



Management of Sorghum Shoot Fly

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The sorghum is major cereal crop of the semi-arid tropics which adopt well to low input and low moisture situations but shoot fly (*Atherigona soccata*) is a major insect pest of sorghum may cause total losses up to 60%. The shoot fly larvae cuts the growing tips which results in 'dead hearts' formation in seedlings as well as in tillers of old plants, resulting in considerable damage to the crop. The identification of its occurrence, symptoms, nature of damage and implementation management practices will help minimize losses from shoot fly.

Introduction

Sorghum (*Sorghum bicolor* (L.) Moench) is an important food and fodder crop in world, which ranks fourth among the major cereals after wheat, rice and maize. Insect pests can be a major limiting factor in grain production and productivity of sorghum crop. More than 150 insect pest species have been reported as pests on this crop. Among these different insect pests, the sorghum shootfly (*Atherigona soccata*) is a serious pest particularly in late sown crop. The Pest attacks the crop only in early stage of growth and infestation goes up to 80%. The high yielding hybrids are more susceptible to the attack of this fly. The total loss in yield is some times as high as 60%. The pest is very serious on *kharif* and *Rabi* crops in India. Looking at the seriousness of the pest, an attempt has been made to gather the information on its management in farmer's point of view. Thus, farmers must be prepared to prevent injury from insect pest such as shoot fly. However, proper insect pest management strategies will minimize losses to insects such shoot fly and ensure appropriate insecticide use for sorghum production.

Marks of identification: Adult fly is dark grey, like the common house fly but much smaller in size, 6 & 4 dark spots on abdominal segments of female & male respectively (arranged in rows of two). Maggots are legless, tapering towards head, pale yellow, small (10- 12 mm in length). The flies are active during morning and evening hours. Females lay 25 to 40 eggs on leaf sheath. The total life cycle is completed in 18-25 days.



Adult of sorghum shoot fly

Seasonal occurrence: The insect attacks the seedlings and late sown crops are attacked badly. The attack is severe during July to October. Cloudy weather favors multiplication of the insect. In *Rabi*, early sown crop suffers more and hence sowing should be delayed possible.

Symptoms and nature of damage: Maggots on hatching from the eggs bore into the central shoots of seedlings and kill the growing point, producing 'dead hearts'. They feed on the decaying core of the shoots. Subsequently on death of central shoot, plant gives out tillers and plant gets bushy appearance. Tiny plants are particularly susceptible to the fly's infestation. Withering of central leaves, production of 'dead hearts' and side tillers are typical symptoms of shoot fly attack.

Economic Threshold Level (ETL): One egg per plant in 10% of the plant population in first two weeks of sowing or 10% 'dead hearts'.



Dead heart symptom

Management Practices for Sorghum Shoot Fly

- 1) **Crop rotation:** Crop rotation will help minimize the buildup of sorghum pests in the same field.
- 2) **Clean cultivation:** This practice helps reduce the incidence of damage from insects, which may establish infestations on weeds, volunteer crops and grasses *viz.* *Andropogon sorghum*, *Cynodon dactylon* and *Panicum spp.* Removal and destruction of affected shoots along with the larvae.
- 3) **Early sowing:** Sow the crop as early as possible i.e. immediately after the onset of rains or within 15 days after receiving of rains for kharif sorghum.
- 4) Use increased seed rate upto 12.5 kg/ha and remove shoot fly damaged seedlings at the time of thinning.
- 5) Set up hanging type plastic fishmeal trap @ 5 Nos/acre (12 Nos/ha) till the crop is 30 day old to attract and kill the adult flies.
- 6) **Biological control:** Encourage natural enemies like eulophid (*Tetrastichus nyemitawus*) and chalcid wasp (*Callitula bipartius*) which are larval parasites of this fly.
- 7) **Chemical control:** Use the seeds treated with carbofuran 50 SP @ 5% a.i. by wt. of seed (Gum Arabica sticker) or carbosulfan 25 STD @ 200 gm / kg of seed OR 3% carbofuran granules @ 5 kg /50 kg of seed by using slurry of wheat flour as sticker. OR Application of phorate 10 gm @ 10 Kg / ha in soil at sowing OR Spray the crop with 0.05% endosulfan soon as 10% seedlings are infested or 1 egg / 10seedlings are noticed OR Spraying of 4 % Neem extract or 35 % EC quinolphos 300 ml in 200 liter of water after 7 days of emergence. It is very important to have alterations of insecticides that too with different modes of action to prevent insecticide resistance (Gill & Garg 2014).
- 8) **Selection of hybrids/varieties:** Use resistant or tolerant hybrids/varieties like M-35-1 (Maldandi), SPV-462, CSV-23, CSV-13, CSV-15, CSV 5, CSV 6, CSV 7R, Swati (SPV 504), CSV-8R and Pusa Chari hybrid 106 (PCH 106), for planting. Farmers will select shoot fly resistant/tolerant varieties or hybrids which are recommended for their regional climatic conditions.



Eulophid wasp

Chalcid Wasp

Conclusion

The sorghum shoot fly incidence can be kept under check or control by proper identification of pest on field and use of management practice. The losses in yield of sorghum crop will be minimized by use of suitable insecticide before economic threshold level.

References

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