

Kauai Master Gardener Weed 2017

Joe DeFrank
UH-Manoa
Tropical Plant and Soil Science



Topics Covered

- 1. Web based resources for weed ID and control recommendations.**
- 2. Nutsedge management options.**
- 3. Turn the page farming-weed control possibility for organic crop production.**
- 4. Sprayer calibration for home owner lawn weed control.**



For more information on topics covered

<http://www.ctahr.hawaii.edu/deFrankJ/index.htm>

WEED CONTROL IN HAWAII WITH DR. JOE DEFRANK

Professor of Weed Science - University of Hawaii Department of Tropical Plant and Soil Science



[Weed Science 481-Fall 2011- Lecture notes and handouts](#)

[Weed ID Gallery - Economically Important weeds in vegetables, turf and potted ornamentals in Hawaii.](#)

[Streaming Media Content](#) ←

[Plants for People: Beverage Crops, Fall 2011 with Dr. Skip Bittenbender](#)

[ASHS 2011 WORKSHOP: Propagation Techniques of Select Tropical Ornamentals, Specialty Crops, and Native Plants in Hawaii](#)

[TPSS 491/711 Digital Tools for Scientific Content Fall 2012](#)



Tropical Plant & Soil Sciences Department
University of Hawaii at Manoa

For more information on topics covered

<http://www.ctahr.hawaii.edu/deFrankJ/index.htm>

[TPSS 365 Horticultural Practices with Dr. Joe DeFrank discussing air layering tropical ornamental hardwood trees on 10/23/15. \(posted 10/26/15\)](#)

[PEPS/TPSS 418 Turfgrass Pests and Management, Dr. DeFrank's lecture: Applied Weed Control Technology: Tropical turf grass management research to develop improved control of grassy weeds in Bermuda sport turf on 10/19/2015. \(posted 10/20/15\).](#)

[Turn the Page Farming, a non-chemical method of weed control for organic farmers. Laboratory lecture presented to students of the Weed Science class \(TPSS/PEPS 481\) ON 09/02/2015. \(posted 10/11/15\).](#)

[Weed Control in Tropical Turf and Roadside Landscapes Planted to Native Hawaiian Plants. Seminar presented at the 15th Annual Crop Protection Services Seminar and Tradeshow on May 15, 2015 \(posted 05/18/15\).](#)

[Master Gardening Training, Oahu: Weed Science-2015 \(posted 03/30/15\).](#)

[Weed Control in Tropical Cropping Systems. Departmental seminar in Tropical Plant and Soil Science. \(posted 03/23/15\).](#)

[Time of Year Considerations for Grassy Weed Control in Warm Season Turf. Seminar presented at the Pacific Agriculture Sales and Service Trade Show. \(posted 02/03/15\).](#)

For more information on topics covered

Viewing tips for live seminar presentations – Open 2 browser windows
1- for video and 1 – for high resolution slides as pdf

Web resources_2012

www.ctahr.hawaii.edu/deFrankJ/NON_HOMEPAGE_PAGES/Web_resources_Weed_ID_control_10122012.htm

Web Based Resources For Weed I.D. And Control, Problems Weeds In Hawaiian Turf And Purple Nutsedge Control In Gardens And Ornamental Nursery Beds - 2012

On October 12, 2012, Dr. DeFrank made a presentation to participants of the "DOD Pesticide Applicator Recertification & PMPAR Training NAVFAC Pacific and HIJIRSG" at Ford Island on Oahu. The participants are part of federal employee's pesticide certification program required of all pesticide handlers. This presentation covers Dr. DeFrank's selected web based resources for Hawaii weed I.D. and control recommendations. Problem sedge and broadleaf weeds are described and control recommendations for warm season turf are discussed. The presentation concludes with an in-depth description of the biology of Purple Nutsedge and IPM practices used to control this important weed with cultivation, systemic herbicides and woven black plastic weed mat.

For more information on this presentation contact:
Dr. Joe DeFrank
email.defrenk@hawaii.edu
Phone: 808-956-5698.

Suggested method to view streaming media and slideshow:

1. Open two browser windows, one will be used to view the "talking head" and the other will be used to view the slide show images as an Adobe pdf.
2. Click on the link to "view lecture", let the program download and start then hit pause.
3. In the second window open the pdf version of the slide show and once the first slide appears return to lecture and resume play.
3. With two windows open, one for the video and one for the slide show you can follow the lecture for the queues to change the slide image.

Title of Presentation	Media format	Seminar Handout Links to referenced web resources	Slide show images as pdf
Web based resources for weed ID and control, problems weeds of warm season turf and Purple nutsedge control. (posted 10/16/2012)	MPEG-4	pdf	Click to download slide show

HOME

2 items

Web resources_2012

www.ctahr.hawaii.edu/deFrankJ/NON_HOMEPAGE_PAGES/Web_resources_Weed_ID_c

Ornamental Nursery Beds - 2012

On October 12, 2012, Dr. DeFrank made a presentation to participants of the "DOD Pesticide Applicator Recertification & PMPAR Training NAVFAC Pacific and HIJIRSG" at Ford Island on Oahu. The participants are part of federal employee's pesticide certification program required of all pesticide handlers. This presentation covers Dr. DeFrank's selected web based resources for Hawaii weed I.D. and control recommendations. Problem sedge and broadleaf weeds are described and control recommendations for warm season turf are discussed. The presentation concludes with an in-depth description of the biology of Purple Nutsedge and IPM practices used to control this important weed with cultivation, systemic herbicides and woven black plastic weed mat.

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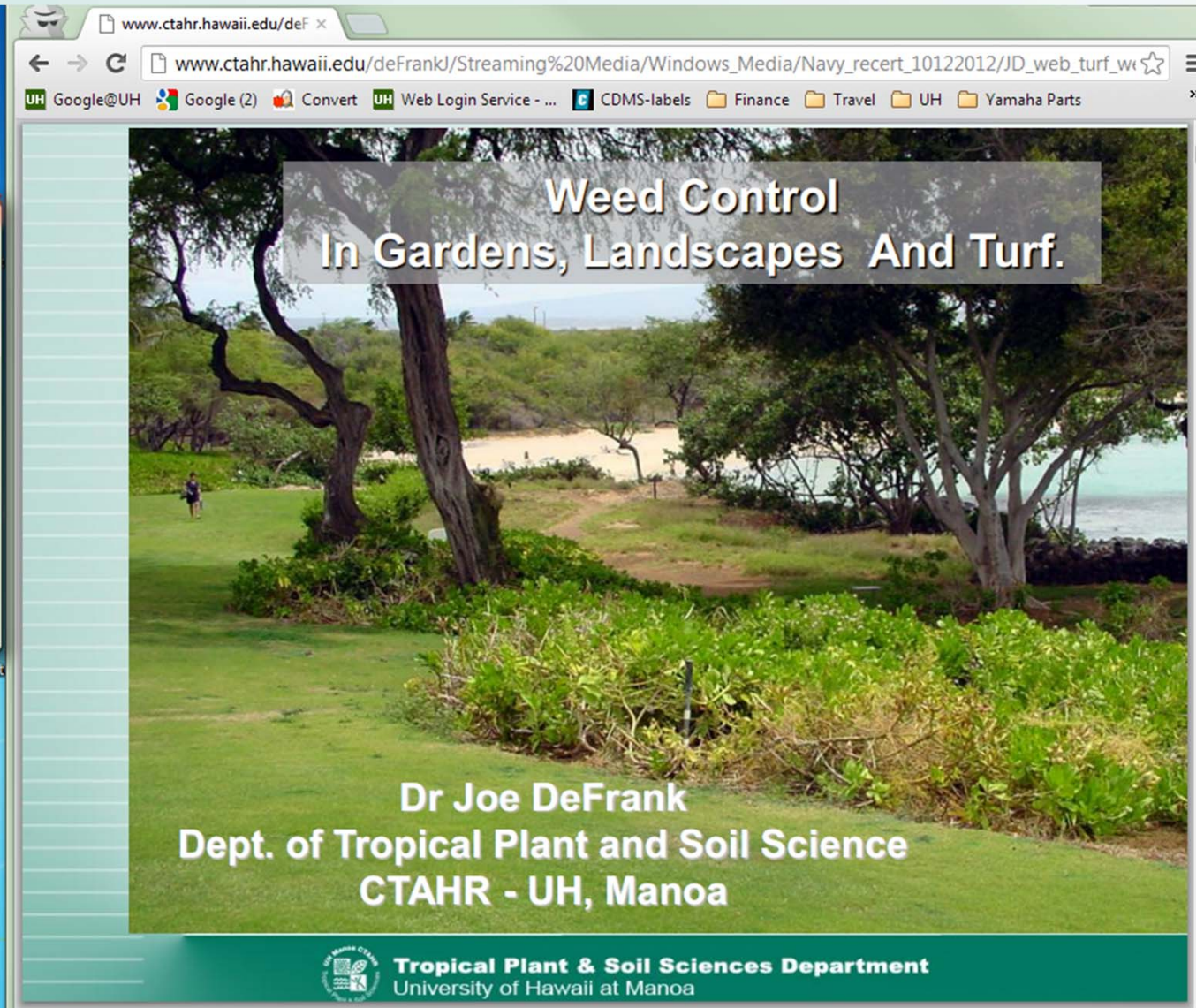
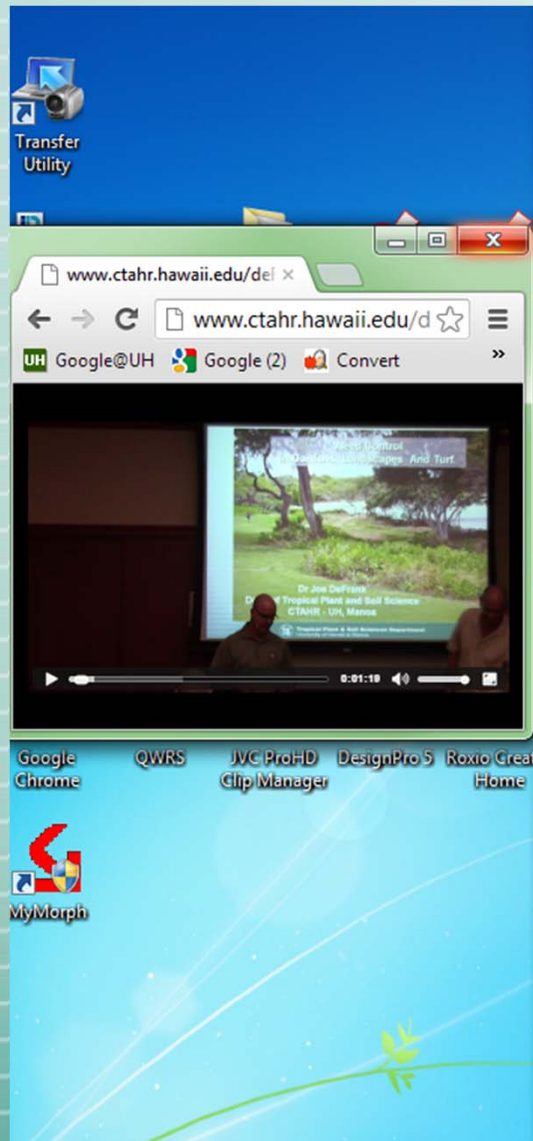
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For more information on topics covered

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1- for video and 1 – for high resolution slides as pdf



Web resources for weed control.

