



Sweetpotato Production in Hawaii: Farming without the use of Chlorpyrifos

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Hawaii First to Ban Chlorpyrifos

 **Center for Food Safety**
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Popular →



Hawaii Becomes First State in the U.S. to Ban the Toxic Pesticide Chlorpyrifos

The image shows a scenic aerial view of a valley in Hawaii. The foreground is dominated by vibrant green agricultural fields, some of which are divided into smaller plots. A winding river or stream flows through the valley, bordered by lush greenery. In the background, rolling hills and mountains are visible under a sky filled with soft, white clouds. The overall atmosphere is peaceful and natural.

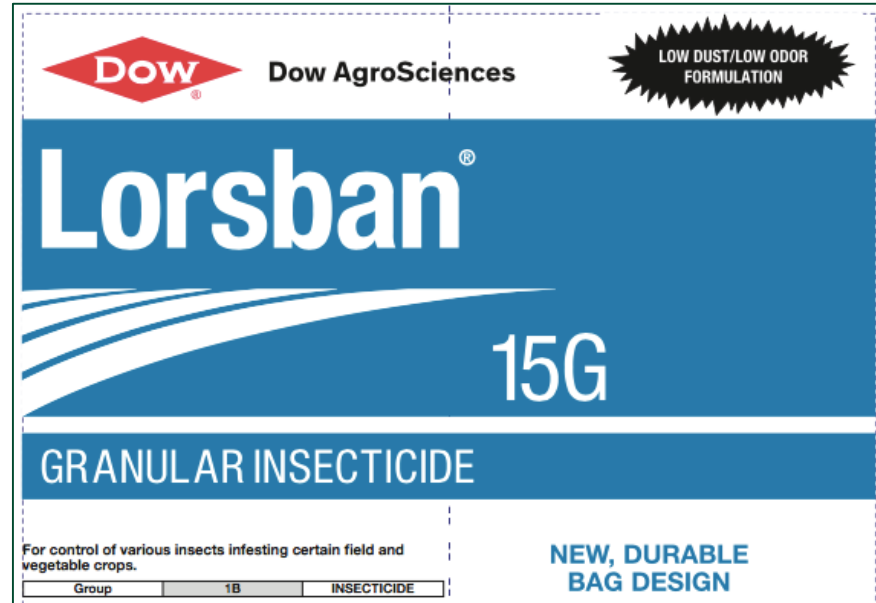
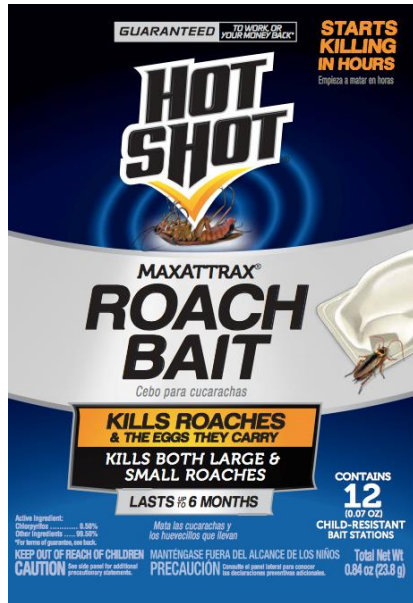


OPs (organophosphates)

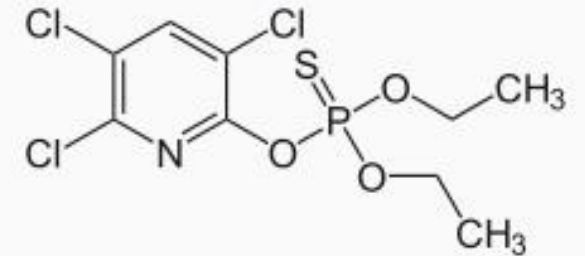
- Organophosphates or Esters of Phosphoric Acid
 - Insecticides (ex. chlorpyrifos, diazinon, phosmet, malathion)
 - Herbicides (ex. Glyphosate-organophosphate ester)
- Inhibit neuromuscular enzyme in insects (and humans and animals)
 - Nerve Agents (ex. Sarin)
 - Societal & Health concerns
- Key is proper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

Chlorpyrifos

- Mostly Restricted Use, few general use products



Chlorpyrifos



Names

IUPAC name

O,O-Diethyl O-3,5,6-trichloropyridin-2-yl phosphorothioate

Other names

Brodan, Bolton insecticide, Chlorpyrifos-ethyl, Cobalt, Detmol UA, Dowco 179, Dursban, Empire, Eradex, Hatchet, Lorsban, Nufos, Paqeant, Piridane, Scout, Stipend, Tricel, Warhawk, others^[1]



