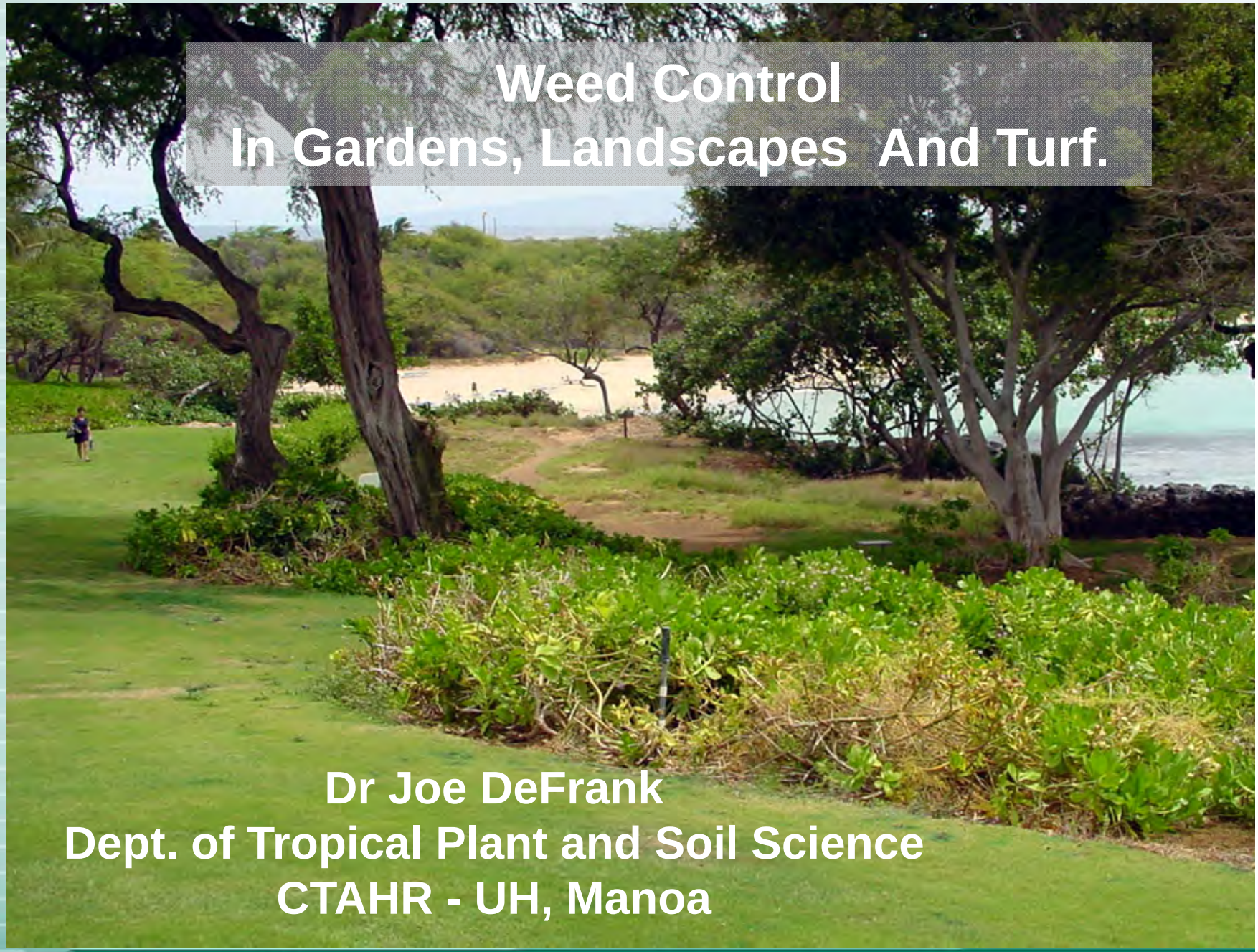
Weed Control
In Gardens, Landscapes And Turf.



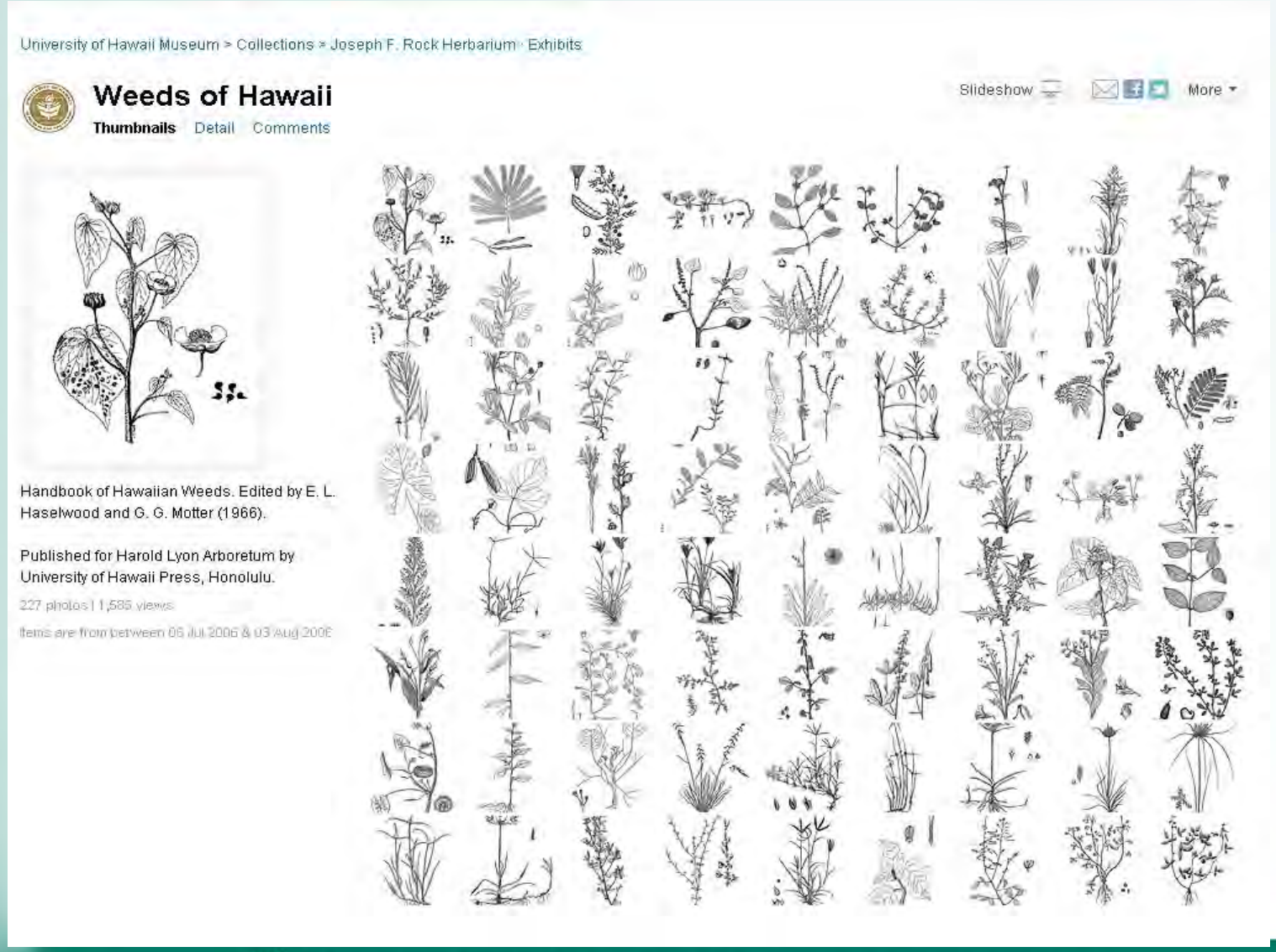
Dr Joe DeFrank
Dept. of Tropical Plant and Soil Science
CTAHR - UH, Manoa

Topics Covered

1. Web based resources for weed ID and control recommendations
2. Weed control in turf, considerations for maximum turf health
3. Problem weeds in turf.
4. Control of nutsedge in home gardens

Web resources for landscape weed control.
On-line Handbook of Hawaiian Weeds

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



Web resources for landscape weed control.

