IMPACT

LIVESTOCK **PRODUCTION IN HAWAI'I**

Simple facility design for pigs and poultry have proven to be practical to scale for 1 to 50+ animals from the standpoint of both economics and management, furthering the potential of "Natural Farming" adoption by existing, as well as, novice producers.



IPM Implementation for Animal Agriculture

"Natural Farming" incorporates a maintenance-free green waste bedding system, which eliminates the need for manure handling; as a result, labor requirements and water usage are much lower than deeplitter or concrete wash-down facilities. Monitoring at nine "Natural Farming" swine operations and 23 poultry operations in the state indicate that generation of odor and flies were well below "nuisance" levels, and waste runoff or seepage were non-existent.

In 2011, four new piggeries using



BOTTOM: Two types of poultry housing that incorporate "Natural Farming: concepts



"Natural Farming" waste management concepts from Korea were built in Hawai'i County, ranging from backyard operations with one to two sows, to a family farm raising 4 sows, with capacity for up to 10 sows, and finally to the expansion of a commercial herd of 50 sows.

Extension agent Michael DuPonte has also assisted adoption of "Natural Farming" technology to poultry production. Two more stand-alone poultry housing structures were constructed in eastern areas of Hawai'i County. 🖏





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IMPACTS

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In the past three years, since the development of a mobile, large-scale hot shower treatment facility, more than 73,000 potted plants (estimated \$3.6 million) were treated, with nearly all species tolerating hot water well, and nearly 2,400 coqui frogs (adults, juveniles, egg clutches), 165 arthropods, and numerous slugs, snails, lizards, and worms were killed and removed by the treatment, preventing potential pest interceptions by receiving ports in the US and Guam.

The four cooperating nurseries demonstrated successful integration of hot water as a guarantine treatment for potted ornamentals just prior to shipping for large-scale, commercial production systems.



Stinging nettle caterpillar



IPM for Specialty Crops

ORNAMENTAL PLANT IPM

Nurseries shipping ornamental potted plants out of Hawai'i were encouraged to use hot water for disinfestation of coqui frogs (Eleutherodactylus coqui), nettle caterpillars (Darna pallivitta), and little fire ants (Wasmannia auropunctata) as part of a systems approach to quarantine pest management. Dr Arnold Hara and his staff trained plant nursery workers and Hawai'i Department of Agriculture inspectors and staff to operate a mobile hot water shower system. Short, multi-session (2 -4 hrs) training over two to three days appeared to be the most effective for

knowledge transfer and retention. A pictorial manual was produced

to supplement

training, especially for those operators not proficient in English. Hours and extent of training were documented as assurance to both shippers and HDOA that the heat treatments were being implemented consistently for optimal efficacy against target pests.

ANNUAL UH EXTENSION IPM REPORT

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Eight HDOA inspectors and 8 individuals representing 4 East Hawai'i nurseries are currently operating the hot water shower and can provide cross-training to others at their respective facilities. \Im

little fire ants

SEMINARS FOR GROWERS

- CPS Series of Seminars for Horticultural Industry:
- "Insect Identification"
- "Controlling Spiraling Whitefly in the Landscape"
- "Systemic Insecticides, Insect Growth Regulators, and Biological Controls against Ornamental Pests in Hawai'i"
- "California and Hawai'i Quarantine Issues"
- "Biological Control, Systemic Insecticides, and Insect Growth Regulators against Landscape Pests in Hawai'i"

"Invasive Species: Impact and Control"

Insect Identification and Control: The Good and the Bad"

http://www.ctahr.hawaii.edu/haraa/grower.asp





VEGETABLE CROPS

Nineteen Master Gardeners throughout the state are trained in area-wide fruit fly suppression strategies, and are able to conduct workshops in their respective counties. Workshop participants indicate an increase in knowledge in fruit fly identification and biology, and their ability to apply suppression techniques. Commercial growers who have been practicing these techniques for several years have made adaptations to better suit their respective operations, resulting in reduced infestation rates, crop losses, and reliance on organophosphate insecticides with the use of GF-120 protein bait, and ultimately increased farm revenue.

