# LIVESTOCK PRODUCTION IN HAWAI'I

"Inoculated deep litter system" incorporates a maintenancefree green waste bedding system, which eliminates pen cleaning. Manure is composted in place so waste water is not generated or discharged, significantly reducing the nega tive impacts of effluent on soil, fresh water, and shorelines.

The accessibility of incorporating IDLS components into new or existing swine or poultry production facilities through federal costsharing and the inherently low cost of maintaining these facilities step closer to food self-sufficiency.

# **IPM Implementation for Animal Agriculture**

Since the first "inoculated deep litter system" (IDLS) piggery in the United States was constructed four years ago under extension agent Michael DuPonte in Hilo, the facility design is now recommended as a best waste management practice by USDA NRCS and the Hawaii Department of Health. USDA now allows cost-sharing to aid in the construction or conversion of existing swine production facilities to incorporate IDLS components. Regulatory agencies were able to witness IDLS' ability to handle waste with no pen cleaning or discharge of waste water over 4 years. Workshops were held on Hawai'i island (August 2012) and Kaua'i (September 2012) for nearly 100 existing and prospective swine

producers to assist with creating comprehensive nutrient management plans (CNMP) that are necessary for building permits for facilities with more than 4 pigs or >600 sq ft. During the past year, 40 smallscale poultry enclosures ("Hubbell Bubbles") using a modified IDLS were constructed in Hilo. Five were built at field day demonstrations conducted by extension agent Michael DuPonte, who then monitored them for generation of nuisance flies due to waste management as well as loss of eggs and chicks to predators (mongoose, rodents, cats, dogs, hawks). To date, nuisance fly populations are in check with no losses to predators. 💋

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IPM Coordinator: Arnold H. Hara, Specialist and Entomologist e-mail: arnold@hawaii.edu University of Hawai'i at Mānoa, College of Tropical Agriculture & Human Resources (CTAHR) Dept. of Plant and Environmental Sciences (PEPS) 875 Komohana Street, Hilo, HI 96720

## **Key Personnel:**

Michael W. DuPonte, Extension Agent, Livestock Randall Hamasaki, Extension Agent, Vegetable Crops Andrew Kawabata, Assc. Extension Agent, Nursery Crops **Ruth Y Niino-DuPonte, Support Staff** Robin Shimabuku, Extension Agent, Vegetable Crops Jari Sugano, Assc. Extension Agent, Insect Management

e-mail: mduponte@hawaii.edu e-mail: rth@hawaii.edu e-mail: kawabataa@ctahr.hawaii.edu e-mail: duponte@hawaii.edu e-mail: shimabukur@ctahr.hawaii.edu e-mail: suganoj@ctahr.hawaii.edu

Program Director: Carl Evensen, Interim Associate Dean/Associate Director for Extension 3050 Maile Way, Gilmore Hall 203B, Honolulu, HI 96822; e-mail: evensen@hawaii.edu Administrative Contact: Annette Chang, Director of Administrative Services 3050 Maile Way, Gilmore Hall 203A, Honolulu, HI 96822; e-mail: changa@hawaii.edu

# IMPACTS VEGETABLE CROP

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Cooperators in the Areawide Fruit Fly Suppression Program comprise 357 commercial farm acres; many have been participants for several years and have adapted management strategies to suit their farming operations. As a result, growers have reduced infesta tion rates and crop losses significantly, thus increasing their farm revenue. Many growers have also reduced their reliance on organophosphate insecticides and adopted the use of GF-120 protein bait spray. Home gardeners indicated increased knowledge gained by extension activities in fruit fly control, with significant improvement in participants' knowledge of fruit fly species and life cycles, as well as confidence in their ability to apply suppression techniques.





# spray coverage demonstration on dracaena IPM for Vegetable Crops AREA-WIDE FRUIT FLY SUPPRESSION The

Area-wide Fruit Fly Suppression Program, under extension agent Robin Shimabuku, in collaboration with USDA ARS and Hawai'i Department of Agriculture, conducted 26 outreach education activities in all counties of the state, through displays at county and farm fairs, agriculture awareness days, and farmers markets, and distribution of educational DVDs. Over 2,500 home gardeners and commercial growers were provided with information on identification, biology, and management strategies for fruit flies. Seventeen Master Gardeners in Hilo were trained in 2013 on the fruit fly suppression program (coordinated by extension agent Andrew Kawabata) to advise home gardeners. Cooperators (17 commercial farmers and 20 home gardeners) in the statewide program were trained and received starter materials for fruit fly pest management. Crops included: apple, avocado, banana, cantaloupe, coffee, cucumber, eggplant, gourd, jaboticaba, lemon, lychee, mango, mountain apple, nectarine, orange, papaya, peach,

# ANNUAL UH EXTENSION IPM REPORT



In this issue

Vegetable Crops

Socially-Disadvantaged Farmers

Ornamentals

Livestock

pepper, persimmon, plum, pumpkin, sapote, starfruit, sour sop, squash and tomato.