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

Cuscuta sandwichiana

DODDER

Description:
A slender twining parasite. Stems threadlike, leafless, usually yellowish or orange but sometimes tinged with red. Leaves reduced to minute scales. Flowers white, yellow, or orange, tiny, occur in massed clusters; calyx 5-lobed, cupped; corolla 5-lobed, 1/6 inch across, cut halfway down; stamens 5; styles 2, extended. Fruit a capsule, nearly spherical, 1/6 inch in diameter, indehiscent, 2-celled. Seeds 4, each 1/12 inch in diameter, brownish in color (20).

Propagation:
By seed and creeping stems.

Habitat:
Found in arid and moist regions at lower to middle elevations.

History:
Endemic to Hawaii.

Notes:
Declared noxious in Regulation 2. It attaches itself to other plants by suckers.

Comments and faves

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Web resources for landscape weed control.

Weeds of Hawaii Pastures

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

College of Tropical Agriculture and Human Resources

Weed Management in Hawai'i

for agriculture and conservation

HOME | NREM | CTAHR | UH

- 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 Phiilppine 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*, Shoebutton ardisia
- *Arthrostema ciliatum*, Arthrostema
- *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 landscape weed control.

Plants of Hawaii – by Forest & Kim Starr

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

Plants of Hawaii Search

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
Lahaina Pali Trail, Maui
December 09, 2002

Image# 021209-0006

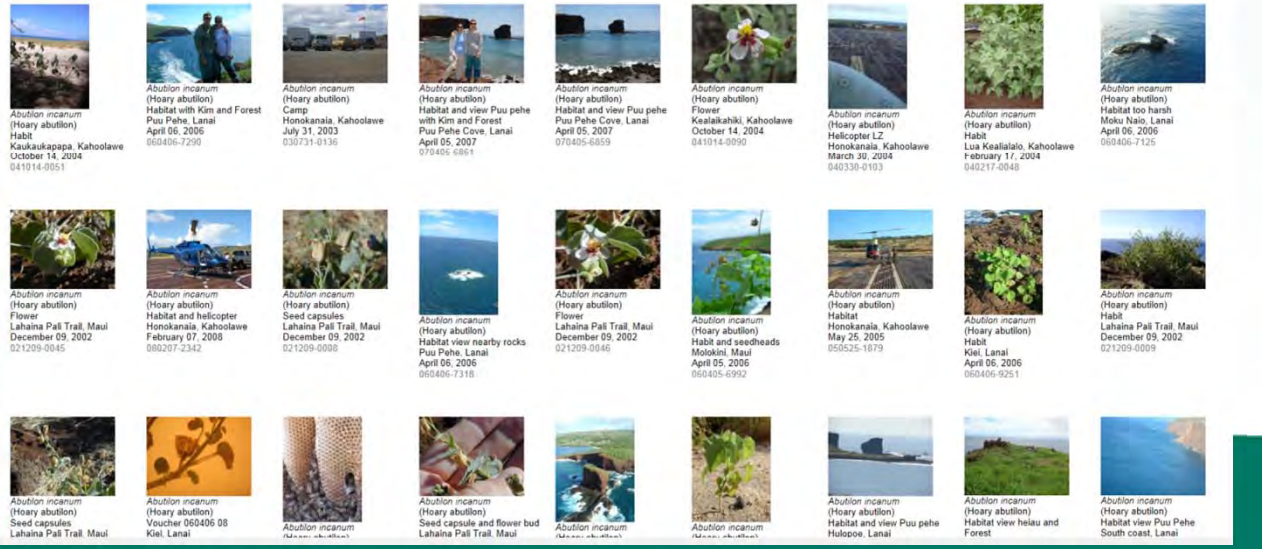
Abutilon incanum (hoary abutilon)
Seed capsules at Lahaina Pali Trail, Maui. December 09, 2002.

Plants of Hawaii Search

Home > Malvaceae > *Abutilon incanum* (hoary abutilon)

Native : Indigenous?

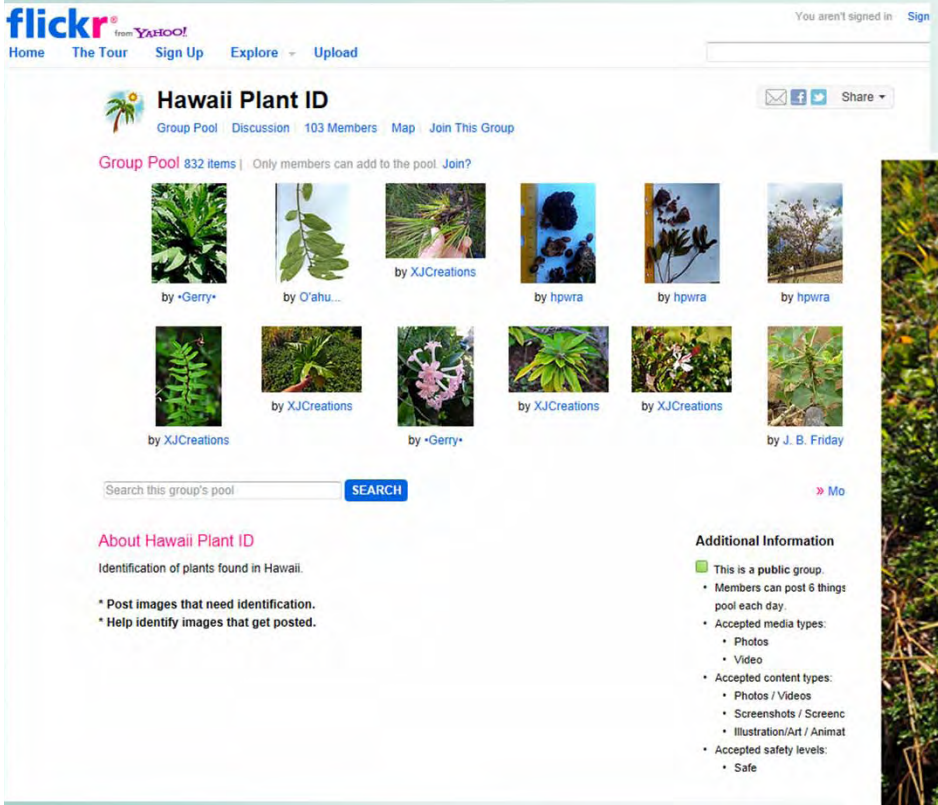
Sort by: View



Web resources for landscape weed control.