Diamondback moth populations were very low in Maui and Hawai'i Counties through 2011, which may be an indication of the resistance management program's effectiveness, and more importantly, the commitment of vegetable growers on the majority of acres in each county to adopt the spray rotation schedule.

Ninety-two percent of participants indicated that concepts presented through demonstrations at the workshops were sufficiently compelling to consider adopting one or more techniques into their respective operations.



VEGETABLE CROP IPM

The Area-wide Fruit Fly Suppression Program, in collaboration with USDA ARS and Hawai'i Department of Agriculture, conducted 93 outreach education activities in all counties of the state, through displays at county and farm fairs, agriculture awareness days, and farmers markets, providing DVDs to home gardeners, and training Master Gardeners in fruit fly suppression.

Nearly 2,700 home gardeners and commercial growers have been provided with information on fruit flies, including identification, biology, and management strategies.

The Diamondback Moth (DBM) Management Program continues to use IRAC (Insecticide Resistance and mode of Action Classification) to schedule insectcide rotation in monthly

spray windows.

Extension agents Robin Shimabuku and Randall Hamasaki sampled and screened DBM populations for resistance using leaf disc bioassays on progeny (larvae) of collected pupae. Five educational workshops/field days were conducted in Maui County (total of 54 attendees).

Workshops were held in Kaua'i (17 attendees) and O'ahu (13 attendees) Counties for growers

to examine new spray nozzle technology with the use of a fluorescein

dye and appropriate surfactants to improve spray coverage, limit spray drift, and reduce the potential for developing pesticide resistance. 🖏



prolong the effectiveness of

insecticides in all counties.

TRAINING

cation Program (LIFE), ex-

tension agent Jari Sugano

conducted a risk manage-

ment training program for

limited resource and under

-served Filipino, Southeast

Asian, and other minority

growers in Hawai'i, and

assistance by the USDA Risk

Management Agency, 45

workshops and field days

were conducted in all coun-

ties, reaching 1,177 grow-

low-risk, environmentally sound

Red cabbage with luminous spray to monitor nozzle performance (J Sugano)

> USDA Farm Services Agency, O'ahu Conservation and Resource, Hawai'i Department of Agriculture, and Hawai'i Farm Bureau. Pro-



IPM Training to minimize high-risk practices

HIGH-RISK MANAGEMENT lems, such as crop nutrition, and pest and disease In collaboration with Local Immigrant Farmer Edu-

identification and control were the most pressing issues with which participants wanted

assistance. Spray coverage and nozzle technology and diamond- sustainability and the back moth insecticide resistance management program were

taught to crucifer growers.

Many farmers with limited English proficiency have indicated in post-workshop

evaluations that

sessions

they prefer one-These small changes have on-one or smallimproved their group that provide a operations' non-threatening environment, a economic personalized viability. pace, and a high-

among the IPM strategies

er level of confidentiality. To that end, 224 farm visits

HIGH-RISK MANAGEMENT TRAINING

High-risk areas have been identified among farmers having limited English proficiency and little or no experience in diversified agriculture; training offered through workshops and during farm site visits have mitigated potential harm to humans (worker protection, farm safety, food safety) and the environment.

Since the inception of the Local Immigrant Farmer Education (LIFE) program, approximately 6% of immigrant growers in Honolulu County, 11% of papaya growers and 28% of coffee growers in Hawai'i County (Kea'au, Ka'u) have adopted risk management recommendations and are now "mainstream" producers, defined by sound understanding of crop production, business planning, product quality, and marketing, ability to initiate contact to gather information from appropriate resources, and willingness to assist others.

Immigrant Farmer Outreach workshops were the result of a collaborative effort between University of Hawai'i extension,

were conducted through direct and referral contacts and were scheduled around workshop dates. An interpreter was used as needed and translated training materials were introduced during these sessions. Personalized, hands-on instruction was provided to address nearly all concerns during these and follow-up visits. 🖏

For more information: http://www.ctahr.hawaii.edu/ life/Site/LIFE Overview.html

HONORS

Dr Arnold Hara, IPM Coordinator University of Hawaii Extension IPM, was recognized earlier this year as the 2012 Award Recipient by the 700+ membership of the Hawaii Florists & Shippers Association and Hawaii Floriculture & Nursery Association for his work in developing non-chemical pest management for ornamentals.

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