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

- <https://hdoa.hawaii.gov/pi/files/2018/07/PESTREG-Product-Chlorpyrifos.pdf>

EPA Reg. No.	Product Name	RUP Status	Discont. Status	Period	License Date	License No.	Label Link
66222-19	CHLORPYRIFOS 4E AG	Federal Restricted	N/A	2016 - 2018	01/01/2016	8275.10	http://hawaii.gov/hdoa/labels/8275.10_2018.pdf
66222-19	QUALI-PRO CHLROPYRIFOS 4E INSECTICIDE	Federal Restricted	N/A	2016 - 2018	01/01/2016	8275.37	http://hawaii.gov/hdoa/labels/8275.37_2018.pdf
34704-1077	WARHAWK CLEARFORM	Federal Restricted	N/A	2016 - 2019	12/20/2016	8378.136	http://hawaii.gov/hdoa/labels/8378.136.pdf
34704-857	WARHAWK	Federal Restricted	N/A	2016 - 2019	12/20/2016	8378.26	http://hawaii.gov/hdoa/labels/8378.26.pdf
<u>62719-34</u>	<u>Lorsban 15G</u>	<u>General Use</u>	<u>N/A</u>	<u>2016 - 2019</u>	<u>10/15/2016</u>	<u>9786.16</u>	<u>http://hawaii.gov/hdoa/labels/9786.16.pdf</u>
62719-591	LORSBAN ADVANCED	Federal Restricted	N/A	2016 - 2019	10/15/2016	9786.277	http://hawaii.gov/hdoa/labels/9786.277.pdf
<u>62719-301-10163</u>	<u>Lorsban 75 WG</u>	<u>General Use</u>	<u>N/A</u>	<u>2016 - 2019</u>	<u>10/15/2016</u>	<u>9794.30</u>	<u>http://hawaii.gov/hdoa/labels/9794.30.pdf</u>
62719-220	LORSBAN 4E	Federal Restricted	N/A	2017 - 2020	10/27/2017	9786.92	http://hawaii.gov/hdoa/labels/9786.92.pdf

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



Chlorpyrifos use in Sweetpotato Production in Hawaii

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

Sweet Potato

Worker Restricted Entry Interval: Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 24 hours unless PPE required for early entry is worn.

Apply to the soil surface as a preplant broadcast spray to reduce the feeding damage caused by listed pests. Use a spray volume of 10 gpa or more. Incorporate immediately after application to a depth of 4 to 6 inches using a rotary hoe, disc cultivator, or other suitable incorporation equipment. Plant sweet potatoes in the usual manner no more than 14 days after treatment. Delaying planting more than 14 days after application will reduce the time interval of protection against feeding damage.

Target Pests	Lorsban Advanced (pint/acre)
<i>Conoderus</i> (wireworm) sweet potato flea beetle <i>Systema</i> (flea beetle)	4

Specific Use Precaution:

- Lorsban Advanced will not control false wireworms, white fringe beetle or other grubs that attack sweet potatoes.

Specific Use Restrictions:

- **Preharvest Interval:** Do not apply within 125 days before harvest.
- Do not make more than one application of Lorsban Advanced or other product containing chlorpyrifos per season.
- Maximum single application rate is 1.88 lb ai chlorpyrifos (4 pints of Lorsban Advanced) per acre.
- Do not aerially apply this product in Mississippi.



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.