Dr. DeFrank's selected list of web based resources as Word document

Web Based Resources for Weed Control Information. *(all links checked on good on 04/12/17)*

Prepared by Dr. Joe DeFrank, Weed Science, TPSS- UH Manoa.
Email: defrenk@hawaii.edu, phone: 808-956-5698.

1. **On-line version of "Handbook of Hawaiian Weeds URL:**
<http://www.flickr.com/photos/uhmuseum/sets/72157616041949833/>. Line drawings and ID descriptions for common weeds in Hawaii.
2. **Weeds of Hawaii's Pastures and Natural Areas. URL:**
<http://www.ctahr.hawaii.edu/invweed/weedsHi.html>. Good quick ID guide for weedy trees, shrubs and vines in with control measure provided.
3. **Plants of Hawaii. URL:** <http://www.starrenvironmental.com/images/?o=plants>
A site for identifying many common plants found in Hawaii. This site contains 8000+ copyright free high resolution images of both native and non-native plants.
4. **Hawaii Plant ID. URL:** <http://www.flickr.com/groups/hawaiiplantid/>. Allows for free membership and submission of photos to ID plants.
5. **Hawaii Insect ID. URL:** <http://www.flickr.com/groups/hawaii-insect-id/> Allows for free membership and submission of photos for insect ID.
6. **The National List of allowed and prohibited substances. URL:** <https://www.ams.usda.gov/rules-regulations/organic/national-list> . Identifies the synthetic substances that may be used and the nonsynthetic (natural) substances that may not be used in organic crop and livestock production. It also identifies a limited number of non-organic substances that may be used in or on processed organic products. Related to the National list is the "Petitioned Substances" list. URL: <https://www.ams.usda.gov/rules-regulations/organic/national-list/e> . This links provides the latest substances that have been submitted data to be added to the national list.
7. **Greenbook. URL:** <http://www.greenbook.net/>. Excellent free site for searching for pest control chemicals in specific sites. After completing user profile, allows for complex searches of pesticides based on crops and pests. Has section on organic production products. Many produce labels and MSDS available here .

Use the Word document to find sites listed on the handout.

All links good on 04/12/2017



Web resources for weed control.
On-line Handbook of Hawaiian Weeds
<http://www.flickr.com/photos/uhmuseum/sets/72157616041949833/>

Weeds of Hawaii

Handbook of Hawaiian Weeds. Edited by E. L. Haselwood and G. G. Motter (1966).



Ipomoea alba
by University of Hawaii Museum Consortium ☆



Web resources for weed control.

<http://www.flickr.com/photos/uhmuseum/sets/72157616041949833/>



[University of Hawaii Muse...](#)

+ Follow

Ipomoea obscura

MORNING-GLORY

Description:

A twining plant. Leaves ovate to heart-shaped, sharp pointed, entire, nearly smooth, 1 to 4 inches long. Flowers bell-shaped, about 1 inch long, on long stalks; sepals ovate; corolla yellow or cream with yellow bands, and with a purple base. Seeds velvety (11, 15).

Propagation:

By seed.

Habitat:

A weed in wastelands.

History:

Native to southern Asia and Mascarene Islands.



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Web resources for weed control.

Weeds of Hawaii Pastures

URL: <http://www.ctahr.hawaii.edu/invweed/weedsHi.html>



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Info for Homeowners

Info for Conservation

Info for Farmers

Info for Ranchers

Weeds of Hawaii

Videos

Links

Contact CTAHR Scientists

Dr. James Leary

Dr. Joe DeFrank

Dr. Ted Radovich

Weeds of Hawaii

Weeds of Hawaii's Pastures and Natural Areas; An Identification and Management Guide by P. Motooka, L. Castro, D. Nelson, G. Nagai, and L. Ching. ©2003, College of Tropical Agriculture and Human Resources, University of Hawaii at Manoa.

Available for sale from CTAHR, this book includes a quick visual key to help quickly identify weedy trees, shrubs, vines, herbs and grasses found in Hawaii. Individual fact sheets from the publication are available below (.pdf).

- *Abrus precatorius*, Precatory bean, black-eyed susan, bead vine, rosary pea
- *Acacia confusa*, Formosa koa, small Philippine acacia, yanangi (Belau)
- *Acacia farnesiana*, Klu, huisache
- *Acacia mearnsii*, Black wattle
- *Ageratina adenophora*, Maui pamakani
- *Ageratum conyzoides*, Tropic ageratu
- *Amaranthus spinosus*, Spiny amaranth, pigweed
- *Andropogon virginicus*, Broomsedge
- *Ardisia elliptica*, Shoebuttan ardisia
- *Arthrostemum ciliatum*, Arthrostemum
- *Asclepias physocarpa*, Balloon plant
- *Asystasia gangetica*, Chinese violet, coromandel
- *Axonopus fissifolius*, Narrowleaved carpetgrass
- *Bambusa vulgaris*, Feathery bamboo, common bamboo
- *Batis maritima*, Pickle weed, akulikulikai
- *Bidens pilosa*, Hairy beggartick, Spanish needle
- *Blechnum occidentale*, Blechnum fern
- *Bocconia frutescens*, Bocconia, plume poppy, tree poppy
- *Boerhavia coccinea*, Red spiderling
- *Brachiaria mutica*, Paragrass, californiagrass, panicumgrass, buffalograss
- *Buddleia asiatica*, Dog tail, huelo ilio
- *Buddleia madagascariensis*, Smoke bush
- *Caesalpinia decapetala*, Catsclaw, popoki, wait-a-bit, Mysore thorn, puakelekino
- *Casuarina equisetifolia*, Ironwood, Australian pine, horsetail casuarina, coast she-oak, whistling pine, horsetail beefwood, Australian oak, swamp oak, toa (Samoa)
- *Cenchrus ciliaris*, Buffelgrass
- *Cenchrus echinatus*, Common sandbur

Buddleia asiatica

Dog tail, huelo 'ilio

Buddleia asiatica Lour.

Family: Buddleiaceae

Description: Shrub to 20 ft tall. Young stems hairy. Leaves opposite, alternate higher on the stem, 2–12 inches long by 3 inches wide, margins finely serrate. Flowers small, white or lavender, or greenish, in drooping tail-like inflorescence. Fruits are dry capsules, 0.2 inches long. Seeds tiny, winged on both ends. Genus named in honor of Rev. Adam Buddle, 17th–18th century English vicar and botanist⁽⁷⁰⁾; *asiatica*, of Asia⁽⁶⁹⁾.

Distribution: Native to south Asia, Taiwan, and Malaysia. Very common in mesic to wet pastures, forests, roadsides, and waste areas of O'ahu, Moloka'i, Maui, and Hawai'i up to 4000 ft elevation. Collected on O'ahu in 1908⁽⁷⁰⁾.

Environmental impact: Invades disturbed areas of forests.



Management: Sensitive to glyphosate and hormone-type herbicides. Very sensitive to triclopyr ester applied to basal bark (10% product in oil) and triclopyr amine in foliar application at 2% product in water.



Web resources for weed control.

Plants of Hawaii – by Forest & Kim Starr

URL: <http://www.hear.org/starr/images/?o=plants>

Plants of Hawaii

[Family Index](#) : [Species Index](#)

Images of plants found in Hawaii, by [Forest & Kim Starr](#) ([Image use policy](#)). Need a plant identified? Try [Hawaii Plant ID](#).

Scientific Name	Common Name	Family
Abelia x grandiflora	Glossy abelia	Caprifoliaceae
Abelmoschus esculentus	Okra, gumbo, lady's finger	Malvaceae
Abrus precatorius	Black-eyed Susan, rosary pea	Fabaceae
Abutilon eremitopetalum *	Hidden petal abutilon	Malvaceae
Abutilon grandifolium	Hairy abutilon	Malvaceae
Abutilon incanum	Hoary abutilon	Malvaceae
Abutilon menziesii *	Kooloaula	Malvaceae
Abutilon pictum	Lantern ilima, royal ilima	Malvaceae
Abutilon x hybridum	Hybrid abutilon	Malvaceae
Abutilon x milleri	Trailing abutilon	Malvaceae
Acacia aneura	Mulga acacia	Fabaceae
Acacia aulacocarpa	Hickory wattle, brown salv	
Acacia auriculiformis	Earpod wattle	
Acacia confusa	Formosa koa	
Acacia farnesiana	Klu	
Acacia koa *	Koa	
Acacia koaia *	Koaia, dwarf koa	
Acacia mangium	Mangium wattle	
Acacia mearnsii	Black wattle	
Acacia melanoxylon	Australian blackwood	
Acacia podalyriifolia	Queensland silver wattle	
Acacia retinodes	Water wattle	
Acacia sp.	Unknown acacia	
Acalypha hispida	Chenille plant, red hot catt	
Acalypha reptans	Cat tail	
Acalypha wilkesiana	Copper leaf, beefsteak	
Acanthospermum australe	Spiny-bur, Paraguay bur,	
Acca sellowiana	Pineapple guava	

Home > [Malvaceae](#) > [Abutilon incanum \(hoary abutilon\)](#)

[Abutilon incanum \(hoary abutilon\)](#)
Seed capsules at Lahaina Pali Trail, Maui. December 09, 2002.

