

## IPM in cotton under dry farming condition

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### ABSTRACT

The experiments were conducted to demonstrate the TNAU IPM technologies in cotton under dry farming condition to farmers at Regional Research Station, AruppuKottai during 2003-04 and 2004-05. The adoption of IPM reduces the pest damage as well as increase the natural enemy population and seed cotton yield in cotton. It also reduces the environmental pollution due to the less conception of pesticides. The cost benefit ratio was high (1.23) in IPM adopted plot, as compared to normal block, which registered the lowest cost benefit ratio (0.40).

**Key words :** IPM, Cotton, Jassids, Bollworm, Cost-benefit

### INTRODUCTION

Rampant misuse of insecticides in cotton production system has resulted in the virtually complete elimination of bioagents populations. It must be emphasized that reduced pesticide use has demonstrated the restoration of bioagents with yields being initially low but once natural enemy populations are restored, higher yields are obtained (Asanov *et al.*, 2001). Bio-intensive module of IPM laid emphasis on the release of bio-agents with good management practices which are prevalent or that can be adopted in particular. The whole concept of IPM relies on encouraging the build up natural enemies of pests in the cotton ecosystem. As part of the All India Coordinated Improvement Project (AICCIP), an intensive networking system between ICAR, national institutes and state agricultural universities biointensive modules of IPM have been tested. As a result, a "best – bet" IPM technique has been developed on a larger area (Surulivelu *et al.*, 1998).

### MATERIALS AND METHODS

Two season field trials were conducted in one acre plot during 2003-04 and 2004-05 with SVPR 2 cotton variety to demonstrate the IPM in cotton under dry farming condition to farmers at Regional Research Station, Tamil Nadu Agricultural University, AruppuKottai. TNAU cotton IPM module comprising the following components have been adopted for demonstration and compared with the farmer's practice.

1. Resistant variety (SVPR 2)
2. Intercropping with cowpea / sunflower / blackgram / greengram / bhendi.
3. Trap / border cropping with castor and maize / sorghum
4. Application of 250 kg of neem cake.
5. Soil test based fertilizer recommendation along with split doses of Nitrogen.
6. Mechanical collection and destruction of damaged plant parts and life stages of the insect.
7. Bird perching
8. Release of *Trichogramma chilonis* @ 5 cc / release / week (based on moth activity)
9. Release of *Chrysoperla carnea* @ 1 lakh grubs / release based on moth activity
10. Need based application of Neem oil 3 %
11. Need based spray of HaNPV @ 500 LE / ha and SINPV @ 250 LE / ha.
12. Installation of pheromone trap @ 12 / ha ; Yellow sticky trap @ 50/ha.
13. Need based use of recommended insecticides.

### RESULTS AND DISCUSSION

The observation on the incidence of leafhopper revealed that the IPM plot recorded average of 1.4 per plant, whereas in the Non-IPM block the incidence was 2.2 per plant. The incidence of

Table 1 : Pest Population and Cost Benefit ratio in Integrated Pest Management demonstration

Particulars	IPM block (ha)	Non IPM block (ha)
Cost of cultivation including summer ploughing, seeds, fertilizers, sowing, weeding and harvest	Rs. 4100	Rs. 2813
Number of insecticidal sprays	Nil	Three
Application of pesticides	Rs. 240	Rs. 2150
Pheromone traps, Bird perches, yellow pan trap	Rs. 275	-
Total Cost of cultivation	Rs. 4615	Rs. 4963
Income from cotton	Rs. 2900	Rs. 2000
Income from intercrops	Rs. 2778	-
Revenue	Rs. 5678	Rs. 2000
Net Profit	Rs. 1063	(-) Rs. 2963
Jassid population / plant	2.5 – 4.8	4.5 – 112.6
Aphid population / leaf	2.1 – 4.6	3.2 – 6.8
Predator population / plant	1.8	1.1
Bollworm incidence (%)	11 - 14	25 – 29
Stem weevil incidence (%)	15.56	25.00
Yield (Kg/ha)	145	100
Cost benefit ratio	1:1.23	1:0.40

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bollworms in cotton was less in IPM block, 11 to 14 percent damage as compared to 25 to 29 percent in Non-IPM block (Table 1). Since, no chemical spray was given in IPM block, the natural enemy population was good enough to contain the pests. The stem weevil incidence was observed in both IPM and Non-IPM blocks. The stem weevil incidence assessed based on the number of galls per plant revealed that in IPM block 15.56 percent of plants were affected by stem weevil while it was 25 percent in Non-IPM block. The observation revealed that there was neither death of plants in initial stages nor lodging of plants at boll maturation stage. The IPM block registered seed cotton yield of 145 kg / ha as against 100 kg / ha in Non-IPM block resulting in C: B ratio of 1:1.23 in IPM block and 1:0.40 in Non-IPM block. It was in accordance with Srivilliputhur IPM module which resulted in 32.4 percent yield increase over farmers practice (Krishnamurthy et al., 2003).

Trap crops viz., Castor, Sunflower and Red gram served as indicators of pest damage besides trapping sucking pests and *Helicoverpa* to an appreciable degree. The income from intercrops was Rs. 2,778 / ha which is almost equal to returns from main crop, cotton (Rs. 2900 / ha). Hence, growing of intercrops in rainfed cotton farming is mandate which compensate the crop failure due to natural calamities.

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