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Success story on management of *Maruca testulalis* and *Helicoverpa armijera* in Redgram

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Abstract
The present study revealed about the success of a 70 years old innovative farmer. In Naginonipally village, out of 575 acres cropped area, 200 acres are under Maize, 150 acres under Rice, 100 acres under Redgram and remaining cropped area is left for Sorghum and finger millet. Naginonipally is a village in Mahabubnagar district, where Redgram crop was suffered with the infestation of *Maruca testulalis* and *Helicoverpa armijera*.

Keywords: Innovative, success, infestation, management, *Maruca testulalis* and *Helicoverpa armijera*

Introduction
Naginonipally is a village in Hanwada mandal in Mahabubnagar district of Telangana State, India. It is located 15 kilo meter towards North from district head quarters Mahabubnagar. 1 KM from Hanwada with a total population of 1575 comprising 337 households. Gross cropped area is around 575 acres under which more than 200 acres are under Maize, 150 acres under Rice, 100 acres under Redgram and remaining cropped area is left for Sorghum and finger millet. 80- 90 per cent are soils are red sandly loams.

Most of the farmers raise the Redgram crop under rainfed situation during Kharif (about 100 acres). Average yields of Redgram in this village are 5-6 quintals per acre after good management practices against weeds, pest and diseases. However during the year 2018-19 the Redgram crop was suffered with the infestation of Maruca testulalis and Helicoverpa armijera in Naginonipalli village. The infestation ranged from 40 to 50 per cent in different areas in the village. Most of the farmers could not get good yields due to damage caused by Maruca testulalis and Helicoverpa armijera particular to Naginonipally village during Kharif season 2018-19

In this situation DAATT Center scientists along with Department of Agriculture officials organized awareness programs and conducted several diagnostic visits to propagate the management practices for *Maruca testulalis* and *Helicoverpa armijera* in the villages. Likewise we entered into Naginonipally village during the month of July -2019 to address the farmers on management of *Maruca testulalis* and *Helicoverpa armijera.* Mr. K. Chandraih S/o Shivaih was growing *Kharif* Redgram in 4 acres and he approached DAATT centre scientist for *Maruca testulalis* and *Helicoverpa armijera.* management advisories. Mrs. K. Chandraih of this village, however, created good yields through the adoption of management of *Maruca testulalis* and *Helicoverpa armijera.*

Technology intervention and its description
The important insect pests causes economic loss by attacking the crop at vegetative or reproductive stage are pod borer, *Helicoverpa armijera*, Legume pod borer, *Maruca testulalis*.

Pod borer, *Helicoverpa armijera*: It is an important insect pest of chick pea and it damage sometime causes >80 per cent of crop yield loss (Anonymous [2&3]). Young larvae voraciously feed the developing buds, flowers while matured larvae bore into the pods and feed the grains. Adult moths lay the spherical yellowish eggs singly on tender parts of the plants. It's life cycle completes in a period of 28-40 days. (Bhumika Kapoor *et al* [2], Rathore *et al* [7], Swamy *et al* [11] and Umbarkar *et al* [12]) [2, 7, 11, 12].

Spotted pod borer or Legume pod borer, *Maruca testulalis*: The young larvae usually attacks buds and flowers and older ones bore into maturing pods. The flowers and pods are webbed together by frass produced by the larvae (ACRIP Report) [1]. A larvae may consume 4-6 flowers before larval developmental is completed. Seeds in the damaged pods are totally or partially eaten out by the larvae. Adult female moth lays light yellow, translucent eggs in groups on flower buds and flowers (Kumar and Kumar; Naik and Mallapur; Sarkar and Roy; Soundararajan and Sreekanth) [5, 6, 8, 9].

By explaining this we convinced the farmers to take up the following action to manage the *Maruca testulalis* and *Helicoverpa armijera*.

In the month of June-2019, recommendation was given as per the guidelines given by the Professor Jayashankar Telangana State Agricultural University.

At the time of sowing of Redgram crop, suggested PRG-176, short duration variety under scarce or deficit rainfall situation

Mass trapping of male moths using Pheromone traps @15/acre up to 60 days after sowing.

During the initial stages of the crop (pre flowering stage), upon finding one egg mass per plant - removal of the egg mass and spray of Azadiractin 1500 ppm one liter per acre was suggested.

During flowering stage suggested Chloripyriphos 2.5 ml + DDVP 1 ml/liter water

During pod formation stage suggested Chlorantriniliprol 0.3ml/lit water.