Home > [Malvaceae](#) > [Abutilon incanum \(hoary abutilon\)](#)
Search

Native: Indigenous?

Abutilon incanum (Hoary abutilon)
Habitat with Kim and Forest
Puu Pehe, Lanai
April 06, 2006
060406-7299

Abutilon incanum (Hoary abutilon)
Camp
Honokanala, Kahoolawe
July 31, 2003
030731-0133

Abutilon incanum (Hoary abutilon)
Habitat and view Puu pehe
with Kim and Forest
Puu Pehe Cove, Lanai
April 05, 2007
070405-6861

Abutilon incanum (Hoary abutilon)
Habitat and view Puu pehe
Puu Pehe Cove, Lanai
April 05, 2007
070405-6859

Abutilon incanum (Hoary abutilon)
Flower
Kealahakiki, Kahoolawe
October 14, 2004
041014-0090

Abutilon incanum (Hoary abutilon)
Helicopter LZ
Honokanala, Kahoolawe
March 30, 2004
040330-0103

Abutilon incanum (Hoary abutilon)
Habit
Laa Kaaialalo, Kahoolawe
February 17, 2004
040217-0048

Abutilon incanum (Hoary abutilon)
Habitat too harsh
Moku Naio, Lanai
April 06, 2006
060406-7125

Abutilon incanum (Hoary abutilon)
Flower
Lahaina Pali Trail, Maui
December 09, 2002
021209-0045

Abutilon incanum (Hoary abutilon)
Habit and view
Honokanala, Kahoolawe
February 07, 2009
080707-2342

Abutilon incanum (Hoary abutilon)
Seed capsules
Lahaina Pali Trail, Maui
December 09, 2002
021209-0008

Abutilon incanum (Hoary abutilon)
Habit view nearby rocks
Puu Pehe, Lanai
April 06, 2006
060406-7316

Abutilon incanum (Hoary abutilon)
Flower
Lahaina Pali Trail, Maui
December 09, 2002
021209-0046

Abutilon incanum (Hoary abutilon)
Habit and seedheads
Molokai, Maui
April 05, 2006
060405-6992

Abutilon incanum (Hoary abutilon)
Habitat
Honokanala, Kahoolawe
May 25, 2005
050525-1879

Abutilon incanum (Hoary abutilon)
Habit
Kii, Lanai
April 06, 2006
060406-9251

Abutilon incanum (Hoary abutilon)
Habit
Lahaina Pali Trail, Maui
December 09, 2002
021209-0009

Abutilon incanum (Hoary abutilon)
Seed capsules
Lahaina Pali Trail, Maui

Abutilon incanum (Hoary abutilon)
Voucher 060406 08
Kii, Lanai

Abutilon incanum (Hoary abutilon)

Abutilon incanum (Hoary abutilon)
Seed capsule and flower bud
Lahaina Pali Trail, Maui

Abutilon incanum (Hoary abutilon)

Abutilon incanum (Hoary abutilon)

Abutilon incanum (Hoary abutilon)
Habitat and view Puu pehe
Hulopoe, Lanai

Abutilon incanum (Hoary abutilon)
Habitat view helau and
Forest

Abutilon incanum (Hoary abutilon)
Habitat view Puu Pehe
South coast, Lanai

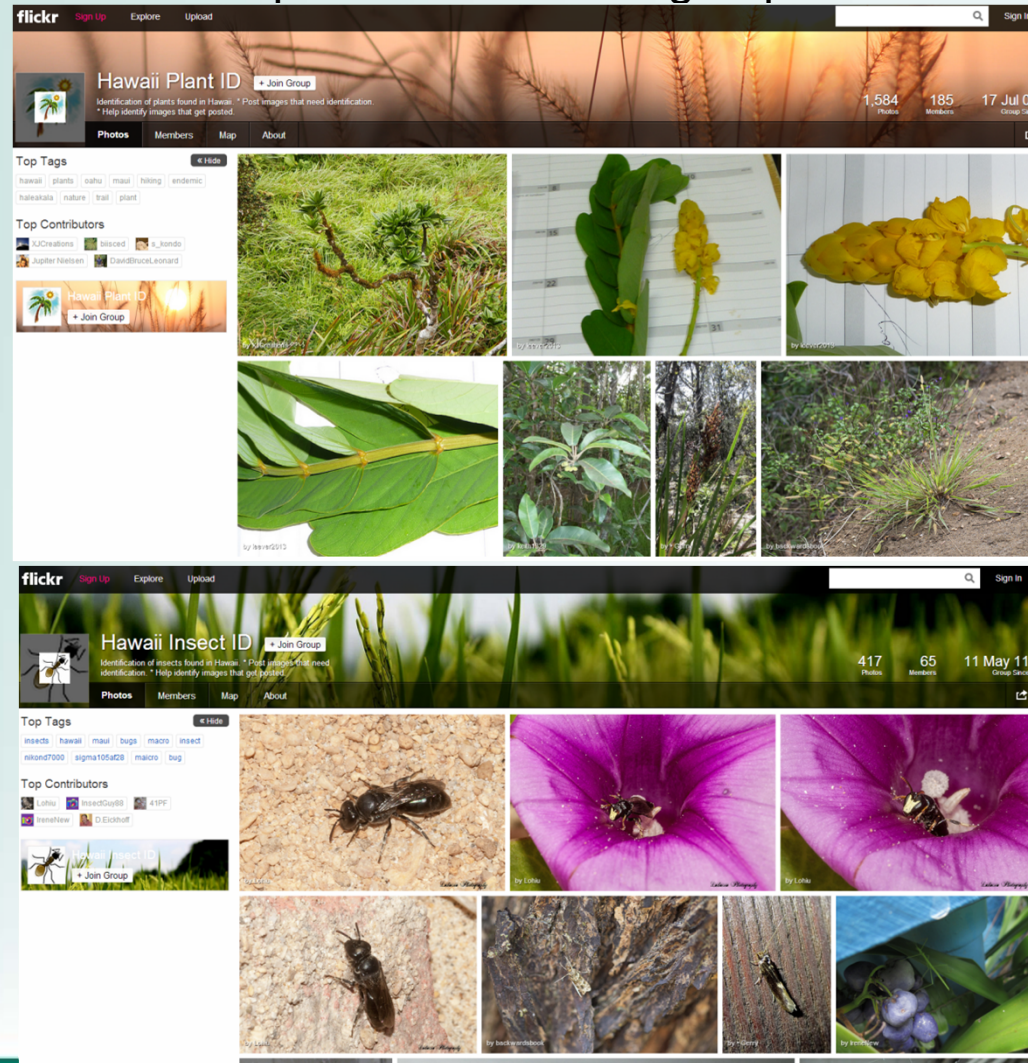
Web resources for weed control.

Hawaii Plant & Insect ID, join and submit photos, explore gallery

Plant ID = <http://www.flickr.com/groups/hawaiiplantid/>

Insect ID = <http://www.flickr.com/groups/hawaii-insect-id/>

Free to join
and submit
images for
ID
Requires a
Yahoo
account



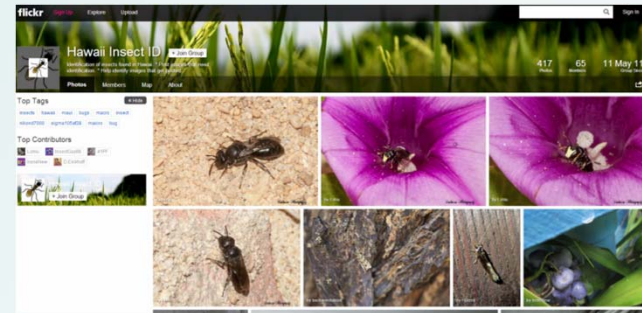
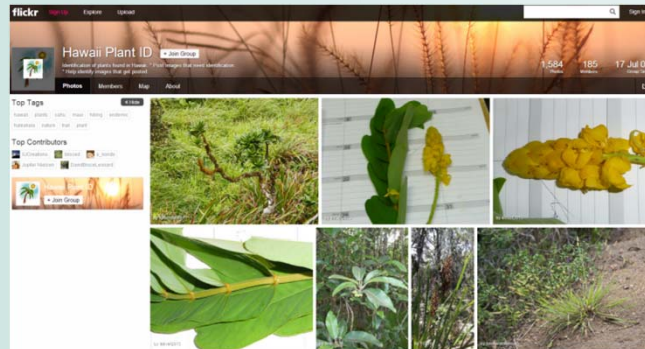
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Web resources for weed control.

Hawaii Plant & Insect ID, join and submit photos, explore gallery

Plant ID = <http://www.flickr.com/groups/hawaiiplantid/>

Insect ID = <http://www.flickr.com/groups/hawaii-insect-id/>



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Last name

Your first name is required.

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Password

Show password

+1 Mobile number

Birthday

Month

Day

Year

Male

Female

+1 Optional recovery number

Relationship

I agree to the [Yahoo Terms](#) and [Privacy](#).

Create account



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University of Hawaii at Manoa

Web resources for organic crop weed control.

National List, substances for organic crop production:

<https://www.ams.usda.gov/rules-regulations/organic/national-list>

The screenshot shows the USDA website's 'The National List' page. The header includes the USDA logo, 'United States Department of Agriculture Agricultural Marketing Service', and navigation links like 'About AMS', 'News & Announcements', 'Careers', and 'Contact Us'. A search bar is present in the top right. Below the header is a navigation menu with 'Market News', 'Rules & Regulations', 'Grades & Standards', 'Services', 'Resources', and 'Selling Food to USDA'. The main content area is titled 'The National List' and contains text explaining the list's purpose: identifying synthetic and non-synthetic substances for organic production. A sidebar on the left lists 'Organic Regulations' with links to 'Overview', 'Organic Labeling', 'The Organic Seal', 'Program Handbook', 'The National List', 'National Organic Standards Board (NOSB)', and 'Trade & Equivalency Arrangements'. A yellow circle highlights the link 'View the National List of Allowed and Prohibited Substances>'. On the right, there are social media icons, a 'SHARE' button, a 'Do I need to be organic certified?' graphic, a 'Get USDA Organic Insider updates!' button, and a 'News & Announcements' section with two bullet points: '02/22 USDA Publishes 2016 Sunset Review Notice' and '02/18 USDA Expands Insurance Options for Farmers Transitioning to Certified Organic Agriculture, New Coverage Lowers Risk for Producers and Strengthens Farm Safety Net'.