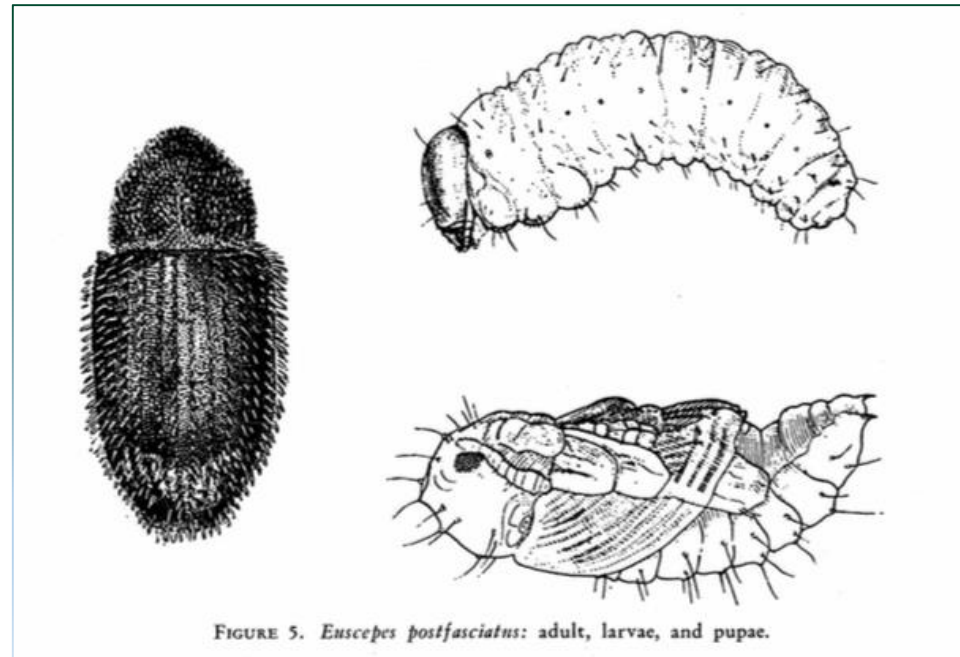
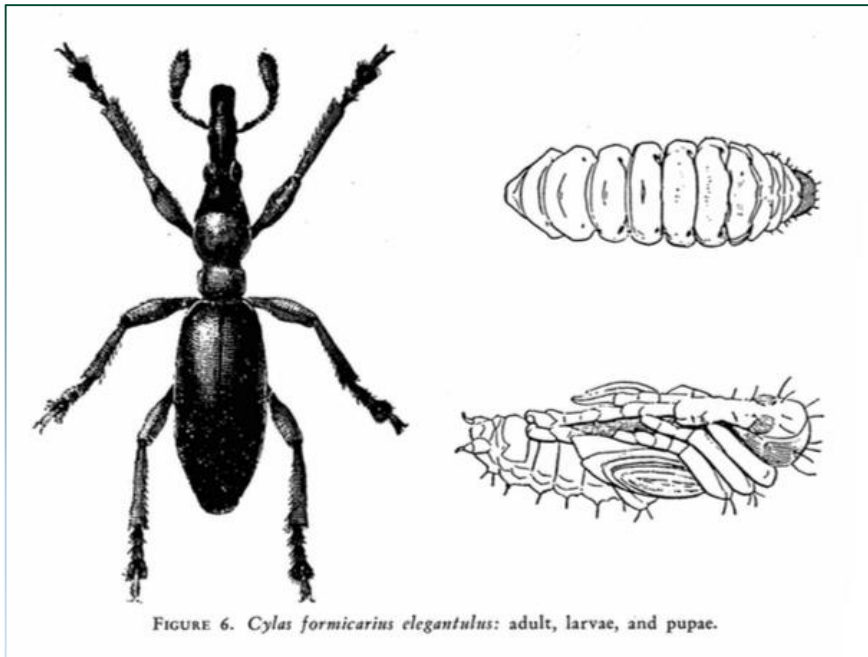


Sweetpotato Pests in Hawaii

- 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 anastomasalis*)
 - Other: aphids, sweetpotato whitefly, grasshoppers, red spider mites, flea beetles (*Systema*)*, 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 Hawaiiensis 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

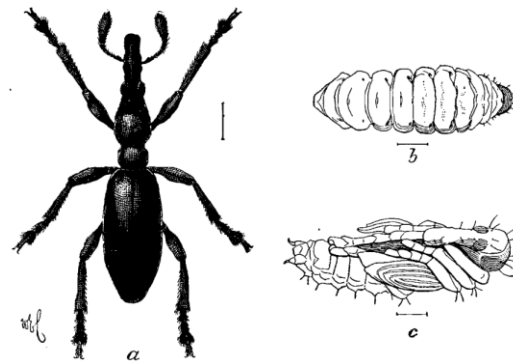


FIG. 10—Larva, pupa and adult, *Cylas formicarius* 01., a common sweet potato weevil. 7 x nat. size.