During August-2019 when we visited Naginonipally village observed 40 to 50 per cent damage of crop under infestation of *Maruca testulalis* and *Helicoverpa armijera*. And but in Chandraih field, the crop was only 10 per cent under the infestation of *Maruca testulalis* and *Helicoverpa armijera.* In this situation all the farmers in the village feared and neglected the crop but Mr. K. Chandraih practiced what DAATTC Mahabubnagar advocated through group discussions and meetings. He regularly monitored the incidence or presence of *Helicoverpa armijera* through pheromone traps. He noticed 15 male moths per trap in 20 days interval.

Methodology approach

First we entered into the village through diagnostic visits along with Assistant Director of Agriculture, Mandal Agriculture Officers, AEOs and village lead farmers. Conducted group discussions and awareness programmes to farmers in the village. Among all the 10 farmers Mr. K. Chandraih practiced well the DAATT centre advisories in managing this *Maruca testulalis* and *Helicoverpa armijera.*

Fig 1: Group discussion with farmers on management of *Maruca testulalis* and *Helicoverpa armijera.*

Fig 2: *Maruca testulalis* damage in Redgram crop

Fig 3: Diagnostic field visit in Redgram crop for detection of *Maruca testulalis* and *Helicoverpa armijera.*

Fig 4: Distribution of pheromone traps, Neem oil, Chloripyriphos, DDVP and Chlorantriniliprol to the farmer

Fig 5: Observed *Helicoverpa armijera* moths in traps

Cost of technology intervention

Normal cost of cultivation spent by the farmer which includes land preparation, seed cost, fertilizer, weeding, pesticides for *Maruca testulalis* and *Helicoverpa armijera* management and harvest was Rs. 8000/- per acre. Whereas most of the farmers who are not able to manage *Maruca testulalis* and *Helicoverpa armijera* neglected their crop (50 acres) and some of the poor management farmers has lost their crop with poor yields.

Table 1: Economic details of the farmer

Farmer name	Village /mandal	Crop	Interventions by DAATTC	Yield Kg/acre	Cost of cultivation	Gross returns Rs/acre	Net returns per acre
Kosgi Chandraih	Nainonipally/ Hanwada	Redgram	PRG 176 + Spraying of Azadiractin 1500ppm 5ml/lit at pre flowering stage+Chloripyriphos 2.5 ml + DDVP 1 ml/liter water (Flowering stage)+ Chlorantriniliprol 0.3ml/lit water.(Pod Formation)	934	8000	54172	46172

Fig 6: Organizing field day in farmer field

Economic benefit due to Technology intervention:

Due to technology intervention advocated by DAATTC, Mahabubnagar he realized 9.34 quintals per acre with net profit of Rs. 46,172/-. This has made him ideal person in the village among Redgram farmers who have neglected their crop due to incidence of *Maruca testulalis* and *Helicoverpa armijera.*

Fig 7: Crop with good yield with less infestation of *Maruca testulalis* and *Helicoverpa armijera.*

Impact on livelihoods/ Socio economic condition of the farmer

His achievement in the village has given courage to fellow Redgram farmers in the management of *Maruca testulalis* and *Helicoverpa armijera.* In coming seasons. Mr. K. Chandraih, is one of the innovative farmer in the village has proven himself by fetching more profits by adopting the timely management practices for *Maruca testulalis* and *Helicoverpa armijera.* His achievement in the village has given courage to fellow Redgram farmers in the management of *Maruca testulalis* and *Helicoverpa armijera.* in coming seasons.

Feedback of the farmers: Timely action against this pest is crucial and if we manage the crop till pod formation, this pest will not cause damage after grain hardening stage of the crop.

Sustainability

Raising the crop under rainfed conditions, regular monitoring of the pest in Redgram fields, community approach and uniform sowing of the crop in the village will manage this pest successfully.

Lessons learnt

Awareness programmes will change the farmers attitude towards adoption of new technologies. The success story of Mr. K. Chandraih is the best example for his motivation in managing the pests of pod borer, *Helicoverpa armijera*, Legume pod borer, *Maruca testulali.*

Conclusion

He has achieved success with his farm due to several factors, including personal involvement, timely management practices for control of pest, good coordination with DAATT centre scientists and close supervision of pest. He is an example of a successful farmer and has proved that wonders can be done in agriculture if investments are made in the right direction and farmers are equipped with the latest knowledge. Mr. K. Chandraiah of this village, however, created a remarkable recovery in Redgram production through the adoption of management practices of *Maruca testulalis* and *Helicoverpa armijera.*

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