Hawaii Plant ID, join and submit photos, explore gallery

http://www.flickr.com/groups/hawaiiplantid/



ID

Pu'u Ulumawao

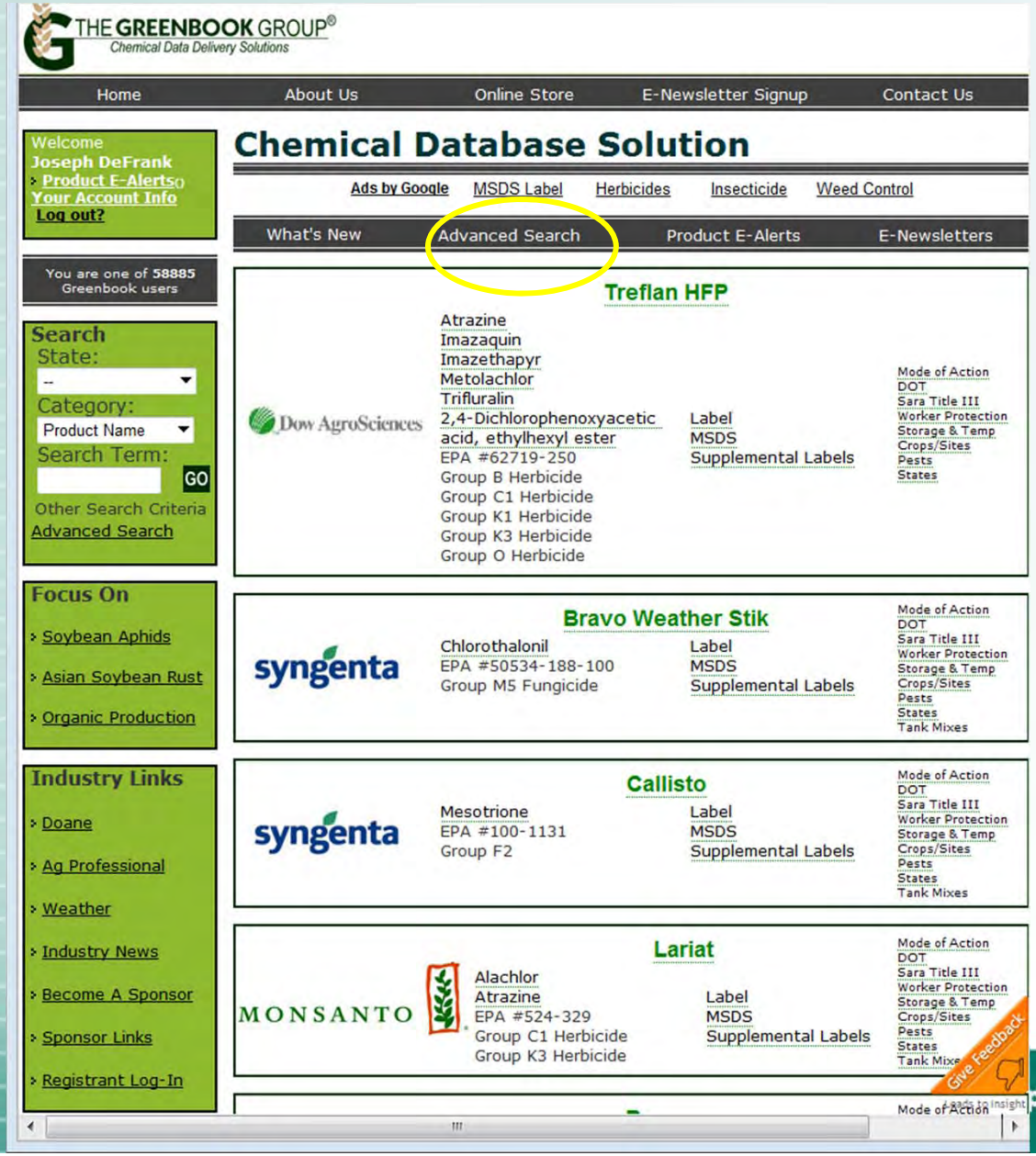
Comments and faves

Forest & Kim (7 days ago)
Looks like Morinda citrifolia (noni).
www.hear.org/starr/images/species/?q=morinda+ citrifolia&a...

Tropical Pl
University of H

Web resources for landscape weed control.

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



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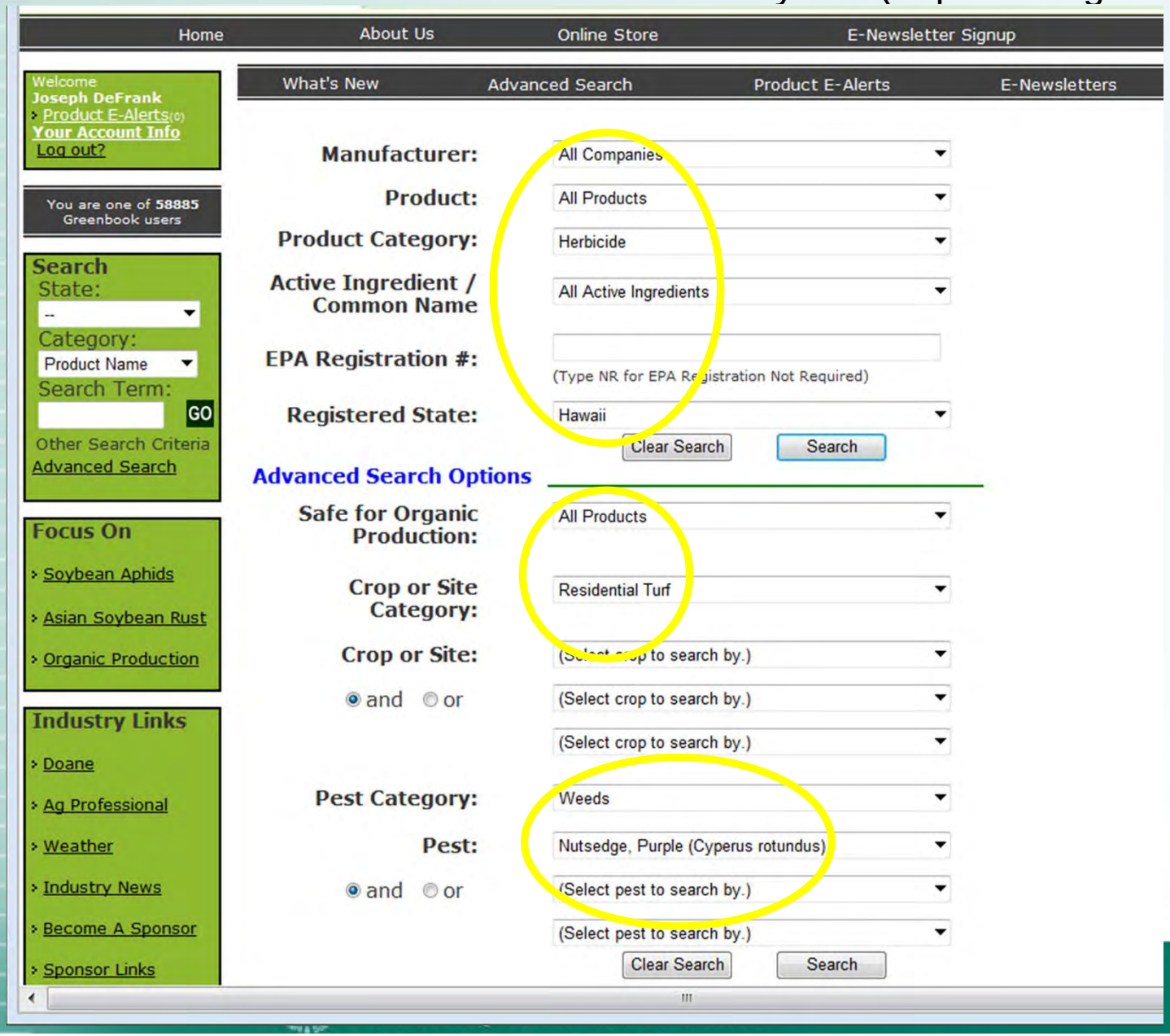

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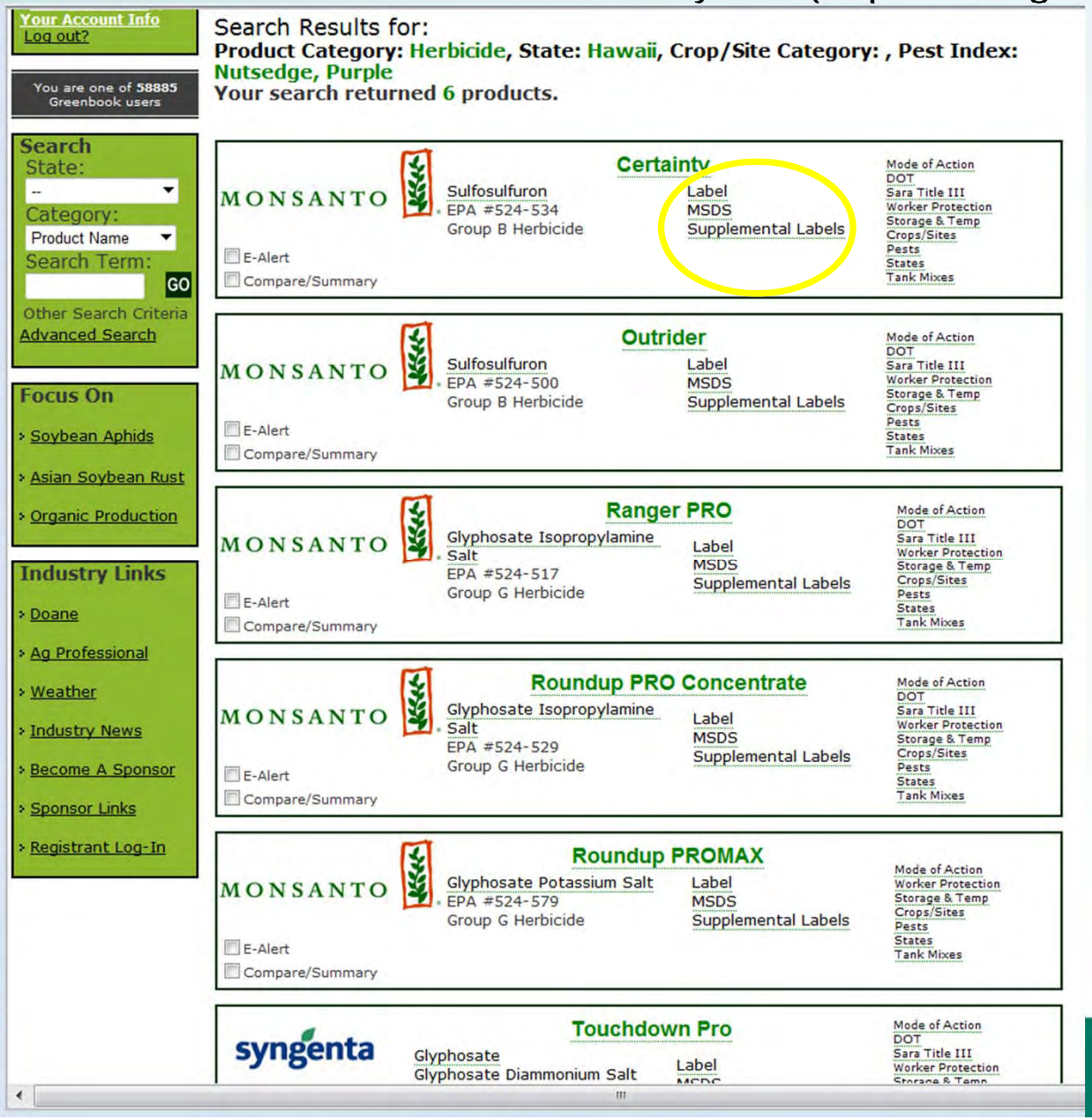

