Macadamia Integrated Pest Management

IPM of Insects and Mites Attacking Macadamia Nuts in Hawaii

by Vincent P. Jones

Part 1. Introduction to macadamia pest management
Insect growth and development; Types of insect damage
How insects become pests; Integrated pest management
Economic thresholds, economic injury levels;
Natural control vs. biological control; Natural enemies
Biological control: Types, Success rates for classical biological control, Environmental concerns;
Monitoring programs: Importance, Definitions, Design of monitoring and methods, Types of samples, Data recording;
Insecticide and miticide application: Orchard handguns, Backpack mist blowers, Air-blast sprayers, Aerial application, Inspection and calibration, Spray solution pH, Hazard to bees
Pesticide regulations

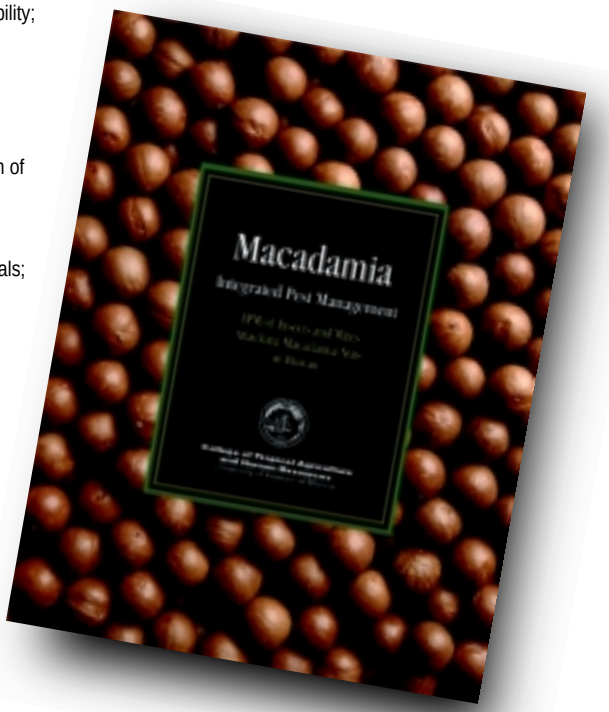
Part 2. Horticultural factors important in integrated pest management
Flowering and fruiting patterns; Nut maturation process
Normal harvest operations; Modified harvest operations
Cultivar susceptibility; Fertilizer; Pruning; Pollination
Alternate hostes, ground covers; Management of pests in nurseries

Part 3. Major pest insects
Overview of pest status
Patterns of damage
Tropical nut borer
History; Life cycle and description; Identification; Alternate hosts; Damage; Time of damage; Monitoring; Cultivar susceptibility
Sticktight nuts; Management strategies: General, Harvest modification, Early season, harvest, Mechanical harvest, Use of ethephon, Natural enemies, Use of pesticides
New orchard management; Economics of pest control
General trends
Southern green stinkbug
History; Life cycle and description; Life history in macadamia orchards; Alternate hosts; Damage; Time and location of damage; Monitoring; Cultivar susceptibility; Management strategies;
Natural enemies; Chemical control
Koa seedworm, Litchi fruit moth
History; Life history; Identification;
Alternate host plants; Damage;
Monitoring: Adult sampling, Distribution of eggs and damage in the canopy, Sampling larvae and damage; Cultivar susceptibility; Management strategies; Behavior-modifying chemicals; Natural enemies; Chemical control

Part 4. Secondary pests
Broad mite, Red and black flat mite, Katydids, Redbanded thrips, Hawaiian flower thrips, Black citrus aphid

Part 5. Pests of macadamia not yet found in Hawaii
Macadamia felted coccid, Fruitspotting bug, Banana-spotting bug, Macadamia leafminer, Macadamia flower caterpillar, Macadamia twig girdler, Twospotted bug, Yellowspotted bug, False coddling moth, Macadamia nut borer, Leafcutting ants

Appendixes: Heat-driven phenology models; Sequential sampling examples; Monitoring tools; Insect classification;
Insects identified on macadamia in Hawaii
Glossary of terms
Further readings and references



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