Sweetpotato Production in Hawaii: Farming without the use of Chlorpyrifos

Sharon A. M. Wages
Assistant Extension Agent-Hawaii Island
Hawaii First to Ban Chloropyrifos
OPs (organophosphates)

- Organophosphates or Esters of Phosphoric Acid
  - Insecticides (ex. chloropyrifos, diazinon, phosmet, malathion)
  - Herbicides (ex. Glyphosate-organophosphate ester)
- Inhibit neuromuscular enzyme in insects (and humans and animals)
  - Nerve Agents (ex. Sarin)
  - Societal & Health concerns
- Key is proper use! Label is the law.
Chlorpyrifos

- Mostly Restricted Use, few general use products
SB3095 SD1 HD1 CD1

• Beginning 1/1/2019, requires all users of restricted use pesticides to be subject to a requirement to report on their use of restricted use pesticides to the Department of Agriculture (DOA).

• Prohibits the use of a restricted use pesticide on or within 100 feet of a school during normal school hours beginning on 1/1/2019.

• Prohibits the use of pesticides containing chlorpyrifos as an active ingredient beginning 1/1/2019; provided that the DOA shall grant any person, upon request, a temporary permit allowing the use of pesticides containing chlorpyrifos through 12/31/2022.

SB3095 SD1 HD1 CD1

• Provides for the deposit into the pesticide use revolving fund of all penalties and fines collected under the Hawaii Pesticides Law. Revises the ceiling and use of the pesticide use revolving fund.

• Requires the DOA to develop a pesticide drift monitoring study no later 7/1/2019. Appropriates general funds for the pesticide drift monitoring study, establishment of two full-time equivalent positions, and outreach and education. (CD1)

Current List of Products Registered for Sweetpotato


<table>
<thead>
<tr>
<th>EPA Reg. No.</th>
<th>Product Name</th>
<th>RUP Status</th>
<th>Discont. Status</th>
<th>Period</th>
<th>License Date</th>
<th>License No.</th>
<th>Label Link</th>
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Amended from HDOA: Search for Currently Licensed Products by Active Ingredient

***** For Informational Use Only ***** Search Options: Active Ingredient like %chlorpyrifos%, License Expire Year >= 2018

Date: 7/23/2018
Chloropyrifos use in Sweetpotato Production in Hawaii

- Ex. Lorsban Advanced
  - Restricted Use Only
    - Need to get licence
- Pests
  - 3 Target pests
    - *Conoderus* (wireworm)
    - *Sweet Potato flea beetle*
    - *Systena (flea beetle)*
- Timing
  - Application needs to be preplant
    - Must wait 125 days before harvesting SP
    - Sweetpotatoes are a 4-6 month crop
Sweetpotatoes in Hawaii

The sweetpotato, *Ipomoea batatas* Poir., is an important food crop throughout the subtropical and tropical regions of the world and is an especially important staple crop of many of the South Pacific islands.

The sweetpotato became commercially important in the Hawaiian Islands around 1849 (10). In 1953, 833 tons, having a wholesale market value of approximately $125,000, were harvested. This figure does not take into account the small backyard plantings that are so numerous throughout the Territory.

The West Indian sweetpotato weevil, *Euscepes postfasciatus* (Fairmaire), and the sweetpotato weevil *Cylas formicarius elegantulus* (Summers) are the most destructive insect pests of the sweetpotato in the Hawaiian Islands. A conservative estimate of the loss due to these insects would be 10 to 20 percent of the crop.
Sweetpotato Pests in Hawaii

- Rough Sweetpotato Weevil (*Blosyrus asellus*)
- Sweetpotato Weevil(s) (*Cylas formicarius, Euscepes postfaciatus*)
- Gulf Wireworm (*Conoderes amplicollis*) *
- Sweetpotato flea beetle (*Chaetocnema confinis*) *
- Nematodes (Meloidogyne spp. & Reniform)
- Sweetpotato Vine (Stem) Borer (*Omphisa anastomosalis*)
- Other: aphids, sweetpotato whitefly, grasshoppers, red spider mites, flea beetles (*Systena*) *, sweetpotato hornworm

* Control with Chloropyrifos
A Tale of Two Weevils: Cylas & Euscepes

*Cylas formicarius elegantulus* was first recorded in Hawaii by Blackburn and Sharp in 1885 from the islands of Maui and Oahu (5). *Euscepes postfasciatus* was recorded in the Fauna Hawaiensis as *Hyperomorpha squamosa* in 1885 (35). Subsequently, the two species have been collected on all the major islands.
Cylas formicarius elegantulus (Summers)

- First recording in Hawaii in 1885 (Maui and Oahu)
- Flies (20ft)
- Can survive 1 mos without food
Euscepes postfaciatus

- Synonym: Cryptorhynchus batatae
- Prolific
Sweetpotato Vine Borer

- *Omphisa anastomosalis*
- 50% reduced growth
- Remove alternate hosts
Rough Sweetpotato Weevil (*Blosyrus asellus*)

1. Belay 16 WSG (Clothianidin)
2. Sevin XLR Plus (Carbaryl)
3. Provado 1.6 Flowable Insecticide (Imidacloprid)
4. BotaniGard ES (*Beauveria bassiana* strain GHA)
5. Control

Best Practices

• Start with clean planting material (treat)
  • Plant cuttings deep
• Preplant treatment (ex. Belay)
• Hill rows
• Remove alternative hosts
• Monitoring (traps)
• Harvest all potatoes, sanitation is important
  • Don’t leave culls/crop residues or bury deep
• Timing (earlier harvest)
• Rotate fields not only for pest but for diseases
  • Ex. Sunn hemp (nematode control)
Questions?

• https://www.ctahr.hawaii.edu/oc/freepubs/pdf/RES-146.pdf