Web resources for landscape weed control.

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

Click on Label

Click on Supplemental Label

ATTENTION:

This specimen label is provided for general information only.

- This pesticide product may not yet be available or approved for sale or use in your area.
- It is your responsibility to follow all Federal, state and local laws and regulations regarding the use of pesticides.
- Before using any pesticide, be sure the intended use is approved in your state or locality.
- Your state or locality may require additional precautions and instructions for use of this product that are not included here.
- Monsanto does not guarantee the completeness or accuracy of this specimen label. The information found in this label may differ from the information found on the product label. You must have the EPA approved labeling with you at the time of use and must read and follow all label directions.
- You should not base any use of a similar product on the precautions, instructions for use or other information you find here.
- Always follow the precautions and instructions for use on the label of the pesticide you are using.

71016J7-6

Certainty® TURF HERBICIDE

CERTAINTY® TURF HERBICIDE IS A SELECTIVE HERBICIDE FOR CONTROL OF ANNUAL AND PERENNIAL GRASS AND BROADLEAF WEEDS IN HIGHLY MANAGED TURF, ORNAMENTAL AND NATIVE GRASS SITES.

Complete Directions For Use

EPA Reg. No. 524-534

2011-1

Read the entire label before using this product.

Use only according to label instructions.

Not all products recommended on this label are registered for use in California. Check the registration status of each product in California before using.

Read the "LIMIT OF WARRANTY AND LIABILITY" before buying or using. If terms are not acceptable, return at once unopened.

THIS IS AN END-USE PRODUCT. MONSANTO DOES NOT INTEND AND HAS NOT REGISTERED IT FOR REFORMULATION OR REPACKAGING.

1.0 INGREDIENTS

ACTIVE INGREDIENT:	
Sulfosulfuron	75.0%
OTHER INGREDIENTS:	25.0%
	100.0%

Certainty Turf herbicide is formulated as a water dispersible granule (WDG).

This product is protected by U.S. Patent No. 5,534,482. No license granted under any non U.S. Patent(s).

FIRST AID	
IF IN EYES	• Hold eye open and rinse slowly and gently with water for 15-20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eyes. • Call a poison control center or physician for treatment advice.

- Have the product container or label with you when calling a poison control center or physician, or going for treatment.
- In case of an emergency involving this product, Call Collect, day or night, **(314) 694-4000.**
- This product is identified as **Certainty Turf Herbicide, EPA Reg. No. 524-534.**

Personal Protective Equipment (PPE)

Applicators and other handlers must wear: long-sleeved shirt and long pants and shoes plus socks.

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

When handlers use closed systems or enclosed cabs in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240 (d) (4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

User Safety Recommendations

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

3.2 Environmental Hazards

This chemical demonstrates the properties and characteristics associated with chemicals detected in ground water. The use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in ground water contamination.

op Applications

t may be applied in established landscaped areas
er-the-top application on the ornamental and

Common Name	Scientific Name	Pre-Plant	Over-The-Top
Arborvitae, American	*Thuja occidentalis*		x
Azalea, Dwarf	*Rhododendron atlanticum*		x
Bougainvillea*	*Bougainvillea glabra*		x
Boxwood, Green Mountain	*Buxus* 'Green Mountain'	x	
Boxwood, Green Velvet	*Buxus* 'Green Velvet'	x	x
Burning Bush, Dwarf	*Euonymus alatus* 'Compacta'	x	
Euonymus, Wintercreeper	*Euonymus fortunei*	x	x
Forsythia	*Forsythia x intermedia*	x	
Gardenia	*Gardenia jasminoides*		x
Holly, Blue	*Ilex x meserveae*	x	x
Holly, Chinese	*Ilex cornuta*		x
Hydrangea, Panicled	*Hydrangea paniculata*	x	
Ivy, English	*Hedera helix*	x	
Japanese Snowball Bush	*Viburnum plicatum* var. *tomentosum*		x
Jasmine, Asiatic	*Trachelospermum asiaticum*		x
Jasmine, Star	*Trachelospermum jasminoides*		x
Jasmine, Winter	*Jasminium nudiflorum*	x	
Juniper, Chinese	*Juniperus chinensis*	x	x
Juniper, Creeping	*Juniperus horizontalis*	x	x
Juniper, Shore	*Juniperus conferta*		x
Lilac	*Syringa vulgaris*		x
Lilac, Dwarf Korean	*Syringa meyeri* 'Palibin'	x	
Mockorange, Japanese	*Pittosporum tobira*		x
Mondo Grass	*Ophiopogon japonicus*		x
Monkey Grass, Big Blue	*Liriope muscari* 'Big Blue'		x
Monkey Grass, Variegated	*Liriope muscari* 'Variegata'		x
Ninebark	*Physocarpus opulifolius*		x

Web resources for landscape weed control.

2012 North Carolina Ag. Chemical Manual http://ipm.ncsu.edu/Agchem/agchem.html

Placed on the Web by the Center for Integrated Pest Management, NCSU

2012 North Carolina Agricultural Chemicals Manual

College of Agriculture and Life Sciences
North Carolina State University

Table of Contents

Web resources for landscape weed control.