Web resources for organic crop weed control.

National List, substances for organic crop production:
<https://www.ams.usda.gov/rules-regulations/organic/national-list>

Sodium Carbonate Peroxyhydrate (PDF)

- Date Petition Received: 12/20/05
- Petition Area and Use: Crop: Add to 205.601 as algicide
- Technical Evaluation Report (2014) (PDF)
- Technical Advisory Panel Report (2006) (PDF)
- NOSB Meeting Petition Review: November-07
- NOSB Formal Recommendation (PDF)
- NOSB Committee Recommendation (PDF)
- Status: Added to the National List, section 205.601 (a), with annotation; 75 FR 77521



Web resources for organic crop weed control.

National List, substances for organic crop production:

<https://www.ams.usda.gov/rules-regulations/organic/national-list>

Sodium carbonate peroxyhydrate – algae control –wetland taro



BROAD SPECTRUM ALGAECIDE/FUNGICIDE • OXIDIZER
Treats, Controls, and Prevents Algae Growth

AGRICULTURAL AND HORTICULTURAL USES:

Agricultural Commodities and Crops, Field Grown Crops, Tree Crops, Crops Grown in Commercial Greenhouses and Plastic Houses

FOR ALGAE CONTROL IN RICE/WILD RICE FIELDS AND PADDIES:

After the field has been flooded to a depth of 4-6 inches, apply 10-25 lbs. of GreenCleanPRO per acre as a broadcast or aerial spread by plane or other professional device at the first signs of algae. Applications are most effective when made before algae rises to the water surface. Reapply as needed in accordance with General Treatment Notes.



Web resources for organic crop weed control.

National List, substances for organic crop production:

<https://www.ams.usda.gov/rules-regulations/organic/national-list>

Sodium carbonate peroxyhydrate – algae control –wetland taro

**Soap based herbicides – farmstead maintenance and orn. crops
Mulches**

- **News paper, recycled paper, non-glossy or colored inks**
- **Plastic other than polyvinyl chloride (PVC), polypropylene-OK**
- **Biodegradable bio based mulch films, restrictions on materials**
 1. **PLA: made from plant starch, corn or wheat**
 2. **AAC: joining lactic acid produced by bacterial fermentation of sugars and starches.**
 3. **PHA: a polymer derived from fermentation of sugars and fats.**



Web resources for organic crop weed control.

Petitioned Substances, substances for addition to National List.

URL: <https://www.ams.usda.gov/rules-regulations/organic/national-list/b>

USDA United States Department of Agriculture
Agricultural Marketing Service

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Organic Regulations

- Overview
- Organic Labeling
- The Organic Seal
- Program Handbook
- The National List
- National Organic Standards Board (NOSB)
- Trade & Equivalency Arrangements

Petitioned Substances: B

A | B | Ca-Cn | Co-Cz | D | E | F | G | H | I | J | K | L | M | N | O | P | R | S | T | U | V | W | X | Y | Z

[Biodegradable Mulch Film Made from Bioplastics \(PDF\)](#)

- Petition Date: 01/20/12; revised 03/26/12
- Petition Area and Use: Crops: 205.601, mulch
- Technical Evaluation Report (2012) (PDF)
- Report on Biodegradable Biobased Mulch Films (2015) (PDF)
- NOSB Meeting Petition Review: Oct-12
- NOSB Formal Recommendation (PDF)
- NOSB Subcommittee Proposal (PDF)
- Proposed Rule published August 23, 2013 [78 FR 52100]
- Final Rule published September 30, 2014 [79 FR 58655]
- **Status: Added to National List, 205.601(b)**

SHRRE

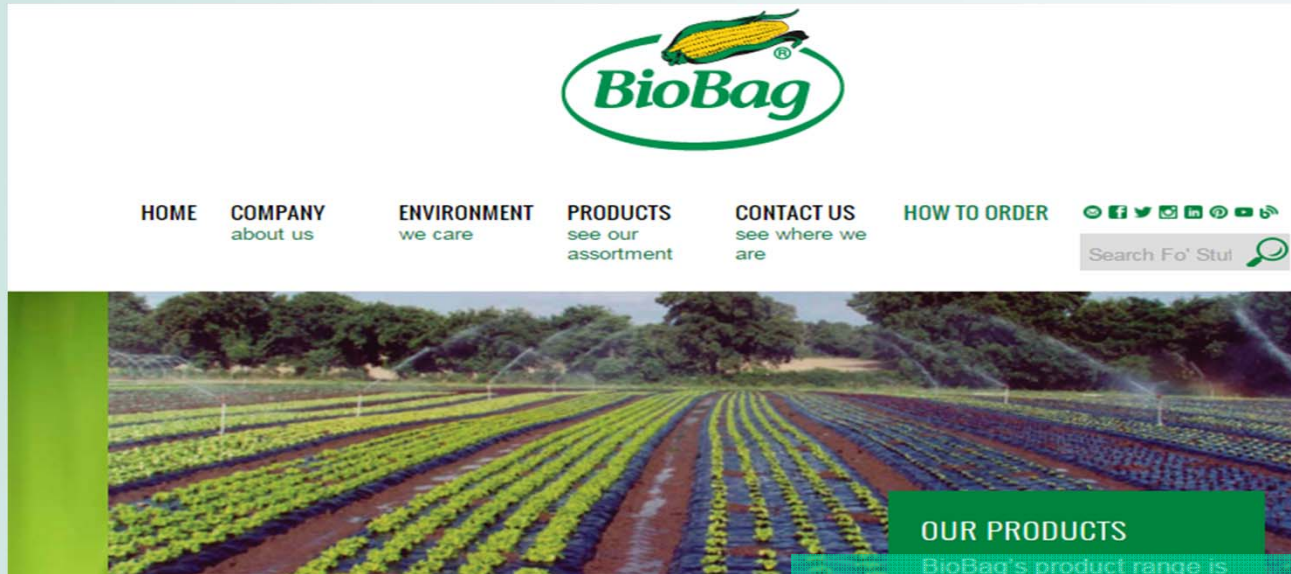
Do I need to be organic certified?

Get USDA Organic Insider updates!

News & Announcements

Department

Web resources for organic crop weed control.
Biodegradable plastic mulch for organic weed control
URL: <http://biobagusa.com/products/agricultural-film/>



OUR PRODUCTS

BioBag's product range is



At planting



80 days after planting

Web resources for Ag-crops weed control.

Greenbook.com search for labels and related info (<http://www.greenbook.net/>)



greenbook
DATA SOLUTIONS.

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Plant protection product data for the agriculture industry

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Greenbook works directly with chemical manufacturers to convert product labeling documents into indexed and actionable data elements, providing customers, clients and third-party precision agriculture application partners with the pesticide data they need to safeguard and grow their business.



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Web resources for Ag-crops weed control.

Greenbook.com for herbicide labels and safety info (<http://www.greenbook.net/>)



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[Plant Protection Community](#)

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Advanced Search

Find labels and application rates for over 12,000 plant protection products

<input type="text" value="Enter search term"/>	State <input type="text"/>
Active Ingredient <input type="text"/>	Product Category <input type="text"/>
Crop/Site Category <input type="text"/>	Crop/Site <input type="text"/>
Company <input type="text"/>	Product <input type="text"/>
Pest Category <input type="text"/>	Pest <input type="text"/>

THAT'S RIGHT.
Yield-robbing weeds are no match for Sonic® herbicide.


[LEARN MORE](#)



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University of Hawaii at Manoa


Web resources for Ag-crops weed control.

Greenbook.com for herbicide labels and safety info (<http://www.greenbook.net/>)



Search Agrochemical

[← Back](#)



Advanced Search

Find labels and application rates for over 12,000 plant protection products

<input type="text" value="Enter search term"/>	State
Active Ingredient	Product Category
Crop/Site Category	Crop/Site
Company	Product
Pest Category	Pest

Submit Clear

Web resources for Ag-crops weed control.

Greenbook.com for herbicide labels and safety info (<http://www.greenbook.net/>)

Advanced Search

Find labels and application rates for over 12,000 plant protection products

<input type="text" value="Enter search term"/>	Hawaii
Active Ingredient	Herbicide
Agricultural Crops	Papaya (Carica papaya)
Company	Product
Weeds	Select Pest

Search Results

38 products



Web resources for landscape weed control.

Greenbook.com for herbicide labels and safety info (<http://www.greenbook.net/>)

Aim EC

FMC Corporation

Active Ingredients: Carfentrazone-ethyl

Goal 2XL

Dow AgroSciences

Active Ingredients: Oxyfluorfen

GoalTender

Dow AgroSciences

Active Ingredients: |

Roundup WeatherMAX

Monsanto Company

Active Ingredients: Glyphosate Potassium Salt

Classification: Group C Herbicide

Crop/Site = Papaya

Chateau

Valent

Active ingredient: Flumioxazin

Diuron 4 L

Makhteshim Agan of North America, Inc.

Active Ingredients: Diuron

Scythe

Gowan Company

Active Ingredients: Pelargonic Acid



NPIRS – Pesticides registered in HI.

SEARCH HAWAII STATE PESTICIDE PRODUCTS

Search for pesticide products currently registered in a state using *one* of the following methods: EPA Registration Number, State Product Name, State Company Name or Active Ingredient. Only a single keyword ie., lemongrass or keyword set ie., lemon oil, may be used as your search criterion.

EPA REGISTRATION NUMBER

Search by the two-part EPA registration number using the following format: company number-product number.

PRODUCT NAME

Search by the full or partial name of a product registered in a state.

COMPANY NAME

Search by the full or partial name of a company registering products in a state.

ACTIVE INGREDIENT

Search by the PC code, Chemical Abstract Services Number (CAS) or the full or partial chemical name.

Learn more about these STATE search options and other available product information.

HAWAII STATE PRODUCT REPORT

Product Name Keyword: chateau

Number of Currently Registered Products: 1



View the label in the US EPA Pesticide Product Label System (PPLS).

View the label in the Accepted Labels State Tracking and Repository (ALSTAR).