DBM RESISTANCE MANAGEMENT The Diamondback Moth (DBM) Insecticide Resistance Management Program continues to use IRAC (Insecticide Resistance & mode of Action Classification) to schedule insecticide rotation in monthly spray windows. Extension agents Robin Shimabuku and Randall Hamasaki sampled and screened DBM populations in Honolulu County (July 2012) for resistance using leaf disc bioassays on progeny (larvae) of collected pupae. None of the DBM populations on Maui or Hawai`i island were tested due to low population pressures this past year. 
more

MPACT Rotating very effective insecticides with less effective ones in the state's resistance management program appears to be preventing buildup of high populaions of DBM in Maui and Hawai'l counties during the hot summer months.





# PM FOR SOCIALLY-**ISADVANTAGED** ARMERS

Through one-on-one and small group visits, UH extension agents and faculty providing translation services teamed to effectively communicate basic pesticide application knowledge in a cooperative, nonthreatening setting to new and existing stakeholders in the basil industry, building trust and establishing themselves as a trustworthy resource for worker and consumer safety awareness and to help growers retain their market share.

Based on the mean of workshop evaluation survey responses, growers indicated learning 5 to 9 new ideas with poential on-farm applica-

Through face-to-face interviews and farm visits. the top four areas of interest statewide among participants were determined to be:

- 1. suppression and management of insect and disease pests,
- 2. crop nutrition and fertilization,
- 3. marketing and adding value, and
- 4. new varieties, crops and products.



Farmers Resource Workshop J Sugano

SPRAY COVERAGE CLINICS Five educational workshops/ field days (total 54 attendees) were conducted on Maui and Hawai'i Island growers by extension agents Robin Shimabuku, Randall Hamasaki, Steven Fukuda, and Jari Sugano on diamondback moth (DBM) insecticide resistance management. In addition, two-hour workshops, "Spray Coverage Clinic", were conducted in Waianae (O`ahu), Kula (Maui), Ho`olehua (Molokai) and Waimea (Hawai`i) in August and September 2012, averaging 25 attendees per clinic. Participants were eligible to earn 2 re-certification credits for holding restricted use pesticide (RUP) permits with class content covering the basics of pesticide application, methods and equipment, nozzle specifications, and factors that affect pesticide efficacy, spray coverage, and spray rates (see cover photo). 💋

In May 2012, the Hawaii Department of Agriculture (HDOA) detected pesticides not approved for use on basil in samples of locally-grown basil from five produce distributors on O'ahu, and promptly restricted sales and distribution. Samples from 4 of 6 basil farms were positive for at least one of the unapproved pesticides. In collaboration with Local Immigrant Farmer Education Program (LIFE) and Risk Management Hawai'i (RMH), UH extension agents, Steve Fukuda, Jari Sugano and Jensen Uyeda, quickly coordinated an information-gathering session to identify grower issues that resulted in the violation (see above, Top 10 Reasons for Misuse of Pesticides). An extension strategy was devised, and in September 2012, an educational workshop covered use of pesticides, reviewed common basil pests and pesticides registered for use in Hawai'i, HDOA pesticide inspection process, and

the Hawaii Dept of Health commodity sampling program. With translation provided by UH CTAHR faculty Ming Yi Chou, Koon Hui Wang, John Hu, and Shuya Lou, the workshop also gathered ideas to continue servicing and partnering with basil farmers, and established cooperation and

4. misinformed about use or lim-

5. no pest management plan

from

ited knowledge

basil Building trust farmers to opened avenues to worker and participate in future educaconsumer safety tional activiresources, and ties. In De- retaining market cember 2012, share. spray gun and

boom calibration demos were conducted (with Chinese translation) at Waimanalo Experiment Station and Urban Garden Center (O`ahu) for growers.