2012 North Carolina Ag. Chemical Manual http://ipm.ncsu.edu/Agchem/agchem.html

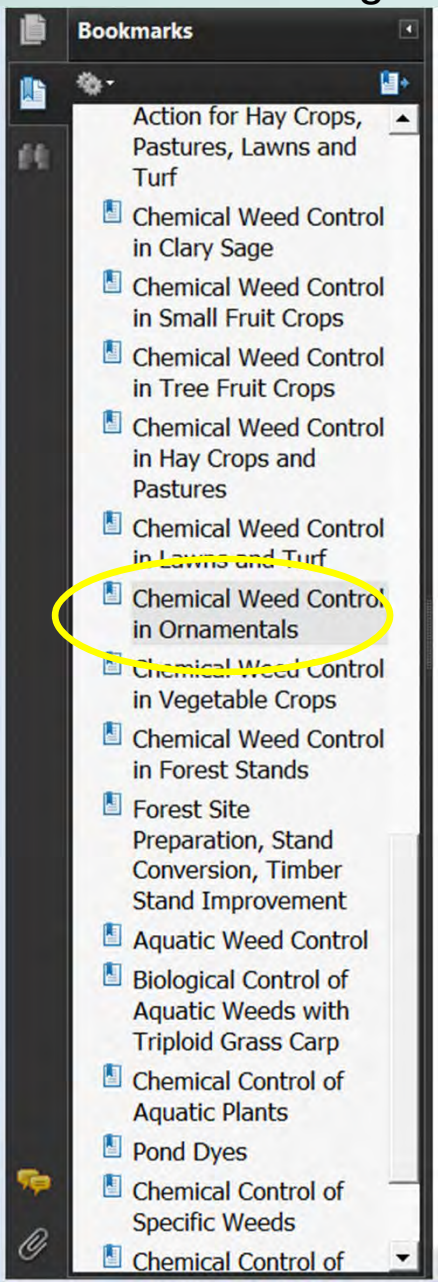

TABLE 7-16. CHEMICAL WEED CONTROL IN ORNAMENTALS

Weed	Herbicide and Formulation	Amount Formulation Per Acre	Pounds Active Ingredient Per Acre	Precautions and Remarks
Post-plant Preemergence Weed Control (continued)				
Annual grasses and broadleaf weeds (preemergence) See label for susceptible species (continued)	oxadiazon (Chipco Ronstar) 2 G	100 to 200 lb	2 to 4	Apply preemergence to weeds. Can be used on container- and field-grown ornamentals. Repeat applications are labeled for some species. Injury has been observed on ajuga, liriope, mondo, and fig (*Carica spp.*) Granules may burn tender foliage of several species if irrigation is not used to wash them off. Caution: Plants that trap granules in leaf axil can be injured.
	oxadiazon + pendimethalin (Jewel) 3.25 (2 + 1.25) G	100 lb	3.25	Apply preemergence to weeds. Can be used on container and field-grown ornamentals. Repeat applications are labeled. Check label for genera of plants on which it can be used. Do not apply to wet foliage.
	oxyfluorfen (Goal) 2 XL	5 to 10 pt	1 to 2	Preemergence and postemergence control of many broadleaf and grass weeds in conifers and dormant deciduous trees. Do not apply when conifers have young tender growth. Lower rates are used in conifer seedbeds and for postemergence treatments.
	(HGH 63) 2 G	12.5 to 100 lb	0.25 to 2	Preemergence weed control in field- and container-grown woody ornamentals. Use lower rates on conifer seedbeds, transplant beds, and newly potted liners. Up to 100 lb/acre may be used on larger and/or older plants. See label for specific species and guidelines.
	oxyfluorfen + oryzalin (Rout) 3 (2+1) G	100 lb	3 (2 + 1)	Apply preemergence to weeds. Can be used on container and field-grown ornamentals. Repeat applications are labeled. Check label for genera of plants on which it can be used.
	oxyfluorfen + oxadiazon (Regal OO) 3 (2 + 1) G	100 lb	3 (2 + 1)	Apply preemergence to weeds. May be used on container- or field-grown woody ornamentals, including liner production. Injury is to be expected to herbaceous plants or to plants with leaf orientation that might trap granules. Check label for genera of plants on which it can be used.
	oxyfluorfen + pendimethalin (Ornamental Herbicide 2) 3 (2+1) G	100 lb	3 (2 + 1)	Apply preemergence to weeds. Can be used on container- and field-grown ornamentals. Repeat applications are labeled. Check label for genera of plants on which it can be used.
	oxyfluorfen + trifluralin (HGH 75) 5 (2 + 3) G	100 lb	5 (2 + 3)	Preemergence control of annual grasses and broadleaf weeds in container- and field-grown woody ornamentals and landscape beds. Injury is to be expected to herbaceous ornamentals or plants with leaf orientation that might trap granules.
	pendimethalin (Corral, Pendulum) several formulations	See label	2 to 4	Preemergence control of annual grasses and some broadleaf weeds in turf, landscape plantings, container and field-grown nursery crops, and Christmas trees. Pendulum Aqua Cap is labeled only for turf and landscape uses. See labels for details.
	prodiamine (Barricade) 65 WG, 4 FL (Regalkade) 0.5 G	1 to 1.15 lb 21 to 48 oz 150 lb	0.65 to 0.75	Apply preemergence to weeds. Labeled for use in turf, landscape plantings, and nurseries. See label for tolerant species and restrictions.
	pronamide (Kerb) 50 WP	2 to 4 lb	1 to 2	Pre and postemergence control of cool-season grasses and some annual broadleaf weeds from seed. Apply in late winter just before rain or snowfall. Not recommended for soils that are high in muck or peat. Check label for use restrictions.
	simazine (Princep) 4 L	2 to 3 qt	2 to 3	Apply preemergence to weeds in field nurseries and Christmas trees. Injury has occurred on azaleas, Japanese holly, euonymus, lilac, privet, pittosporum, mock orange, hemlock, boxwood, and several other broadleaf species. High rates will injure Fraser fir.
	trifluralin (Preen) 1.47G (Treflan) 5 G	136 to 272 lb 80 lb	2 to 4 4	Preemergence to weeds. Irrigate after application. May injure some azalea cultivars.
Post-Plant, Postemergence Selective Grass Control				
Annual and perennial grasses (postemergence) See label for tolerant species	clethodim (Envoy)	8 to 34 fl oz	0.06 to 0.25	Postemergent grass control. Annuals 2 to 6 in. tall, perennials at 4 to 12 in. new growth. Add nonionic surfactant at 0.25% v/v (2 pt per 100 gal) to final spray.
	fenoxaprop-P (Acclaim Extra) .57EC	13 to 39 oz	0.06 to 0.17	Apply to emerged grass using at least 40 gpa. Can be used overtop of many flowers and woody ornamentals. Check label. Injury has been observed on Bar Harbor juniper, philodendron, Salvia, Podocarpus, and Pittosporum when sprayed with this product.
	fluazifop-P (Fusilade II) 2 EC	2 to 3 pt	0.25 to 0.4	Postemergence grass control. Annuals not over 2 to 8 in. tall, perennials at 4 to 12 in. new growth. Consult label for tolerant species. Use nonionic surfactant and no oil.