CHATEAU HERBICIDE SW

EPA Registration Number: 59639-99  HI Product Number: 9556.108

Company Number: 9556

VALENT U.S.A. CORPORATION

P.O. BOX 8025,

WALNUT CREEK CA 94596-8025

Registration Year: 2016

Percent	Active Ingredient
51.0000	Flumioxazin (129034)

Weed Management in Vegetable Crops (Weed Management Guide)

http://edis.ifas.ufl.edu/topic_guide_wg_weed_management_in_vegetable_crops

The screenshot shows a web page with a blue navigation bar at the top containing links for Home, FAQs & Help, Local Offices, IFAS Bookstore, and Advanced Search. A search box is on the right of the bar. Below the navigation bar is a left sidebar with a light blue background, containing a 'Related Topics' section with links to Weed Management Guide, Vegetable Gardening, and Vegetable Weeds. Below that are sections for Feature Pages, Departments & Programs, Authors, and Frequent Users. The main content area has a white background and features the title 'Weed Management in Vegetable Crops (Weed Management Guide)' in blue. To the right of the title are social media icons for Facebook, Google+, Twitter, YouTube, and a plus sign, followed by a '0' in a circle. Below the title is a 'Publications' section with a list of 20 items, each starting with a bullet point and a link to a specific weed management topic. To the right of the publications is a 'What is EDIS?' box with a light orange border, containing text about EDIS being an electronic data source. Below that is an 'Additional IFAS Sites' box with a light orange border, listing the College of Agricultural and Life Sciences, IFAS Extension, and IFAS Research.

Home FAQs & Help Local Offices IFAS Bookstore Advanced Search Search GO

▼ Related Topics
Weed Management Guide
Vegetable Gardening
Vegetable Weeds

► Feature Pages
► Departments & Programs
► Authors
► Frequent Users

Weed Management in Vegetable Crops (Weed Management Guide)

f G+ T+ Y+ 0

Publications

- [Estimated Effectiveness of Recommended Herbicides on Selected Common Weeds in Florida Vegetables](#)
- [Weed Management in Bean and Pea \(Bush, Pole, Lima Bean, English Pea, and Southern Pea\)](#)
- [Weed Management in Beet](#)
- [Weed Management in Bulb Crops \(Onion, Leek, Garlic, Shallot\)](#)
- [Weed Control in Carrot](#)
- [Weed Management in Celery](#)
- [Weed Control in Cole or Brassica Leafy Vegetables \(Broccoli, Cabbage, Cauliflower, Collard, Mustard, Turnip, and Kale\)](#)
- [Weed Management in Cucurbit Crops \(Muskmelon, Cucumber, Squash, and Watermelon\)](#)
- [Weed Management in Eggplant](#)
- [Weed Management in Leafy Greens \(Lettuce, Endive, Escarole, and Spinach\)](#)
- [Weed Management in Okra](#)
- [Weed Management in Parsley and Cilantro](#)
- [Weed Management in Pepper](#)
- [Weed Management in Potato](#)
- [Weed Management in Strawberry](#)
- [Weed Management in Sweet Corn](#)
- [Weed Management in Sweet Potato](#)
- [Weed Management in Tomato](#)

What is EDIS?

EDIS is the Electronic Data Information Source of UF/IFAS Extension, a collection of information on topics relevant to you. More...

Additional IFAS Sites

- [College of Agricultural and Life Sciences](#)
- [IFAS Extension: Solutions for Your Life](#)
- [IFAS Research](#)

Tropical Fruit Pest Management

http://edis.ifas.ufl.edu/topic_tropical_fruit_ipm

The screenshot shows the EDIS website interface. At the top, there is an orange banner with the text "University of Florida IFAS Extension" on the left and "Solutions for Your Life" on the right. Below this is a large blue header area with the word "EDIS" in white. Underneath the header is a navigation bar with links for "Home", "FAQs & Help", "Local Offices", "IFAS Bookstore", and "Advanced Search", along with a search box and a "GO" button. The main content area is divided into three columns. The left column contains a "Related Topics" section with links to "Tropical Fruit", "Fruit and Nut Pest Management by crop", "Feature Pages", "Departments & Programs", "Authors", and "Frequent Users". The middle column is titled "Tropical Fruit Pest Management" and includes a "Subtopics" section with links to "Tropical Fruit Pests", "Mango Pest Management", and "Pineapple Pest Management", and a "Publications" section with a link to "Pesticides Registered for Tropical Fruit Crops in Florida". The right column contains a "What is EDIS?" section with a brief description and a "More..." link, and an "Additional IFAS Sites" section with links to "College of Agricultural and Life Sciences", "IFAS Extension: Solutions for Your Life", and "IFAS Research". At the bottom of the page, there is a footer with copyright information and a note about Google Analytics, and the University of Florida logo.

University of Florida IFAS Extension Solutions for Your Life

EDIS

Home FAQs & Help Local Offices IFAS Bookstore Advanced Search Search GO

- Related Topics
 - Tropical Fruit
 - Fruit and Nut Pest Management by crop
- Feature Pages
- Departments & Programs
- Authors
- Frequent Users

Tropical Fruit Pest Management

f G t + 0

Subtopics

- Tropical Fruit Pests
- Mango Pest Management
- Pineapple Pest Management

Publications

- Pesticides Registered for Tropical Fruit Crops in Florida

Top

What is EDIS?

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UF UNIVERSITY of FLORIDA

Web resources for Ag-crops weed control.

2016 North Carolina Ag. Chemical Manual

URL: <https://content.ces.ncsu.edu/north-carolina-agricultural-chemicals-manual>

Table of Contents **MANY CROP PRODUCTION TOPICS ARE LISTED**

VII. CHEMICAL WEED CONTROL

Chemical Weed Control in Field Corn; Cotton; Peanuts; Sorghum; Soybeans; Sunflowers; Tobacco; and Wheat, Barley, Oats, Rye, and Triticale

Glyphosate Formulations; Herbicide Resistance Management; Herbicide Modes of Action for Hay Crops, Pastures, Lawns and Turf

Chemical Weed Control in Clary Sage; Small Fruit Crops; Hay Crops and Pastures; Lawns and Turf; Ornamentals; Vegetable Crops; and Forest Stands

Forest Site Preparation, Stand Conversion, Timber Stand Improvement; Aquatic Weed Control, Biological Control of Aquatic Weeds with Triploid Grass Carp; Chemical Control of Aquatic Plants; Pond Dyes; Chemical Control of Specific Weeds; and Woody Plants

Total Vegetation Control on Noncropland



Web resources for Ag-crops weed control.

2017

North Carolina Ag. Chemical Manual <http://ipm.ncsu.edu/Agchem/agchem.html>

Chapter VII — 2016 N.C Agricultural Chemicals Manual

Table 7-16. Chemical Weed Control in Vegetable Crops

Weed	Herbicide, Mode of Action Code* and Formulation	Amount of Formulation Per Acre	Pounds Active Ingredient Per Acre	Precautions and Remarks
Greens (Collard, kale, mustard, and turnip greens or roots), Preplant				
Emerged broadleaf and grass weeds	pelargonic, (Scythe) 4.2 EC	3 to 10% v/v		Apply as preplant burndown rged weeds. See lable for instruction. May also be used as a banded spray between row middles. Use a shielded sprayer directed to the row middles to reduce drift to the crop.
Contact kill of all green foliage, stale bed application	paraquat, MOA 22 (Firestorm, Parazone) 3 SL	1.3 to 2.7 pt	0.5 to 1	Collard and turnip only. Apply in a minimum of 10 gallons spray mix per acre to emerged weeds before crop emergence or transplanting as a broadcast or band treatment over a preformed row. Use sufficient water to give thorough coverage. Row should be formed several days ahead of planting and treating to allow maximum weed emergence. Use a nonionic surfactant at a rate of 16 to 32 ounces per 100 gallons spray mix or 1 gallon approved crop oil concentrate per 100 gallons spray mix.
	(Gramoxone SL) 2 SL	2 to 4 pt		
Annual and perennial grass and broadleaf weeds, stale bed application	glyphosate, MOA 9 (numerous brands and formulations)	See labels	See labels	Apply to emerged weeds before crop emergence. Do not feed crop residue to livestock for 8 weeks following treatment. Perennial weeds may require higher rates of glyphosate. Consult the manufacturer's label for rates for specific weeds. Certain glyphosate formulations require the addition of surfactant. Adding nonionic surfactant to glyphosate formulated with nonionic surfactant may result in reduced weed control.
Annual grasses and small-seeded broadleaf weeds	trifluralin, MOA 3 (Treflan) 4 EC	1 to 1.5 pt	0.5 to 0.75	Do not use on turnip greens for fresh market. Apply preplant and incorporate into the soil 2 to 3 inches within 8 hr using a rototiller or tandem disk. Do not use if turnip roots are to be consumed.
	bensulide, MOA 8 (Prefar) 4 EC	5 to 6 qt	5 to 6	Also labeled for rape greens. Not labeled for turnip. Apply preplant or preemergence after planting. With preemergence application, irrigate immediately after application. See label for more directions.
	DCPA, MOA 3 (Dacthal) W-75 (Dacthal) 6 F	6 to 10 lb 6 to 10 pt	4.5 to 7.5	Also labeled for broccoli raab (raab, raab salad), mizuna, and hanover salad. Apply immediately after seeding. May also be incorporated.

Greens, Postemergence



Table 7-16. Chemical Weed Control in Vegetable Crops

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Also labeled for rape greens. Not labeled for turnip. Apply preplant or preemergence after planting. With preemergence application, irrigate immediately after application. See label for more directions.

Also labeled for broccoli raab (raab, raab salad), mizuna, and hanover salad. Apply immediately after seeding. May also be incorporated.



CDMS – Trade name search for pesticide labels

<http://www.cdms.net/Label-Database>



Product Search

Premium Search - {Login Required}



Manufacturers

Acadian Seaplants Limited	Aceto Agricultural Chemicals Corporation	Actagro, LLC
ADAMA	AgraSyst, Inc.	Agria Canada, Inc.
Agro Logistic Systems, Inc.	AgroLiquid	Agromarketing Company, Inc.

