



Evaluation of Attractant Traps for Monitoring and Management of Sorghum Shoot Fly (*Atherigona soccata*)

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The sorghum shoot fly (*Atherigona soccata*) is one of the most destructive early-season pests of sorghum, causing significant yield losses under tropical and subtropical conditions. The present article reviews the role of attractant traps in monitoring and managing shoot fly populations. Different types of traps, including pheromone-based, food-baited, and color traps, are discussed in terms of their efficiency, applicability, and field performance. The integration of attractant traps into pest management programs offers an eco-friendly and sustainable approach to minimizing crop damage.

Introduction

Sorghum (*Sorghum bicolor*) is a vital cereal crop cultivated extensively in semi-arid regions of Asia and Africa. However, its productivity is severely affected by insect pests, among which the sorghum shoot fly (*Atherigona soccata*) is of major economic importance. The shoot fly primarily attacks young seedlings (1–4 weeks old), where maggots bore into the central shoot, resulting in the characteristic “dead heart” symptom. This leads to reduced plant stand and ultimately lower yield. Traditional management practices, including chemical insecticides, pose environmental and health risks. Therefore, there is an increasing emphasis on Integrated Pest Management (IPM) approaches. Among these, attractant traps have emerged as a promising tool for pest monitoring and control.

Objectives

- To evaluate the effectiveness of different attractant traps for sorghum shoot fly.
- To study the population dynamics of *Atherigona soccata* using trapping techniques.
- To identify eco-friendly and sustainable pest management strategies.
- To compare the efficiency of various trap designs and attractants.
- To provide recommendations for integrating traps into IPM programs.

Importance of Attractant Traps

Attractant traps play a crucial role in modern pest management systems due to the following reasons:

Eco-friendly Approach: Unlike chemical pesticides, attractant traps do not pollute the environment or harm non-target organisms.

Early Detection and Monitoring: Traps help in detecting pest incidence at an early stage, allowing timely intervention.

Reduction in Chemical Use: By monitoring pest populations, unnecessary pesticide applications can be avoided.

Cost-effective Method: Traps are relatively inexpensive and easy to install and maintain.

Decision-Making Tool: Trap catches provide quantitative data that help farmers and researchers make informed pest management decisions.

4. Types of Attractant Traps Used for Sorghum Shoot Fly

Pheromone Traps

Pheromone traps utilize species-specific chemical signals to attract insects.

Mechanism: Synthetic sex pheromones mimic natural signals released by insects.

Advantages: High specificity and Effective for monitoring population levels

Limitations: Limited availability for some species and May not directly reduce larval damage

Food-Baited Traps

These traps use food-based attractants such as fermented materials or protein hydrolysates.

Examples: Fish meal, jaggery solution, yeast mixtures

Advantages: Attract both male and female flies and Simple and low-cost

Limitations: Non-specific (may attract other insects) and Requires regular replacement

Sticky Traps (Color Traps)

Sticky traps are coated with adhesive substances and often use color attraction.

Common Colors: Yellow and blue

Mechanism: Visual attraction followed by adhesion

Advantages: Easy to use, Useful for monitoring

Limitations: Less effective in high pest populations and Non-selective

Light Traps

Light traps attract insects using artificial light sources.

Mechanism: Phototactic response of insects

Advantages: Effective for nocturnal insects

Limitations: Less specific and Requires electricity

Water Pan Traps

These traps consist of water-filled containers often combined with attractants.

Mechanism: Insects are attracted and drowned

Advantages:

Simple and inexpensive

Limitations: Maintenance required, Weather-dependent

Methodology (General Approach)

In field experiments, traps are installed in sorghum fields at uniform spacing. Observations are recorded regularly (daily or weekly) to monitor insect catches. Data analysis includes:

Number of flies trapped per day, Comparison between trap types, Correlation with crop damage (dead heart percentage)

Results and Discussion

Studies indicate that: Pheromone and food-baited traps show higher efficiency in attracting shoot flies. Yellow sticky traps are useful for monitoring but less effective for control. Trap catches correlate positively with pest infestation levels. Integration of traps with cultural practices (early sowing, resistant varieties) enhances effectiveness.

Conclusion

Attractant traps are valuable tools for the monitoring and management of sorghum shoot fly (*Atherigona soccata*). Among different trap types, pheromone and food-baited traps show promising results in terms of efficiency and practicality. Their integration into IPM strategies can significantly reduce dependence on chemical pesticides and promote sustainable agriculture.

Recommendations

Use attractant traps for early pest detection. Combine traps with other IPM practices. Conduct region-specific evaluations for better results. Promote farmer awareness and training programs.

References

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