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## Success story on management of fall army worm in maize

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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 Maize crop was suffered with the infestation of devastating new exotic pest fall army worm.

**Keywords:** Fall army worm, exotic pest, success and maize

**Introduction**

Naginonipally is a village in Hanwada mandal in Mahabubnagar district of Telangana State, India. It is located 15 kilo meters towards North from district head quarters Mahabubnagar. 1 kilometer 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 soils are under red sandy loams.

Most of the farmers raise the Maize crop under rainfed situation during *Kharif* and the crop is raised under bore well during *Rabi* season (about 80 to 100 acres). Average yields of Maize in this village are 25 to 30 quintals per acre after good management practices against weeds, pest and diseases. However during the year 2018-19 and 2019-20 Maize crop was suffered with the infestation of devastating new exotic pest throughout the erstwhile Mahabubnagar district. The infestation ranged from 40 to 80 per cent in different Maize potential areas. Most of the farmers could not get good yields due to damage caused by fall army worm in many places of the district in particular to Naginonipally village during *Kharif* season 2019-20 (State department of agriculture)<sup>[1]</sup>.

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 fall army worm in the villages. Likewise we entered into Naginonipally village during the month of July -2019 to address the farmers on management of fall army worm.

Mr. K. Chandraiah S/o Shivai was growing *Kharif* Maize in 5 acres. In his childhood, he started developing a passion for Agriculture. His interest increased when he saw his family members get involved in all agriculture operations including weeding, fertilizer application, pesticide spraying and harvesting. When he observed fall army worm in his field, he approached DAATT centre scientist for FAW management advisories.

**Technology intervention and its description**

Fall armyworm (FAW) *Spodoptera frugiperda* (Smith, JE) (Lepidoptera: Noctuidae), native to tropical and subtropical regions of the Americas, feeds on leaves and stems of more than 80 plant species. Among these, cultivated grasses such as Maize, Rice, Sorghum and Sugarcane have been recorded as major hosts whereas several dicotyledonous vegetable crops and Cotton, besides wild grasses, have been documented as minor host. First reported from Africa in 2016 as an invasive alien pest (Goergen *et al.*)<sup>[2]</sup>, it has spread to more than 30 countries in the continent causing significant damage to maize crop with great potential for further spread and economic damage (CABI and EPPO)<sup>[3, 4]</sup>. Fall armyworm has been reported from the Indian subcontinent in mid-2018 in the form of pest alerts (ICAR-NBAIR)<sup>[5]</sup>,

factsheets and internet news reports (CABI and EPPO) [3, 4], and primarily on maize, in the states of Karnataka, Tamil Nadu, Andhra Pradesh, Telangana and Maharashtra. Fall army worm is a serious exotic pest which has infested Maize crop during last year. The adult female moth of this pest lays about 100 to 200 eggs in clusters on tender Maize leaves covered by moth scales. After hatching the first and second instar larvae feed on the leaves and cause papery windows on the leaves causing defoliation and this stage lasts for 10 to 15 days. The third, fourth and fifth instar larvae feed inside the whorls accompanied by large quantity of frass plugging the hole of the stem which causes the most damage to the Maize crop and this stage lasts for another 20 to 25 days and later last instar caterpillars drop down and complete their pupal stage in the soil which lasts for 7 to 10 days. It completes 7 to 10 generations per season. Hence fall army worm infestation can be seen throughout the seasons *Kharif* and *Rabi* and it can affect and cause damage to any stage of the maize crop. By explaining this we convinced the farmers to take up the following action to manage FAW (Goergen *et al.*) [2].

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 Maize crop, suggested inter cropping of Redgram with 4:1 ratio which will be beneficial to the farmers in scarce or deficit rainfall situation.

After sowing of the crop, suggested erection of bird perches @ 10/acre.

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

During the initial stages of the crop, upon finding one egg

mass per plant - removal of the egg mass and spray of Azadiractin 1500 pm one liter per acre was suggested.

When the larvae are in the initial instars, when crop is at 30 days- spray of Emamectin benzoate 80 grams per acre targeting maize whorl where the larva resides to feed was advocated.

When the crop is 60 days old, application of Chlorantriliprole 60 ml per acre targeting Maize whorls was suggested.

When the crop is more than 60 days and at tasseling stage- poison bait with thiodicarb and hand picking of the FAW larvae was suggested.

During August- 2019 when we visited the crop, the crop was 50-60 per cent under the infestation of fall army worm. In this situation all the farmers in the village feared and neglected the crop but Mr. K. Chandraiah practiced what DAATTC Mahabubnagar advocated through group discussions and meetings. He regularly monitored the incidence or presence of fall army worm through pheromone traps. He noticed 20 male moths per trap.

### 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. We entered into K. Chandraiah's Maize field and observed 50-60 per cent of the crop was infested with fall army worm and he had decided not to neglect the crop and wanted to follow the DAATT centre advisories in managing this devastating fall army worm.



Fig 1: Group discussion with farmers on management of FAW



Fig 2: Maize crop affected with FAW



Fig 3: Diagnostic field visit in Maize crop for detection of FAW



Fig 4: Distribution of pheromone traps and noticed male moths in the traps

#### Cost of technology intervention:

Normal cost of cultivation spent by the farmer which includes land preparation, seed cost, fertilizer, weeding, pesticides for fall army worm management and harvest was Rs. 10300/- per

acre. Whereas most of the farmers who are not able to manage the FAW have neglected their crop (100 acres) and some of the poor management farmers has lost their crop with poor yields and left for grazing.

Name of the Farmer	Input cost (Rs.)	Market rate per quintal	Yield in quintals per acre	Gross profit (Rs.) per acre	Net profit (Rs.) per acre
Kosgi Chandraih	Seed: 2300/- Labour and weeding: manual Pesticides: 2100 Fertilizer application: 4500/- Harvesting: 1400 per acre Total: Rs.10,300 per acre	Maize: 1650 per quintal  Redgram: 5000 per quintal	Maize: 20 quintals per acre  Redgram: 2 quintals per acre	43,000	32,700



Fig 5: Maize crop recovered from infestation FAW

#### Economic benefit due to Technology intervention

Due to technology intervention advocated by DAATTC, Mahabubnagar he realized 20 quintals per acre in Maize with net profit of Rs. 32,700/-. This has made him ideal person in the village among Maize farmers who have removed their crop due to incidence of FAW.

#### Impact on livelihoods/ Socio economic condition of the farmer

Mr. K. Chandraih, is one of the innovative farmer in the village has proven himself by fetching more profits from the 50 to 60 per cent Fall army worm infested field by adopting the timely management practices for Fall army worm. His achievement in the village has given courage to fellow Maize farmers in the management of fall army worm in coming seasons.

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

Managing the pest at time of tassel or cob formation stage with whorl application is time consuming and herculean task.

#### Sustainability

Raising the crop under irrigated conditions, regular monitoring of the pest in Maize 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 devastating exotic pest of Maize fall Army Worm *Spodoptera frugiperda*.

#### Conclusion

He has achieved success with his farm due to several factors, including personal involvement and close supervision of pest and he was felicitated as best farmer in Naginonipally village

by DAATTC, Mahabubnagar on 5<sup>th</sup> foundation day of Professor Jayashanker Telangana State Agriculture University. 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.

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