Search feature requires no-cost registration



Topical application of herbicide to inter row areas

<http://weedwipe.corecommerce.com/>

ALLEY CAT
FARM EQUIPMENT

Home Page My Account Contact Us Photos

Shopping Cart

0 Items
\$0.00

Categories

- ▶ Row Middle Wipers
- ▶ Broadcast Wipers
- ▶ Wiper Parts
- ▶ ScrubnGo

Information


- ▶ Photos
- ▶ Pull Behind Wiper
- ▶ About Us
- ▶ Wiper User Guide
- ▶ Contact Us
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Weed Wipers That Work!

Our Alley Cat Weed Wipers are an economical and effective way to control weeds. Alley Cat Weed Wipers can be used in fields, pastures, row crops or just about anywhere weeds grow.

Alley Cat Weed Wipers come in a variety of styles that can be used in plastic mulch or fields and pastures. Alley Cat Weed Wipers are hand made in the USA.





**New Alley Cat
6ft Pull Behind**

Topical application of herbicide to inter row areas

<http://weedwipe.corecommerce.com/>



Topical application of herbicide to inter row areas

<http://www.rotowiper.co.nz/>



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ROTOWIPER[®] -The Original Rotowiping System

Do you want Weed Control
without damaging your pasture or crop?

Now there is an
alternative way



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Sedge Weed Management

Purple nutsedge
Yellow nutsedge



Controlling Purple & Yellow Nutsedge

Mechanical – dry soil and cultivation

Chemical – irrigation, weed growth and chemical control

**IPM approach - makes use of water, weed mat and time,
option for chemical use too.**



Biology of Purple Nutsedge

- **Seeds – Very few, not often source of new plants**
- **Underground tubers and corms are the primary source of infestation**
- **Undisturbed will spread underground several yards a year**
 - a) **1 plant can produce 100+ tubers in 100 days**
 - b) **80-95% of tubers in top 6 inches of soil**
 - c) **some as deep as 18 inches**
- **Contamination & spread due to infested soil on equipment, boots & harvested root crops.**



Nutsedge persistence

- **Dormancy of tubers prevents complete emergence of all plants**
- **Dormancy allows constant/staggered emergence when conditions are right**
 - a) moisture & soil heating**
 - b) Deeper tubers germinate later = more time required to heat deeper soil profile.**



Purple nutsedge

Nutsedge persistence





Yellow Nutsedge



Strategies for nutsedge control

Preplant mechanical cultivation

1. In very dry soil, tubers on soil surface 10-12 days will dry out and die
2. Sequential cycles of tuber exposure will lower soil population of tubers









Mixed tool harrow
Mix soil
Lift tubers and
Smooth seed bed



Strategies for nutsedge control

Chemical weed control

1. Prepare seedbed
2. Irrigate to allow NS to germinate and grow
3. The key issue is the presence of living connective tissue, and the maximum sprouting of the tuber reservoir in the soil prior to systemic herbicide application.





SYSTEMIC HERBICIDES MOST EFFECTIVE AT THIS STAGE OF GROWTH

With flowers present

Maximum tuber emergence

+

Tubers attached to leaves

=

**Conduit for systemic
Movement to underground
parts**





Problems with this approach

1st cycle of flushing works well since nutsedge emerges rapidly from shallow soil location.

2nd & 3rd flushes from deeper soil profile, has problems!

Annual weeds overgrow nutsedge foliage before proper growth stage.

What, nutsedge needs weed control too?



Light exclusion approach for purple/yellow nutsedge control

IPM approach

1. Uses of knowledge of growth habit
2. Deep soil heating for maximum tuber germination
3. Use light exclusion for non-chemical kill
4. Prevent spreading tubers with no-till/hydroseeding & close crop plantings for rapid canopy closure
5. Compatible with organic farming systems.





Review data sheet prior to larger purchase of weed mat – Note UV Res.

Style 876

Product Data Sheet

December 2011

OK for organic crops - PVC plastic not allowed

A woven geotextile fabric, produced from polypropylene slit-film tapes, which will meet or exceed the following MARV's. This fabric has UV protection to 3500 hours in a Xenon Weatherometer.

Property	Test Method	English Units			SI Units		
		Typical Value			Typical Value		
Mass per Unit Area	ASTM D-5261	5.8		oz/yd ²	197		g/m ²
		MARV			MARV		
		MD	CD		MD	CD	
Grab Tensile Strength	ASTM D-4632	270	285	lbs	1202	1268	N
Grab Tensile Elongation	ASTM D-4632	20	15	%	20	15	%
Trapezoid Tear	ASTM D-4533	110	105	lbs	490	467	N
Puncture	ASTM D-4833	155		lbs	690		N
Permittivity	ASTM D-4491	0.04		sec ¹	0.04		sec ¹
A.C.S.	ASTM D-4751	45		U.S. Sieve	0.355		mm
UV Resistance (3500 hrs)	ASTM D-4355	70		%	70		%
Water Flow Rate	ASTM D-4491	4		gal/min/ft ²	163		l/min/m ²



Preplant kill of nutsedge tubers

1. Weed cloth held loosely to soil surface
2. No soil, rocks or mulch on mat surface
2. Nutsedge grows rapidly and snags in weave
3. 3-6 months tubers exhausted and die
4. Irrigation very important to maximize tuber germination via heat transfer to deeper soil profile



**Unexpanded leaf tip easily pokes through tight film
or down weighted areas of weed cloth**





**Pins to loosely secure
fabric to soil = holes**

**Water filled hoses to
eliminate holes in plastic**

Better sealing of edges

**No rocks or soil on plastic
Down weight allows shoots
poke through woven fabric**



Loose debris free woven mat snags shoot tips



Expanded leaf tips snag in woven weed mat
Extra heat speeds up growth

Purple Nutsedge

Yellow Nutsedge



Weeds proliferate in uncovered areas





Weeds proliferate in gaps of weed mat



Pins and nails poke holes in that reduces useful life of weed mat

Points of down pressure allow sedge leaf tips to poke through





**Weed cloth
inflates with
each
successive
flush of
tubers from
increasingly
deeper soil
levels.**

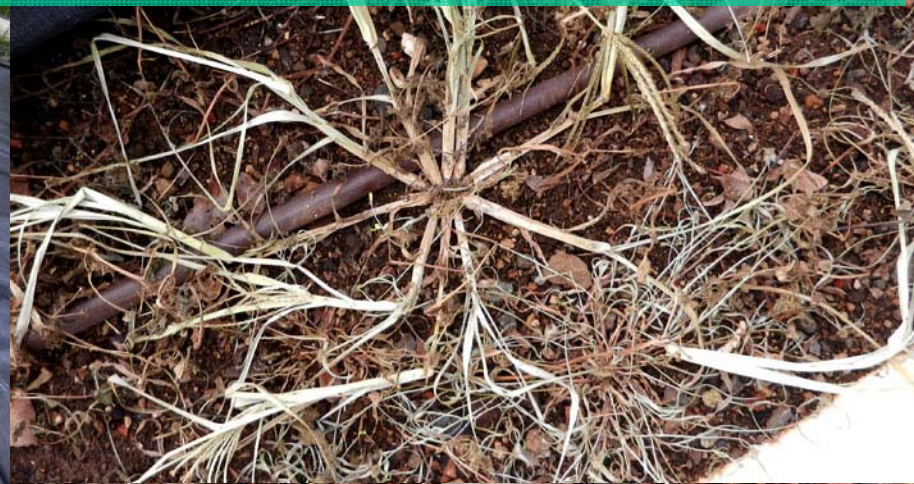


Combine weed flushing with weed mat & chemical kill to accelerate tuber purging from deep soil profiles, cover for more flushes.

- **Using irrigation on open fields is OK for the first round of tuber germination and kill.**
- **Problem with 2nd & 3rd, deeper tubers = more time = weed interference with spray applications.**
- **Monitoring tuber emergence and annual weed death under weed mat**
- **Weed free nutsedge grows out for improved spray effectiveness.**



Monitoring for annual weed seed germination and death followed by nutsedge growth in 2nd & 3rd flushes



TURN THE PAGE FARMING

NON-HERBICIDE NOTILL FARMING METHOD

- 1. No-till farming without herbicides**
- 2. Potential for organic farming systems**
- 3. Not currently used for large scale production**
- 4. Innovation and interest to upscale technique**



Considerations for Large scale use of woven weed mat For commercial scale vegetable production Note to organic farmers

In the Organic Foods Production Act, Title 7, Section 6508 of the U.S. Code, "Prohibited crop production practices and materials," plastic mulches are listed in subsection (c)(2). The section states that, "For a farm to be certified under this chapter, producers on such farm shall not -" "(2) use plastic mulches, unless such mulches are removed at the end of each growing or harvest season;"





**Mature weeds covered and killed.
Plant tissue break down rapidly
under fabric with good moisture
provided with drip tubing**



Stale seed bed = site prep, weeds grow, cover to kill then plant.





21 days of weed growth

0-day

Cover 1-wks

14-day

7-day



Good weed kill w/ 1-week of cover



14 days of weed growth

14 days weed growth + 1-wk cover



3-wks weed growth



**With small annual weeds or short term cover crops
1-2 weeks of cover provide weed free site preparation
Use hydro seeding or conventional transplanting
w/minimal soil disturbance**





