



Integrated Pest Management of Sorghum Shoot Fly (*Atherigona soccata* Rondani)

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Abstract

The sorghum shoot fly (*Atherigona soccata* Rondani) is a major pest of the jwar or sorghum crop, causing yield loss up to 90 %. It poses a significant threat to sorghum production worldwide. In this article, we will explore the crop pest scenario related to the sorghum shoot fly, including its distribution, life cycle, nature of damage, and integrated pest management strategies.

Keywords: Integrated pest management, Nature of damage, Sorghum shoot fly, Yield loss

Introduction

Sorghum (*Sorghum bicolor*) is an important cereal crop in Africa and Mediterranean Europe, as well as a staple food and fodder crop in India. It is grown worldwide and ranks as the fourth most important crop in India after rice, wheat, and maize. Insect pests pose a significant threat to sorghum production, causing yield losses of up to 90 percent in some cases. The estimated annual losses due to insect damage in the semi-arid tropics are over US\$ 1000 million. Among the insect pests affecting sorghum, the shoot fly (*Atherigona soccata* Rondani) and stem borers (*Chilo partellus*, *Busseola fusca*, *Eldana saccharina*, and *Diatraea spp*) are particularly important in many sorghum-growing areas. In India, the shoot fly, *Atherigona soccata*, is considered the most severe pest, particularly in Rajasthan, where it causes significant damage to seedlings by killing the central shoot. Infestation at the boot stage can result in the twisting of top leaves and the prevention of panicle emergence, leading to yield losses of up to 41 percent. To manage these pests, various strategies are employed, including the use of botanicals in organic production systems. Botanicals refer to plant-derived substances with pesticide properties. They can act as natural insecticides or repellents and may offer effective and environmentally friendly alternatives to synthetic chemical pesticides (Karabhantanal *et al.*, 2018). The use of botanicals for pest management in sorghum cultivation can play a vital role in organic production practices. It's important to note that specific management practices for insect pests may vary depending on the region, local conditions, and pest populations. Farmers and agricultural experts in sorghum-growing areas often employ integrated pest management (IPM) approaches that combine multiple strategies, including cultural practices, resistant varieties, biological control, and judicious use of pesticides or botanicals when necessary. Overall, the effective management of insect pests in sorghum cultivation is crucial to minimize yield losses and ensure food security for the regions where sorghum is a vital crop.

Crop Pest Scenario: The sorghum shoot fly is a significant pest that affects the jwar crop. It is a serious concern for farmers due to its potential to cause substantial yield losses. The pest has the ability to infest the crop at different growth stages, leading to direct damage and yield reduction.

Area of distribution: The sorghum shoot fly is distributed in various sorghum-growing regions globally. It is prevalent in tropical and subtropical areas, where sorghum cultivation is common. The pest's distribution is influenced by factors such as climate, host availability, and suitable environmental conditions for its development.

Life Cycle: The sorghum shoot fly undergoes a complete metamorphosis, consisting of four stages: egg, larva, pupa, and adult. The adult flies lay eggs on the lower surface of the sorghum leaves. After hatching, the larvae bore into the shoots and feed on the growing tissue. The larvae pupate within the infested shoots, and adult flies emerge from the pupae to continue the life cycle.

Nature of Damage: The sorghum shoot fly causes damage by infesting the young shoots of the sorghum plant. The larvae bore into the central shoot, resulting in dead hearts and stunted growth. This damage prevents the formation of productive tillers, leading to reduced grain formation and yield loss. Infested plants may exhibit wilting, withered leaves, and overall weakened growth.

Integrated Pest Management

Integrated Pest Management (IPM) strategies are essential for effective control of the sorghum shoot fly. Some key components of IPM include:

Cultural Practices: Crop rotation, intercropping, and planting early-maturing sorghum varieties can help reduce pest pressure.

Resistant Varieties: Planting resistant or tolerant sorghum varieties can provide some level of protection against the shoot fly.

Biological Control: Encouraging natural enemies of the pest, such as parasitic wasps and predatory insects, can help control sorghum shoot fly populations.

Chemical Control: Judicious use of insecticides, based on monitoring and threshold levels, can be employed when necessary (Jotwani, 1981). This approach should be combined with other IPM strategies to minimize chemical inputs. Seed Treatment with thiamethoxam 30 FS at a rate of 5 ml per kilogram of seed. Then after spray application of cypermethrin 10 EC at a rate of 0.5 ml per liter of water on standing scrop.

Conclusion

The sorghum shoot fly is a significant pest that poses a threat to sorghum production. Understanding its distribution, life cycle, and nature of damage is crucial for developing effective management strategies. Integrated Pest Management, incorporating cultural practices, resistant varieties, biological control, and targeted insecticide use, offers a comprehensive approach to minimize the impact of the sorghum shoot fly and safeguard crop yields.

References

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