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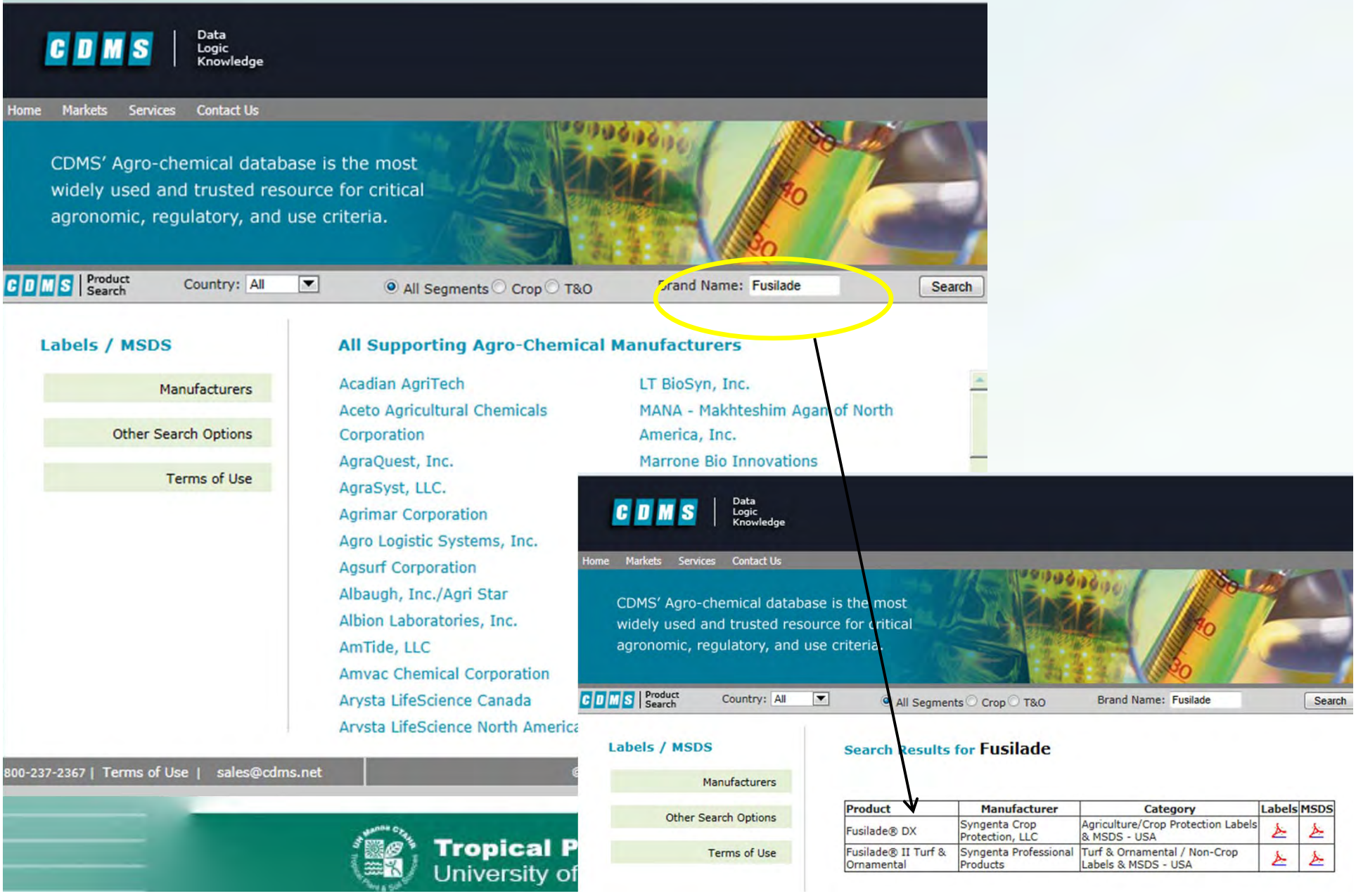
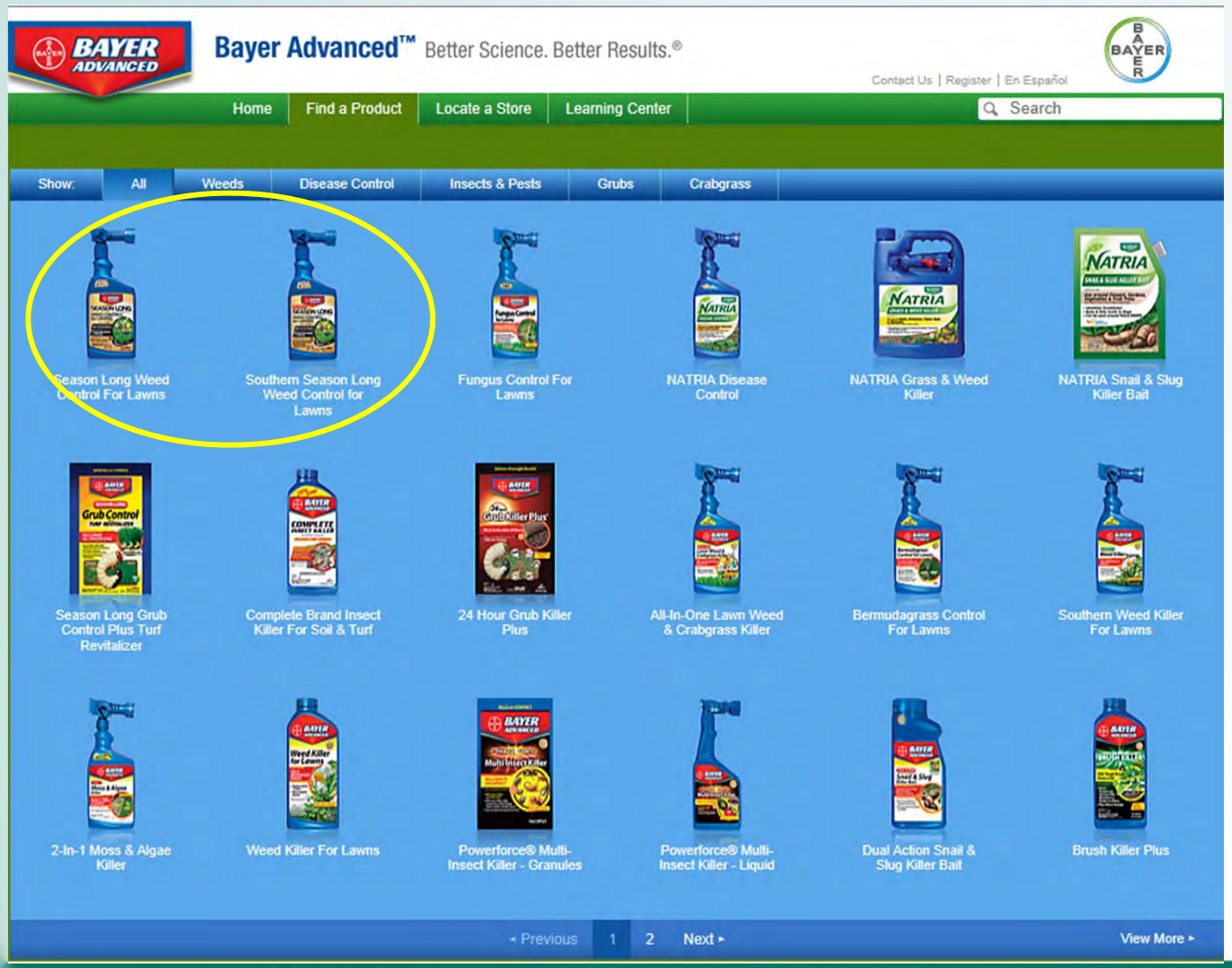
Web resources for landscape weed control.

CDMS Agro-Chen Data Base http://www.cdms.net/Home.aspx



Web resources for landscape weed control.

Bayer Advanced – products for homeowners (http://www.bayeradvanced.com/lawn-care/products)