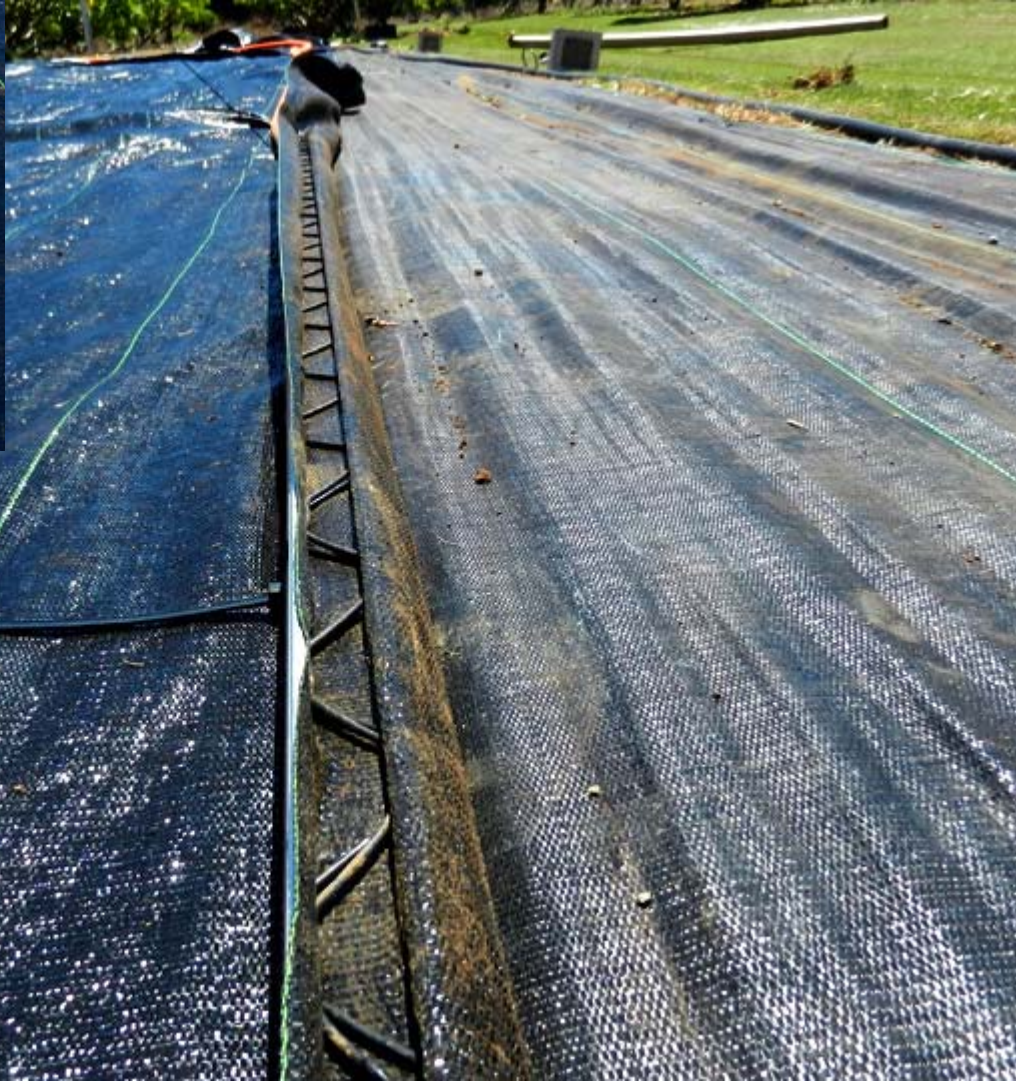
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Weed mat remains in place until ready to plant



Consider the concept of a crop module instead of a crop field
Basic size of crop module is 2 planting beds
Row length = weed mat roll, 300 ft.
Width of beds = 6 ft. Width of weed mat = 8-10 ft.





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Weed mat left edge secured in trench, right side secured with water hose



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Cover crops can be mowed, covered to kill understory weeds and then cash crop planted into nutrient rich organic mulch.



R. Hamasaki-2015

Cover crop: This is a commercial mix containing 15% oats, 30% bell beans, 20% purple/hairy vetch mix, and 35% Magnus peas.



College of Tropical Agriculture and Human Resources
University of Hawai'i at Mānoa

Hydroseed seed cover crop or lets weeds grow on the left side.



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University of Hawaii at Manoa

Cover weeds/cover crop and reveal weed free side ready to plant.



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What crops and or cover crops can be adapted to this form of seeding?



Precision seeding for banding crops over drip lines

Seeding width based on nozzle type

Tractor mounted for Longer rows

Consistent delivery of seed/mulch mix

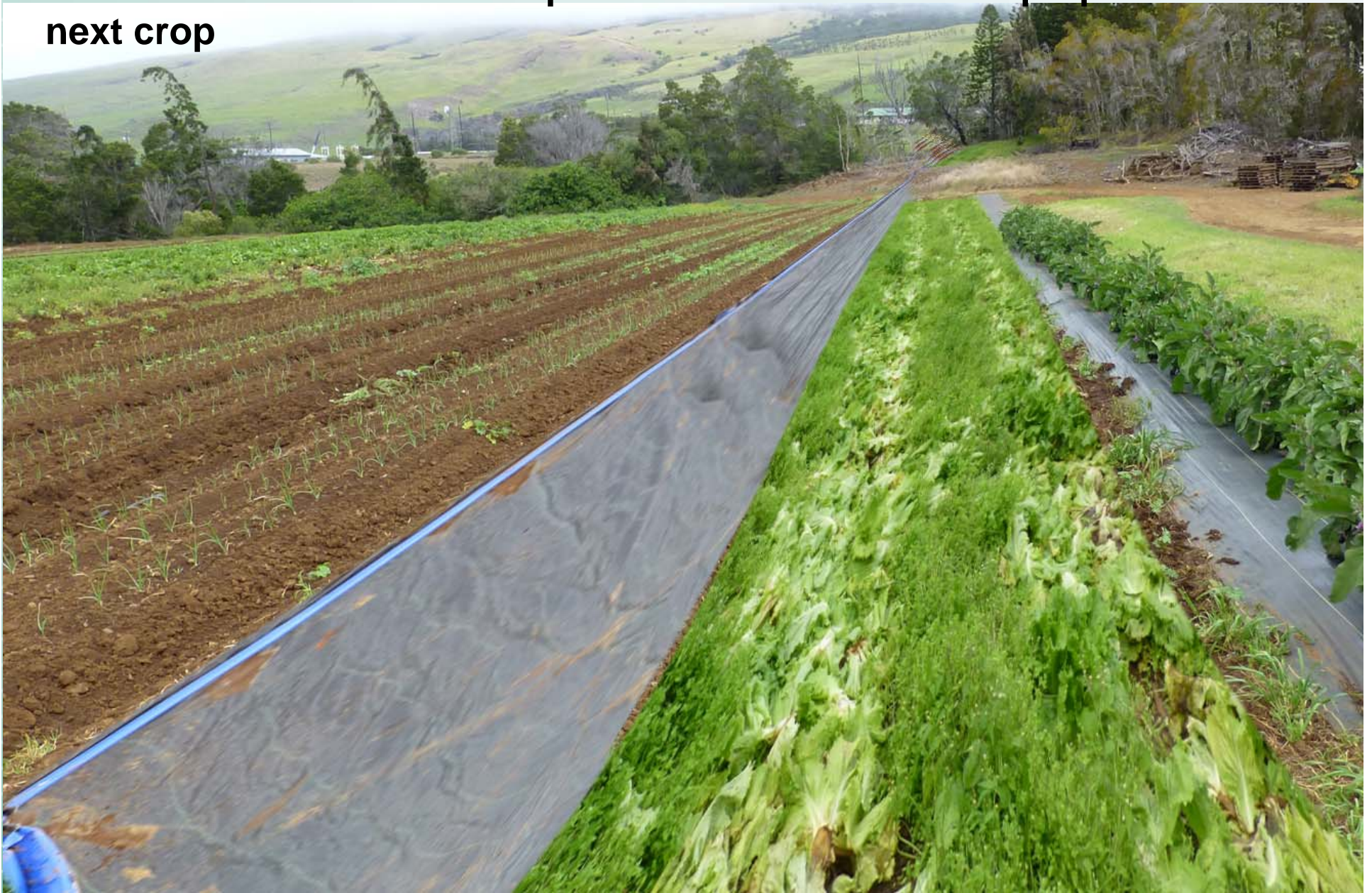


**Crop planted with transplants or using hydro seeding,
avoid soil disturbance, sub-soil has weed seeds!**



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Post harvest weeds and crop residues are covered as preparation for next crop



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**Clean bed ready for a new cash or cover crop.
What about mulching to improve weed control?**



Restriction to the use of raw animal manures for organic food crops

Grow mulch crop off site from food crop production area

Title 7 → Subtitle B → Chapter I → Subchapter M → Part 205 → Subpart C → §205.203

Title 7: Agriculture

PART 205—NATIONAL ORGANIC PROGRAM

Subpart C—Organic Production and Handling Requirements

(1) Raw animal manure, which must be composted unless it is:

(i) Applied to land used for a crop not intended for human consumption;

(ii) Incorporated into the soil not less than 120 days prior to the harvest of a product whose edible portion has direct contact with the soil surface or soil particles; or **e.g. potatoes, carrots, taro corms**

(iii) Incorporated into the soil not less than 90 days prior to the harvest of a product whose edible portion does not have direct contact with the soil surface or soil particles; **e.g. tomatoes, squash, taro leaf**