Euscepes postfaciatus

- Synonym: *Cryptorhynchus batatae*
- Prolific

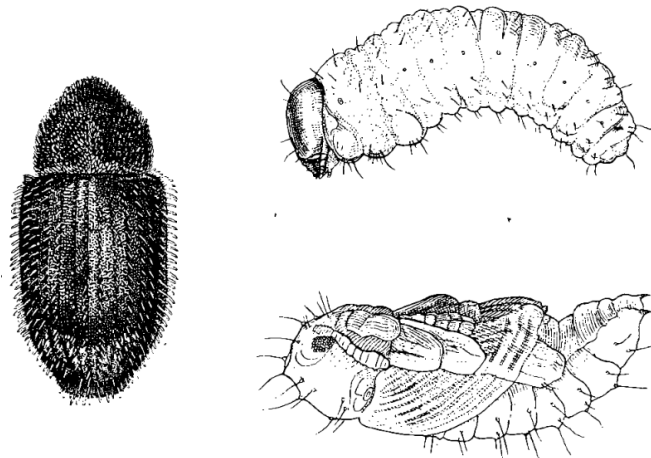
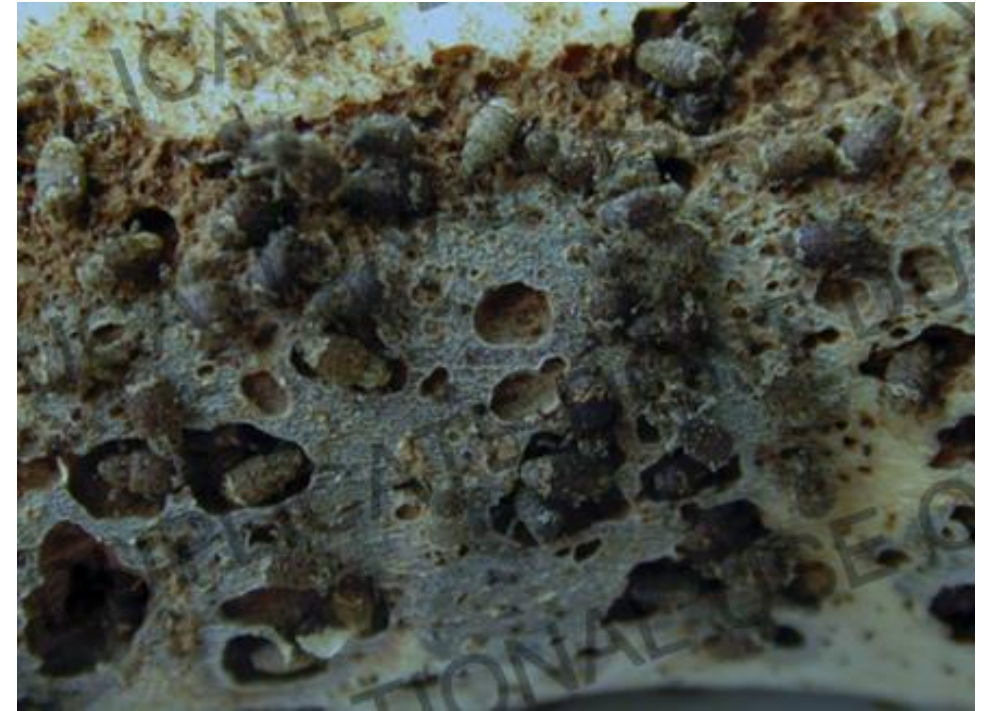


FIG. 9—Larva, pupa and adult, *Cryptorhynchus batatae* Waterh., a common sweet potato weevil. 12 x nat. size.



Sweetpotato Vine Borer

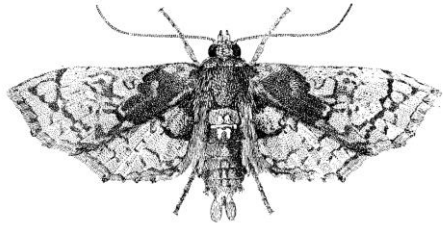


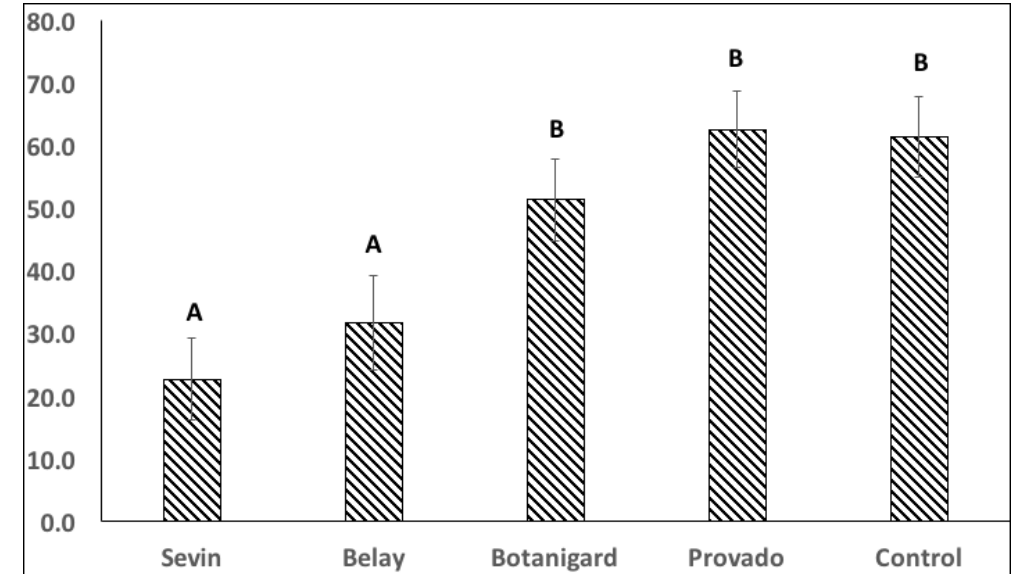
FIG. 6—Larva, pupa and moth, *Omphisa anastomosalis* Guen. The larva is the sweet potato stem-borer. 3 x nat. size.

- *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>
- <https://www.ctahr.hawaii.edu/oc/freepubs/pdf/B-22.pdf>

