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Success Story on TNAU Technology Capsule against Fall Army Worm in Maize

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Abstract

Corn, (*Zea mays*), also called Indian corn or maize, cereal plant of the grass family (Poaceae) and its edible grain used as livestock feed, human food, biofuel, and raw material in industry. Maize crop is cultivated in all districts of Tamil Nadu and also in Vellore district throughout all the seasons. Due to the recent invasion of fall armyworm, (*Spodoptera frugiperda*, J. E. Smith), the farmers were panic to go for maize cultivation. With the adoption of technology capsule, the farmer has registered lowest leaf, whorl, tassel and cob damage caused due to FAW also had direct relation in reducing the larval population. Due to technology interventions viz., border and intercrops there resulted in the increased activity of natural enemies' viz., Coccinellids and spiders. The highest grain yield was recorded in the technology capsule (4200 kg/ha) with 44.8 percent increase over farmers practice (2900 Kg/ha).

Background Information

In the past couple of years, there arise few challenges towards maize cultivation due to alarming problem of an invasive insect, fall armyworm (FAW), *Spodoptera frugiperda* not only in Tamil Nadu all over India. The maize crop is cultivated in an area of about 1500 ha in Vellore district during all the three seasons' viz., Kharif, Rabi and summer. In order to increase the area expansion and production of maize, which is questionable due to the non-adoption of proper management practices to combat this insect pest. Hence to overcome the problem on technology adoption, under Tamil Nadu Irrigated Agriculture Modernization project Phase-II operated at Agarmaru sub-basin intervention on Demonstration of FAW technology capsule was carried out during Rabi season 2019-20 in the farmer field of Mr. K. Elango, Gollamanagalam village, Madhanur block, Vellore district of Tamil Nadu with an objective to reduce FAW incidence with the adoption of technology capsule.

Institutional Involvement/ Intervention

The following technology capsule formulated by Department of Agricultural Entomology, Centre for Plant Protection Studies, Tamil Nadu Agricultural University, Coimbatore was demonstrated in the farmers field with farmers practice as mentioned below (Table 1) towards the management of FAW.

Success Point/ Results

The technology capsule adopted by the farmer resulted in the reduction of FAW as compared to the farmers practice (without technology capsule). With the

Table 1: Technology Capsule Vs Farmers practice

S. No.	Technology capsule	Farmers practice
1	Deep ploughing	Normal ploughing
2	Application of neem cake (100 kg)	Not applied
3	Seed treatment with thiamethoxam 30 FS	Not treated
4	(10 g/kg of seed)	Not followed
5	Border crop: Sesamum	Not followed
6	Inter crop: Black gram	Not installed
7	Pheromone trap (5 Nos)	-
8	Spray of azadirachtin 1% 20 ml per 10 litres of water at 15-20 Days after sowing (DAS)	Spray of chlorpyrifos 30 ml / 10 litres of water with Jaggery
7	Spray of Chlorantraniliprole 18.5SC 4 ml per 10 litres of water at 45 DAS	-
8	Spray of Chlorantraniliprole 18.5SC 4 ml per 10 litres of water at 45 DAS	Spray of chlorpyrifos 30 ml / 10 litres of water with Jaggery

adoption of technology capsule, the farmer has registered the lowest leaf, whorl, tassel and cob damage caused due to FAW which also resulted in low larval population. Due to technology interventions viz., border and intercrops there resulted in the increased activity of natural enemies' viz., Coccinellids and spiders. The pheromone trap catches were taken at weekly interval and recorded 6 adult male moths / week till 40 DAS. The highest grain yield was recorded in the technology capsule (4200 kg/ha) with 44.8 percent increase over farmers practice (2900 Kg/ha) (Table 2).

Table 2: Impact of Technology capsule and farmers practice towards fall armyworm

Parameters	Technology capsule	Farmers practice
Leaf damage (%)	11.6	25.2
Whorl damage (%)	7.1	36.7
Tassel damage (%)	6.6	23.3
Cob damage (%)	6.6	26.6
Larval population (No. / plant)	0.71	1.55
Trap catches (Nos) (Mean /week)	6.0	-
Natural enemies (No./ Plant)	1.20	1.20
Harvest time damage (%)	3.3	23.3
Grain Yield (Kg/ha)	4200	2900
Benefit cost Ratio	2.30	1.20

Outcomes/ Extension Aspects

With the adoption of technology capsule, the farmer has registered lowest leaf, whorl, tassel and cob damage caused due to FAW which had positive

relationship in reducing the larval population. Also with the adoption of technology interventions viz., border and intercrops there resulted in the increased activity of natural enemies' viz., Coccinellids and spiders. The adult male catches of fall armyworm at initial stages of crop growth had a positive impact on the grain yield. The highest grain yield was recorded in the technology capsule (4200 kg/ha) with 44.8 percent increase over farmers practice (2900 Kg/ha).



Figure 1: A field view of demonstration on TNAU Technology capsule



Figure 2: Demonstration on TNAU Technology capsule

Conclusion

Technology capsule adoption in maize has brought a significant positive impact in terms of damage and population reduction of fall armyworm. Raising of border and intercrop has tremendously increased the activity

of natural enemy population in the field thereby indirectly reducing the larval population. In general and to be specific, technology capsule adoption in maize is the need of the hour to combat FAW in the upcoming years.