Raw animal manures cannot be used in NO-TILL organic farming



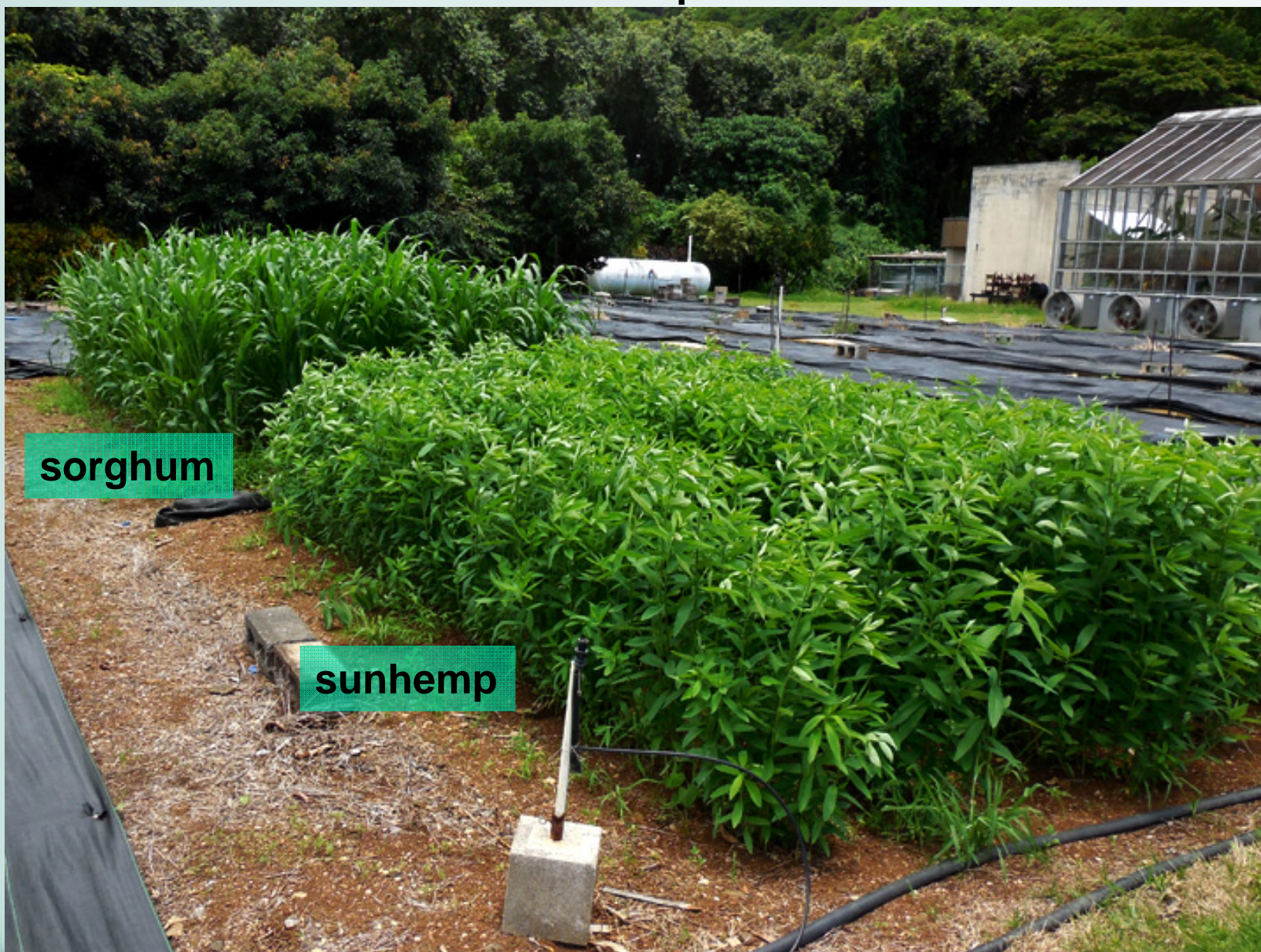
Raw manures to grow mulch

Planting mulch crops on 07/27/2016.



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University of Hawaii at Manoa

Mulch crops 35 DAP on 08/26/16



sorghum

sunhemp





The mulch crop can be produced with animal manures and used on clean beds in TTP organic farming system



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Larger scale farms use equipment to cut and haul mulch to new crop planting



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Weed cloth removed , add transplants and mulch to weed free crop production area.



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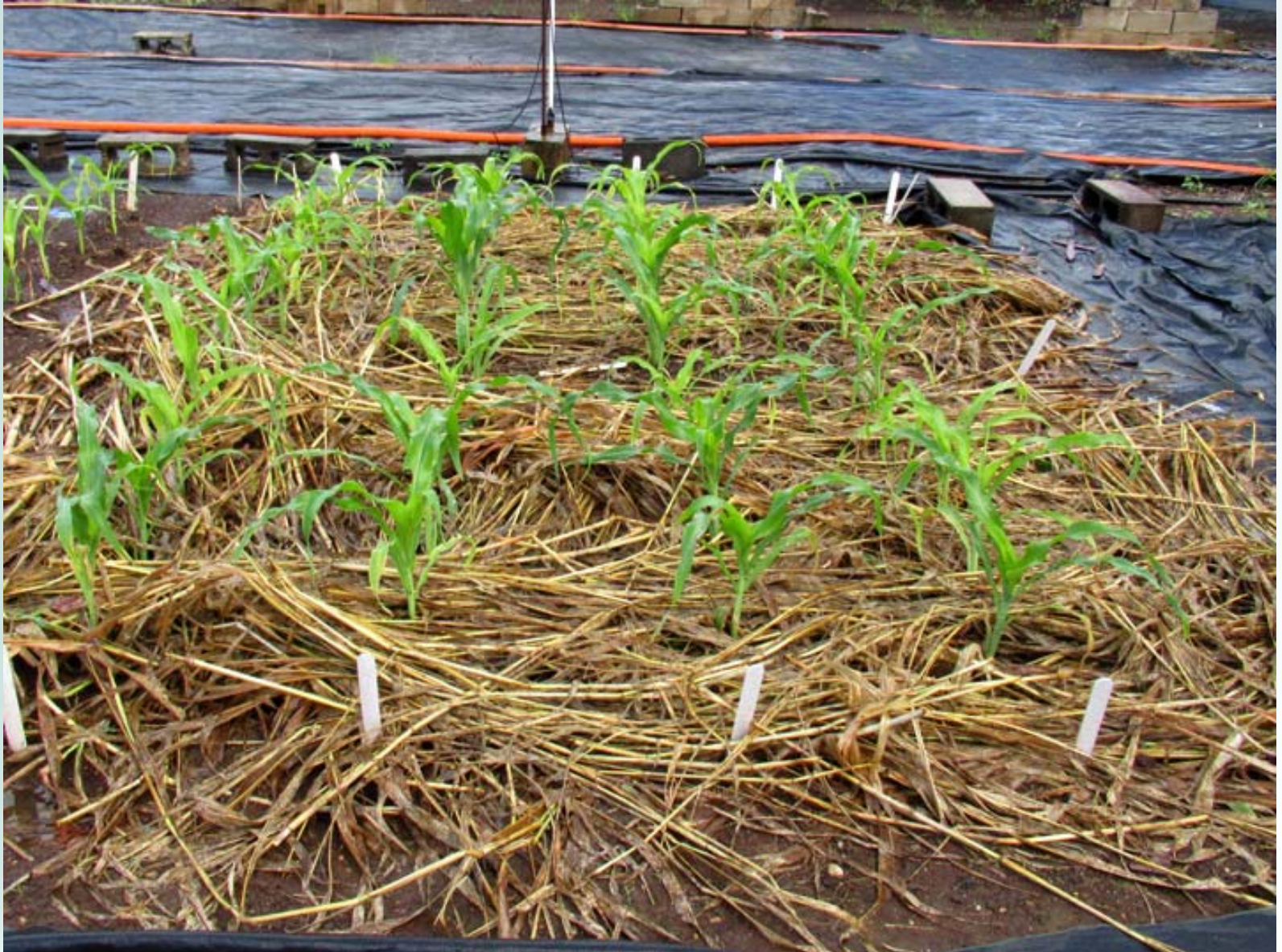


Mulch provides slow release of nutrients and weed suppression between crop rows.



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Sorghum mulch 2 weeks after planting



Sun hemp mulch 2 weeks after planting



No mulch 2 weeks after planting



Weeds in sorghum mulch production area.



Turn the page on living sorghum and weeds, expose sunhemp stumps with extra sorghum mulch.



Turn the page on living sorghum and weeds, expose sunhemp stumps with extra sorghum mulch.



Turn the page on living sorghum and weeds, expose sunhemp stumps with extra sorghum mulch. Water filled hose to secure weed mat



Weed free sun hemp stumps + sorghum mulch ready for more crops



Corn transplanted into sun hemp stumps and sorghum mulch



Turn the Page Farming - ideas for organic farming

- 1. Cover weeds to kill and prep fields for planting**
- 2. Kill weeds and cover crops = mulch for no till plantings**
- 3. Heavy mulch keeps down soil splash with overhead irrigation and rain**
- 4. Cover trap-crop after nematode penetration, kill both.**
- 5. Grants for large scale use of TTP**



Sprayer calibration for Home owner turf weed control

- 1. Setup application equipment that matches real-time sprayer delivery conditions**
- 2. Measure test area to be treated during calibration.**
- 3. Determine spray volume applied to test area.**
- 4. Convert volume applied to test area to volume applied to a 1000ft² area = standard home owner dimension for lawns.**
- 5. Identify amount of herbicide recommended in product label.**
- 6. Identify the volume of spray to be prepared for field use.**
- 7. Spray volume in tank = area to be treated**
- 8. Herbicide into tank = label recommended amount (units/1000 ft²)**





SEASON LONG WEED CONTROL

for **LAWNS** CONCENTRATE

KILLS & PREVENTS WEEDS UP TO 6 MONTHS*



MATA Y PREVIENE LAS MALEZAS hasta 6 MESES



**Won't Harm Lawns[†]
Rainproof in 1 Hour**

**KEEP OUT OF REACH OF CHILDREN
CAUTION**

See back panel for additional precautionary statements

[†]When used as directed; do not use on Carpetgrass, Floratam variety of St. Augustinegrass, Dichondra, or desirable clovers.

Not for sale, distribution or use in New York State.

Active Ingredient:
2,4-D, dimethylamine salt ... 4.73%
Boxaben ... 2.63%
Mecoprop-p potassium salt ... 1.10%
Dicamba, potassium salt ... 0.52%
Other Ingredients ... 91.02%
Total 100.00%
^{*}See weed list for 'Kills' & 'Prevents' weeds

Treats up to **9,000 Sq Ft**

**NET CONTENTS
29 FL OZ (857.6ml)**

USA 15296 1-529-8820

Sprayer calibration for home lawn broadleaf weed control

HOW MUCH TO USE

- Measure area to be sprayed. Calculate 'square feet' by multiplying length times width.
- For best results, use spray solution immediately. If it is necessary to store, shake vigorously before use. Do not store for more than 3 days.
- **Bermudagrass, Buffalograss, Fescue, Kentucky Bluegrass, Perennial Ryegrass, Zoysiagrass: 3.2 fl. oz. (6 1/2 TBS) in 2 gallons of water treats 500 sq. ft.**
- **Bahiagrass, Centipedegrass, St. Augustinegrass (not for use on improved varieties of St. Augustinegrass, such as Floratam) or mixtures containing one or more of these grasses: 1.6 fl. oz. (3 1/4 TBS) in 2 gallons of water treats 500 sq. ft.**
- Food utensils, such as tablespoons and measuring cups, must not be used for food purposes after use with any pesticide.
- The maximum application rate of this product is 6.4 fl. oz. per 1,000 sq. ft. per application per site. The maximum number of broadcast applications per treatment site is 2 per year.



Tropical Plant & Soil Sciences Department
University of Hawaii at Manoa

Hands on sprayer calibration exercise

1. Setup test area
2. Volunteer to spray test area
3. Determine volume to test area
4. Find calculator App on your smart phone
5. In class to do math using 5-step data sheet



For more information

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