150 kg. Beside cost of plant protection / ha of Rs.1145/ ha was saved. B:C ratio of IPM plot was 2.15: 1 and Non IPM plot was 1.65 : 1.

CONCLUSION

Overall increased yield level from 950 kg to 1150 kg due to implementation of IPM in 2005, 2006 and 2007. The cost of pp was reduced from Rs.3393 to Rs. 2248 there by saved Rs1145. Among the IPM technologies, low / no cost technology " topping" 78.5 adopted in the field condition as compared to other IPM technologies. After introduction of IPM technologies reduced pesticide utilization from 80% to 20% and bio-pesticide utilization from 20% to 70%.Among IPM beneficiaries, 4 rural youths and 2 farm women have been selected were techno- agents as well as team leader of FFS on cotton conducted by Dept of Agri. H.D. Kote and their earning Rs.3000/ month.

RECOMMONDATION

Better to use low / no cost technology easily accepted by the farming community. Not to advice or not to use input in not commercially available / not easily

accessible. Try to use local material for the preparation of Neem seed kernel extract.

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