Factors for a healthy lawn

A healthy lawn is the best form of weed control

Automated irrigation essential to a healthy lawn

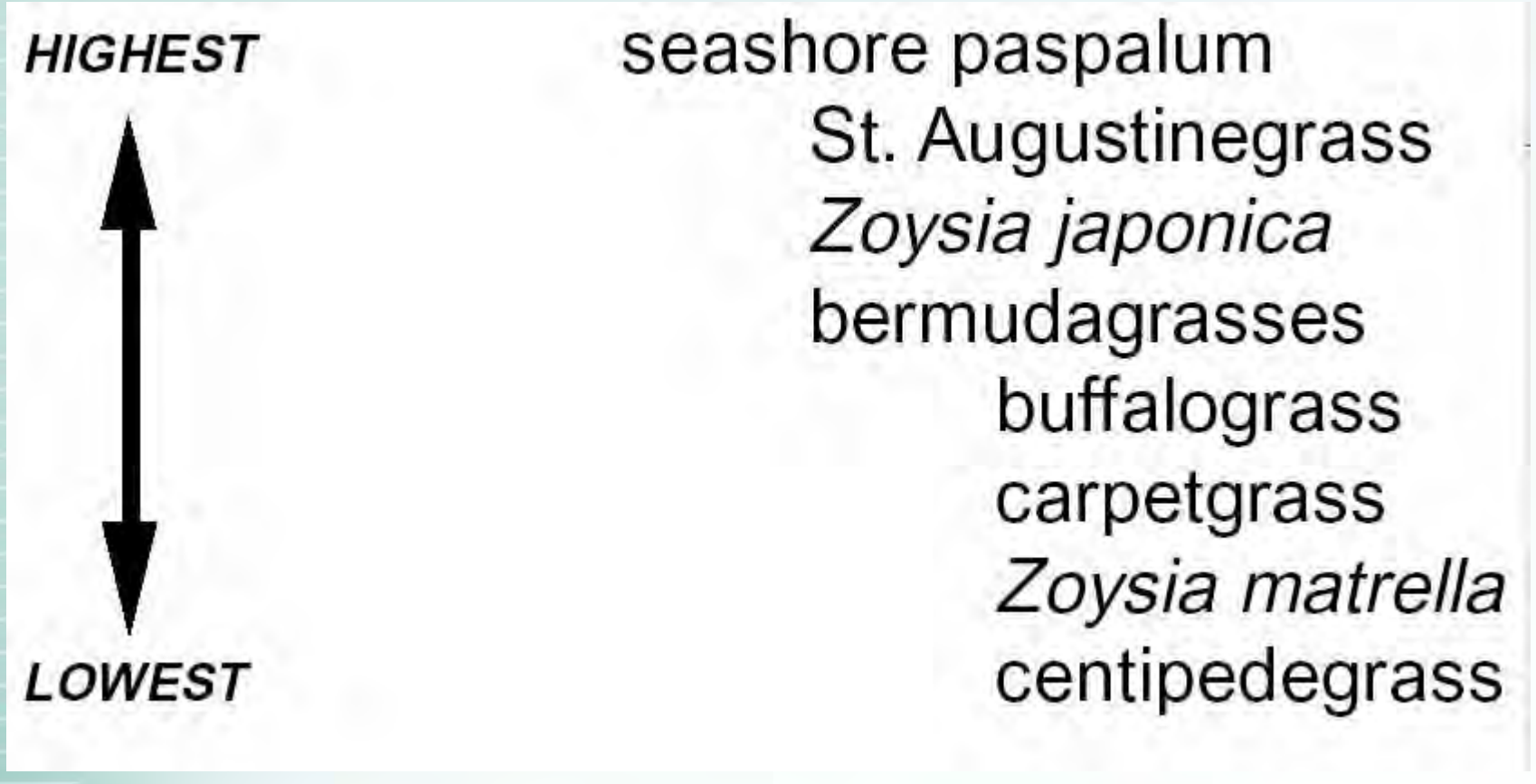
Factors for a healthy lawn

Proper growth:

- **Water - automated, amount, coverage**
- **Water quality - salty or fresh**
- **Light - full sun vs shade**
- **Wear tolerance - compaction**

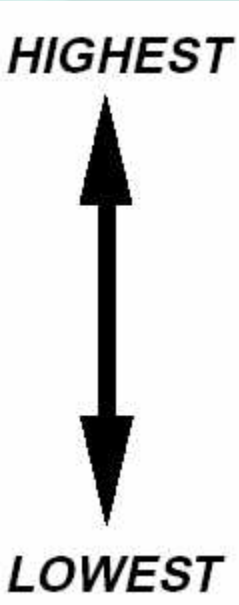
Factors for a healthy lawn

WATER QUALITY - SALTY OR FRESH



Factors for a healthy lawn

LIGHT - FULL SUN VS SHADE



St. Augustinegrass
zoysiagrasses
carpetgrassss
centipedegrass
seashore paspalum
bermudagrasses
buffalograss

PROBLEM BROADLEAF WEEDS

Legumes :creeping indigo, desmodiums, clovers

Spurges: prostrate, garden and graceful

Misc brd lf.: Amaranths, ground ivy, oxalis

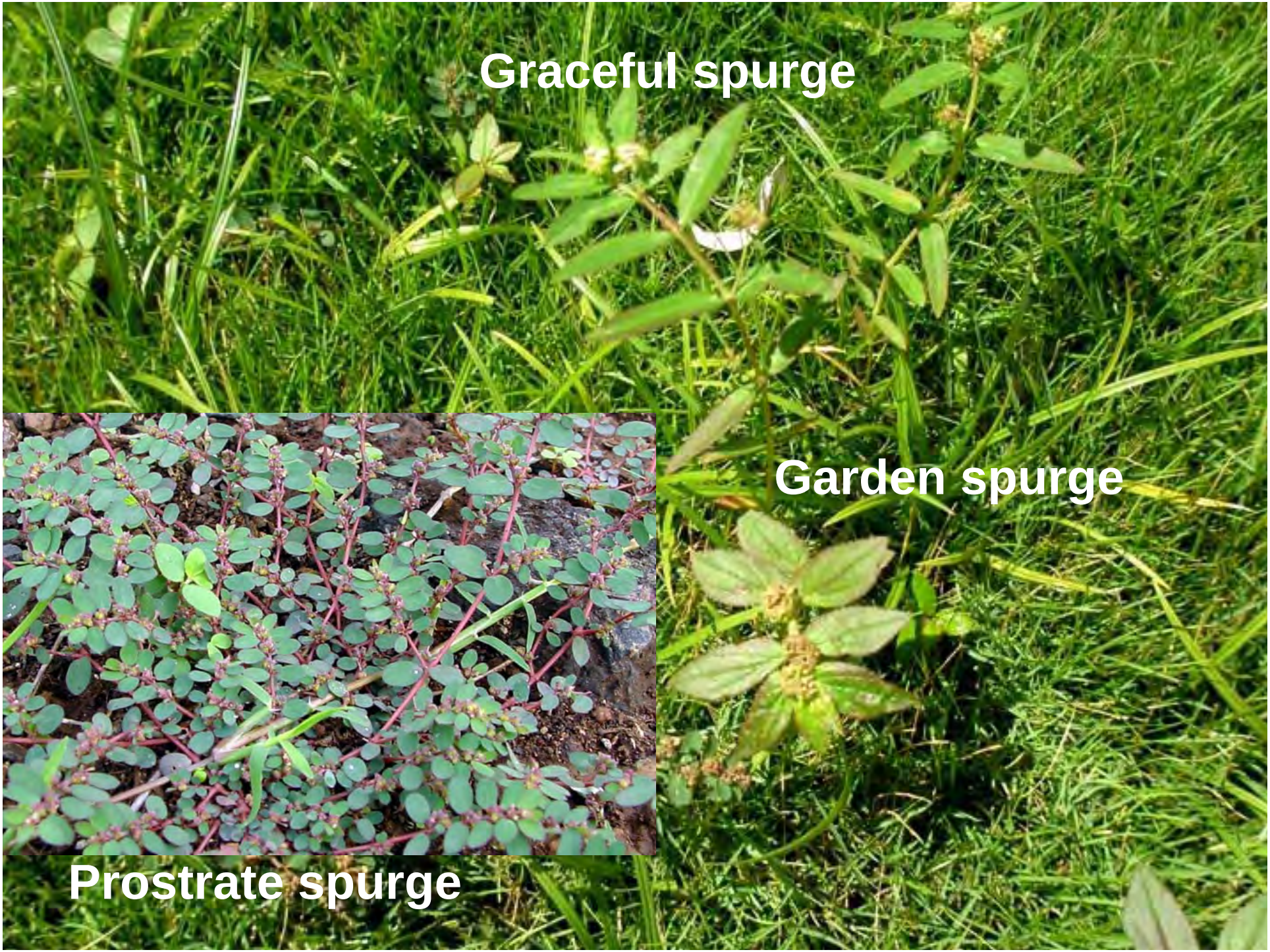

Creeping indigo


Desmodium triflorum – beggar weed


Button weed


Khaki weed


Ground ivy


Graceful spurge
Garden spurge
Prostrate spurge

Sprawling Horse Weed

Tropical Plant & Soil Sciences Department
University of Hawaii at Manoa

Commonly used Postemergence Broadleaf herbicides

Trimec Southern

- Mixture of 3 herbicides, no MSMA
- Use on Bermuda, zoysia grass, St. Aug. & Centipedegass
- Seashore paspalum not on label

Commonly used Postemergence Broadleaf herbicides

SpeedZone

- Mixture of 4 herbicides, no MSMA
- Common and hybrid Bermuda and zoysia grass
- Seashore paspalum not on label
- Adds carfentrazone to Trimec for faster activity

Commonly used Postemergence Broadleaf herbicides

SpeedZone Southern

- **Mixture of 4 herbicides, less 2,4-D for reduced injury to warm season turf**
- **Common and hybrid Bermuda, zoysia grass, Centipede, Kikuyugrass, Seashore paspalum and St. Aug. (see label for excluded cultivars)**

Commonly used Postemergence Broadleaf herbicides

Confront

- Mixture of 2 herbicides, trade names of Lontrel and Turflon
- Use on Bermuda, zoysia grass and centipedegrass
- Seashore paspalum not on label
- User can determine suitability for species not on label
- Good activity on legume type weeds
- Dichondra, a legumenous plant, is tolerant

