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Specialized Pheromone and Lure Application Technology (SPLAT): A Novel Pest Management Technique

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Specialized Pheromone and Lure Application Technology (SPLAT) is a promising innovation in the field of pest management. SPLAT represents a formulation designed for the controlled release of pheromones and lures, primarily used to monitor and control insect pests in agricultural settings by inhibiting mating, attracting and killing the target insect, and repelling it to reduce reproduction. This technology can be used to disrupt mating due to the prolonged release of pheromones over a time period of two weeks to six months (Kumar *et al.*, 2023). It is an effective Integrated Pest Management (IPM) tool that can be used to manage several pests in different insect orders *viz.*, Lepidoptera, Coleoptera, and Diptera. SPLAT's role in disrupting pest mating patterns aligns with the biological control aspect of IPM. By specifically targeting the reproductive phase of the pest life cycle, SPLAT enhances the effectiveness of other IPM strategies. This integration allows for a more nuanced and adaptive approach to pest management, where SPLAT serves as a key component in a diversified and sustainable toolkit.

At its core, SPLAT represents a sophisticated formulation designed for the controlled and precise release of pheromones and lures. Pheromones are chemical compounds emitted by insects to communicate with each other, often playing a pivotal role in mating behaviors. SPLAT leverages this natural communication system by strategically delivering synthetic pheromones, disrupting pest mating patterns and mitigating their impact on crops. The technology behind SPLAT involves the creation of a matrix or substrate that encapsulates the active ingredients, providing a controlled and sustained release over an extended period. This ensures that the pheromones remain effective in attracting and confusing pests, offering a targeted and efficient solution to pest management.

The SPLAT formulation can be applied in numerous ways. Applying SPLAT® requires a broad range of hand and mechanical applicators. A stick, spatula, or knife can be used as the most basic SPLAT® applicator. Syringes, grease guns, and caulking guns are examples of more sophisticated manual applicators. Many substances, such as sex pheromones, kairomones, attractants, repellents, phagostimulants, and insecticides, can be released by using SPLAT® formulations. A number of SPLAT® products are designed to function as mating disruption, attract and kill, and as repellent (Kumar *et al.*, 2023).

In the Bt cotton ecosystem, Shrinivas *et al.* (2019) investigated the dissipation of pheromone from dispensers of SPLAT-PBW formulation used against pink bollworm, *Pectinophora gossypiella* (Saunders, 1844) and they found that SPLAT-PBW has long-lasting, rain-fast, easy-to-apply, and cost-effective properties. They also found that by the end of the fifth week, 40.36 percent of the active ingredient pink bollworm pheromone was still present in the sample, which unmistakably demonstrates SPLAT-PBW's slow release.

Advantages of SPLAT

SPLAT formulation has numerous advantages over traditional dispensing technologies:

- SPLAT provides complete seasonal protection as it remains effective in managing pest up to six months.
- Various approaches can be adopted with SPLAT technology based on a wide range of application techniques (e.g., applicator sprays, aerial applicator sprays, caulking gun type tubes, etc.).
- Easily adaptable for small-scale applications to large-scale applications.
- This technology provides rain fast application, i.e., it will not wash off from vegetation.
- Versatility in application across crops and pest species: A notable strength of SPLAT lies in its versatility, making it applicable across a wide range of crops and pest species. The ability to customize SPLAT formulations for different pests enhances its adaptability to diverse agricultural landscapes.
- SPLAT can be combined with feeding stimulants and kairomones for greater effectiveness.

Conclusion

SPLAT represents a paradigm shift in pest management, offering a targeted, sustainable, and technologically advanced solution to the challenges posed by insect pests. It's precision in application, long-lasting effect, integration with IPM, versatility across crops and pest species, and commitment to environmental considerations position SPLAT as a cornerstone in the evolving landscape of modern agriculture. SPLAT's ability to disrupt pest mating patterns without the extensive use of traditional pesticides not only addresses immediate pest management needs but also aligns with the broader goals of sustainable agriculture. As SPLAT continues to evolve through ongoing research and development, it holds the promise of contributing significantly to a more resilient, environmentally friendly, and effective approach to pest management in the years to come.

References

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