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Short Communication

Effect of IPM Practices for Fall Army worm Management

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INTRODUCTION

Fall Armyworm (*Spodoptera frugiperda*) is a species in the order of Lepidoptera of the family Noctuidae. Fall army worm (FAW) is exotic and invasive migratory pest. It is polyphagous in nature (Hoy, 2013). Due to its migratory performances, it has been categorized as the sporadic pest (Hardke *et al,* 2015). The name is derived from the movement larva forming the military column and form en masse, feeding crops and leaving no vegetation (Casmuz *et al,* 2012). It typically found in tropical region with annual temperature ranging from 18 to 26ºC and 500 to 700 mm annual precipitation (Early *et al,* 2018). Climatological elements like temperature and precipitation are favorable for the introduction, establishment and multiplication of this pest (GC *et al,* 2019). A voracious feeder, the adult moth are capable of flying long distances to cover 100 Km in one night alone. In its life time and a generation, an adult can fly up to 300 miles. Their migration rate is remarkably fast that some scientists speculate that its fast migration is being aided by the movement of air. The female moth can lay up to 1500 egg in a single or in multiple clusters on maize or its host plants.

In India, for the first time it was reported during May 2018 in Karnataka and the pest was identified during June , 2018 and by July 2018 it subsequently spread out widely to the other states. In Nagaland, the first outbreak was reported in May, 2019. However, the loss due to FAW has not contained till date and this year again there has been reports of FAW outbreaks in Nagaland where it is estimated that a total of 2848 ha covering 231 villages has been affected during the year 2021.Out of which Zunheboto district alone has recorded a infestation area of 160 ha covering 52 villages.

MATERIALS AND METHODS

Reports of FAW infestation was reported from farmers field in 2 village's *viz.,* Litta New and Litta Old of VK subdivision, Zunheboto in initial stage of crop growth. The farmers filed were visited by the scientist of KVK to ascertain the exact cause and extent of damages caused by FAW. Based on field visit the maize fields of both the villages were taken up by the KVK to prevent further damages by FAW. IPM (Integrated Pest Management) of FAW was suggested to be taken up by the farming community which included removal and destruction of egg masses and larvae of FAW, application of fine sand into the plant whorl of affected maize plants, placing of yellow sticky traps, light traps, application of Neem oil and chemical treatment with Emamectin Benzoate as last resort.

RESULTS AND DISCUSSION

During the initial visit at farmer's field it was found that nearly 30-40% crops were infested with FAW. The farmers were unaware of the methods to control its spread. The KVK Scientists interacted with the farmers and hold a day long training programme on methods to control FAW. The farmers were also given demonstration of different methods' to control these pests. The farmers reported a reduction of 75% in FAW infestation after 25 days

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of implementation of IPM techniques.

Farmers has reported Yellow sticky traps (1 trap /100 sqm) to be more effective in trapping the moths of the FAW which ultimately resulting in reduced no. of egg laying which is in line with the findings of Lu *et al* (2012). Application of dry sand into the whorl of effected maize plant soon after observation of FAW incidence was also very effective mechanical method to control fall armyworm infestation which is in line with the works conducted by Abate *et al* (2000)

Removing larva of fall armyworm during vegetative stage as reported by Foster, (1989) helps the plant reduces the number of insecticidal spray required during the silking period. The adult female moth of fall armyworm lays eggs in cluster underneath of leaves, this allows easy destroying of eggs manually or by natural enemies (Wightman, 2018). The application of Neem oil @10 ml/l of water at 10 days interval also proved to effective for larval mortality as suggested by Tavares *et al* (2010).

Light trap is used to determine seasonal pattern of insect pest fluctuations in the all major crops, vegetables and orchards. It is very effective tool for the monitoring and controlling of both sexes insect pests which reduces the pest pressure on crop. It provides information related to insect distribution, abundance, flight patterns and exact time for insect management (Singh and Bambawale, 2012). Once the insect population in the light traps crosses a certain limit, the farmers can decide on the type of management strategy. Light traps are expensive but very efficient for collection of insects (Liu *et al,* 2007).

Insects attracted through light traps mainly belong to order Lepidoptera, Hemiptra and Coleoptera. Dadmal and Khadakkar (2014) find similar results that revealed light traps had rich populations of Coleoptera (35.10-41.81 %) followed by Hemiptera (16.86-21.77 %) and Lepidoptera (12.89-12.96 %) during two years of investigations. Ramamurthy *et al* (2010) also reported similar results. The farmers also reported reduction on FAW after the use of Emamectin Benzoate which has been recommended by IRAC, (2020) and Deshmukh *et al* (2020).

The results of IPM methods showed that the FAW can be controlled easily and the losses occurring due to FAW can be prevented by early intervention. It is worth mentioning that the farmers need to be sensitized in FAW infected areas to take preventive measures before hand to reduce economic loss in Maize production. In case of severe outbreak the recommendation would be destruction of crops and take up alternative crop/ resowing to avoid economic losses.

CONCLUSION

Fall armyworm is an important pest of maize and has recently been introduced in Nagaland due to favourable climatic conditions. FAW has become a pest of major economic importance causing up to 100% yield reduction as warned by FAO. IPM plays an important role in controlling this disease. However, efforts should be made to create awareness among the maize farming communities to take preventive measure and adopt proper IPM measures so to ensure that it does not affect their crops.

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