Commonly used Postemergence Broadleaf herbicides

Manor

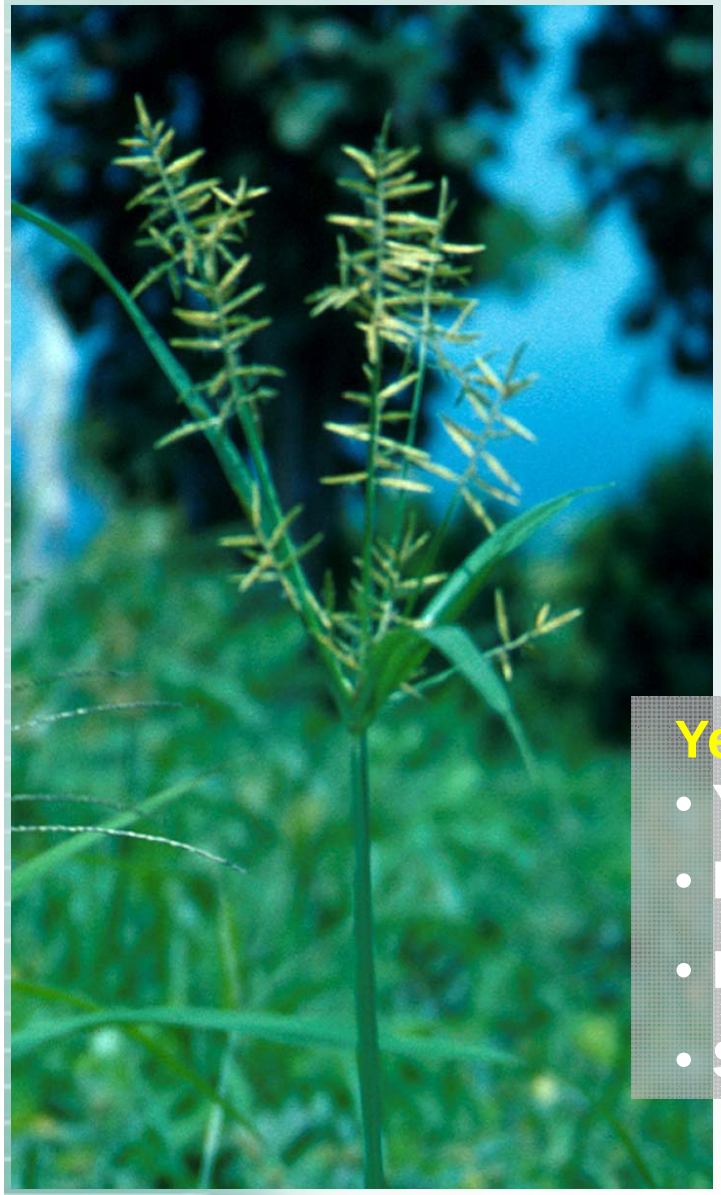
- Single product
- Use on Bermuda, St. Aug., zoysia grass and centipedegrass
- Seashore paspalum not on label
- Very good activity on spurges
- Controls Bahiagrass, a paspalum species related to Seashore

Sedge Weeds in Hawaiian Landscapes

Purple nutsedge
Yellow nutsedge
Green Kyllinga
White Kyllinga

Purple Nutsedge

- Brown narrow spikes in flower head
- Tubers in chains
- Seed not viable
- Spreads by vegetative parts = tubers



PURPLE NUTSEDGE

Yellow Nutsedge

- Yellowish-Brown or straw colored flower head
- Round tubers at the end of rhizomes, sweet
- Does not form chains, seed not viable
- Spreads by vegetative parts= tubers

White Kyllinga

- White single round flower heads
- No tubers
- spreads by seed and underground stems


White kyllinga

Green Kyllinga

- Green single round/oval flower heads
- No tubers
- Spreads by seed and underground stems


Green kyllinga


INCHES
VAN WATERS & ROGERS
METRIC


Eleocharis spp.

Commonly used herbicides for selective sedge control in turf

Manage/Sedgehammer/Sedge Pro

Certainty

Monument

Commonly used Postemergence Sedge herbicides

Manage/SedgeHammer/SP

- Single product
- Use on Bermuda, St. Aug., zoysia grass, centipede grass, Seashore paspalum and Kikuyugrass
- Primarily used for purple nutsedge
- Less effective on Kyllingas
- Little to no injury on turf

Commonly used Postemergence Sedge herbicides

Certainty

- Single product, very low use rate .25 – 2.0 dry oz/a
- Use on Bermuda, St. Aug., zoysia grass, centipedegrass, Seashore paspalum and Kikuyugrass
- Used for purple nutsedge and Kyllingas
- Controls some selected /grass & broadleaf weeds (Wth. Clover, Crowfoot Grass, Ground Ivy, Dandelion)
- Little to no injury on turf
- Root absorbed, citrus very sensitive be aware of tree roots

Commonly used Postemergence Sedge herbicides

Monument

- Single product
- Use on Bermuda and zoysia grass
- Controls sedges and selected grass and broadleaf weeds
- Suppression of Crab, Dallis and Torpedograss
- Controlls Creeping Indigo, Khakiweed and Black medic

Controlling Purple Nutsedge In a Garden or Ornamental Bed Setting

Mechanical

Chemical

IPM approach makes use of water, weed mat and time

Biology of Purple nutsedge

- Seeds – Very few, not often source of new plants
- Underground tubers and corms are the primary source of infestation
- Undisturbed, spreads 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 from Infested soil, plants & sods.
- Movement on equipment

Nutsedge persistence

- **Dormancy of tubers prevents complete emergence of all plants**
- **Dormancy allows constant/staggered emergence when conditions are right**

    a) moisture, heat, open soil


Purple nutsedge
Nutsedge persistence

Strategies for purple nutsedge control

Preplant mechanical cultivation

1. In very dry soil, tubers on soil surface 10-12 days will die
2. Sequential cycles of plowing and disking to bring tubers to the surface to dry and die will lower soil population of tubers

Strategies for purple nutsedge control

Chemical weed control

1. Prepare seedbed
2. Irrigate to allow NS to germinate and grow
3. At proper stage of grow treat with systemic herbicides
4. Must see flower heads for maximum translocation of systemic herbicides to underground storage organs

SYSTEMIIC HERBICDES MOST EFFECTIVE AT THIS STAGE OF GROWTH

Chemical control of nutsedge in ornamental plants and landscapes

Topical application of Roundup for selective weed control

- Roundup Ultra 43% conc..
- 5-10 % solution
- Add color and apply to leaves
- Rubber glove covered with cotton glove
- Paint leaves with special tools

Wiper in non-crop areas and for tall weeds in turf

Strategies for purple nutsedge control in gardens and ornamental beds

IPM approach

1. Make use of knowledge of growth habit
2. Deep soil heating for maximum germination
3. Use light exclusion for slow kill off
4. Prevent reinfestation with mulches and close plantings

Solarization

1. Involves use of clear plastic and irrigation

2. Deep soil heating stimulates tuber bud break and shoot emergence

3. Increased bud break makes more tubers susceptible to chemical kill

   a) Maximum kill with Roundup possible

   b) Nutsedge must be 4-6 weeks old with flowers showing

      (1) Spray before this age only burns off tops

      (2) When flower show plant can move chemical to underground portions = metabolic sinks


TWO
WEEKS

Preplant irrigation on soil covered with ground cover fabric

1. Weed cloth held loosely to soil surface
2. Nutsedge grows rapidly and snags in weave
3. 2-3 months tubers exhausted
4. Irrigation with drip under fabric important to maximize emergence

USE PINS TO LOOSELY SECURE FABRIC TO SOIL

NO ROCK OR SOIL ON PLASTIC

Tropical Plant
University of Hawa

Maximizing flush of nutsedge tubers for more complete purging from the soil

- Prepare site for 3-4 months before planting
- Compost, nutrients, tilling and irrigation
- Cover with clear plastic for 2-3 weeks-full sun, good soil moisture needed for deep heating
- Remover clear and cover with black woven weed mat
- Secure without making holes, water filled hose
- Maintain good moisture levels under weed mat
- Allow multiple weed flushes, see mat rise and fall
- Remove weed mat, apply mulch layer
- Plant seeds or transplants, minimize open space

Aggressive plant competition to slow return of high nutsedge levels

1. **Nutsedge thrives when other plants are removed**
2. **Healthy well maintained lawn best control of nutsedge**
3. **Heavy shade prevents nutsedge proliferation**

For more information

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HI Weed ID:
http://www.ctahr.hawaii.edu/deFrankJ/index.htm