During the past year, 38 extension activities were conducted by extension agent Jari Sugano and colleagues collaborating with LIFE and RMH aimed at improving farm workers'

# knowledge of good agricultural practices and food safety, and provided training for agricultural professionals, and outreach to the general public (1,000 participants). Thai, Lao and Chinese translations were provided at several state-wide activities, including a Farmer's Resource Workshop in April

6. pesticide cost too high

9. poor spray equipment

10. spraying too close to harvest

willing to take risk

8. spray coverage

date

2013 (photo above), which was attended by nearly 150 immigrant family farm operators, support agency representatives, legislators, and the general public. Coordinated by Jason

Shitanishi of USDA FSA

the "one-stop shop" event in Kahuku featured presentations and displays by HDOA, HI Department of Health, and UH CTAHR's Jari Sugano and Jim Hollyer on pesticide calibration, safe pesticide use, food safety, and land opportunities.

S

## **ORNAMENTAL IPM PRESENTATIONS**

cals Against Invasive Pests" (Hilo, Oct 2012) the Systems Approach" (Hilo, Jul 2012) lu, Apr 2013)

2012)

View presentations at: http://www.ctahr.hawaii.edu/haraa/ grower.asp

# **IPM for Ornamentals**

"Floriculture and Nursery Pest ulations and safety equipment. Control Field Day" was coordi-Displays of the most commonly nated by UH extension agent intercepted pests on exported Andrew Kawabata and conductcut flowers and potted ornaed on April 19, 2013 in Kea`au, mentals included fact sheets, HI and attended by nearly 50 best management practices for growers and shippers of potted their control, and devices and ornamentals and cut flowers technology to better identify and foliage, state inspectors, and monitor pest populations. and representatives from affili-Hawai'i nurseries shipping ated industries, and federal and ornamental potted plants out state agencies. Demonstrations of-state continued to be enincluded different systems of couraged to use hot water on hot water application, from a plants for disinfestion of coqui handheld model to an automatfrogs (Eleutherodactylus coqui), ed version of the mobile shipnettle caterpillars (Darna pallivping container unit, sprayer itta), and little fire ants calibration and applications (Wasmannia auropunctata) as with new nozzle technology, part of a systems approach to use of surfactants, and the quarantine pest management. HDOA inspectors and staff moneffects of volume on spray coverage. HDOA provided updates itor hot water treatments by to the Hawai'i Pesticide Certifinurseries in Hawai'i County. 💋 cation Program with information on new requirements for VAPAM usage and alerted growers to other pesticide reg-

commitment

- Crop Protection Services Seminar Series for the Horticultural Industry: "Efficacy of Newer Insecticides against Invasive Species in Hawaii" (Honolulu, May 2012); "New and Emerging Pests In Landscapes and Nurseries" (Honolulu, May 2012); "Newer Insecticides & Biologi-
- MIDPAC Horticultural Conference: "Quarantine Issues for HI & CA and
- Hawai'i Exporters of Cut Flowers & Foliage: "Sending Pest-Free Products to California" (Maui County - Hana & Kahului, Nov 2012; Honolu-
- Landscape Industry Council of Hawai`i Green Industry Conference: "Newer, Safer Insecticides for Use in the Landscape" (Honolulu, Oct
- Hawaii Island Landscape Association Landscape Management Conference: "New Insect Pests and Their Control) (Kamuela, Nov 2012)

## IPM FOR ORNAMENTALS

In the past year, more than 80,000 potted plants (estimated \$3.9 million) were hot water-showered, and nearly all 35 species and cultivars tolerated the heat well; 2,112 coqui frogs clutches) and numerous ants slugs, snails, lizards, and worms were killed and removed by the quarantine treatment. Use of hot water on potted ornamental plants continues to be validated as a practical, cost-effective IPM strategy available to largescale commercial growers, preventing potential pes orts in the US and

Post-activity evaluations by attendees of the field day indicated that the majority (77.3%) of growers and shippers of ornamentals are considering adopting one or more of the IPM strategies presented. Comparing responses from the same groups of stakeholders at a pest control field day three years earlier, inclination to adopt use of hot water t 3%, and adoption of practices that would encourage beneficial insects rose from 49% to 61%.

## ONORS

Dr Arnold Hara. IPM Coordinator, UH Extension IPM, received Honorable Mention for going "Above & ' with the effort he extends to the state and the industries he serves, at the first annual Hawaii Invasive Species Council Awards hled at the Hawaii State Capitol in March 2013.