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Special Issue Reprint

The Biology, Ecology, and Management of Plant Pests

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This Special Issue, "Biology, Ecology, and Management of Plant Pests," presents nine contributions (eight articles and one editorial) showcasing cutting-edge advances across three integrated dimensions. Biology covers the molecular basis of chemosensory systems—such as odorant receptors and binding proteins in the soybean pod borer—and the physiological toxicity and molecular response mechanisms of plant essential oils against stored-grain pests like the maize weevil. Ecology explores multi-trophic interactions and environmental adaptation, including the thermal plasticity of parasitoid wasps, plant pollinator volatile signaling in blueberries, microbiome dynamics of scale insects under varying infestation levels, and microbe-mediated kairomone systems where gut bacteria-derived ethyl palmitate in noctuid larval frass attracts parasitoids. Management focuses on practical tools and strategies, spanning species-specific molecular diagnostics for pest thrips identification using COI-PCR assays, and the comprehensive environmental risk assessment of RNAi-based transgenic cotton on non-target predators like lady beetles through multi-pathway exposure and transcriptome analysis. Collectively, these studies advance interdisciplinary, sustainable pest management frameworks.

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