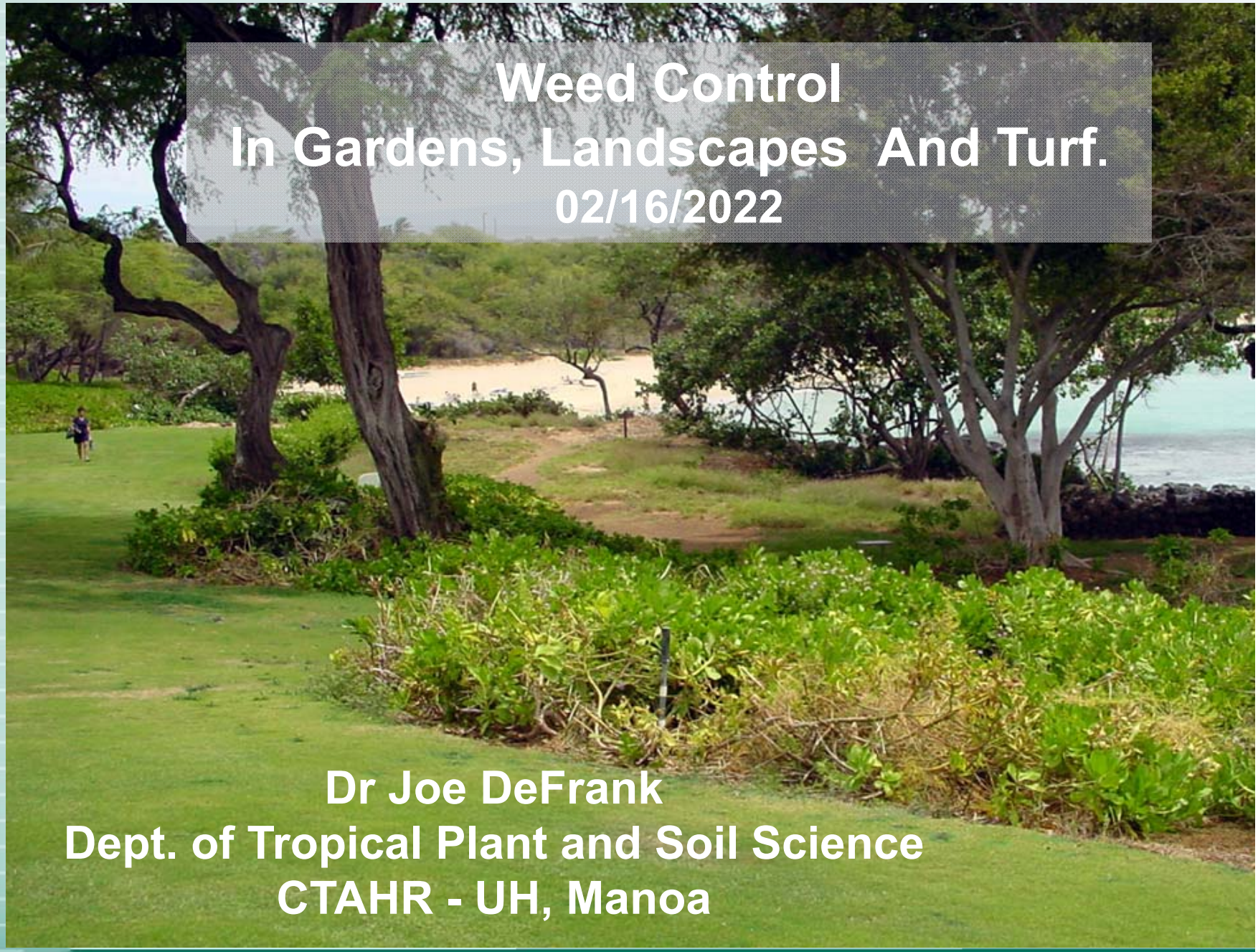


# Weed Control
# In Gardens, Landscapes And Turf.
## 02/16/2022


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

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

https://scholarspace.manoa.hawaii.edu/handle/10125/6806 - download pdf of entire book

# Web resources for landscape weed control.

https://scholarspace.manoa.hawaii.edu/handle/10125/6806 - download pdf of entire book

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 (1 1, 15).

Propagation:
By seed.

Habitat:
A weed in wastelands.

History:
Native to southern Asia and Mascarene Islands.

# Web resources for 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 weed control.

## Plants of Hawaii – by Forest & Kim Starr

## URL: http://www.starrenvironmental.com/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 cat | |
| *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

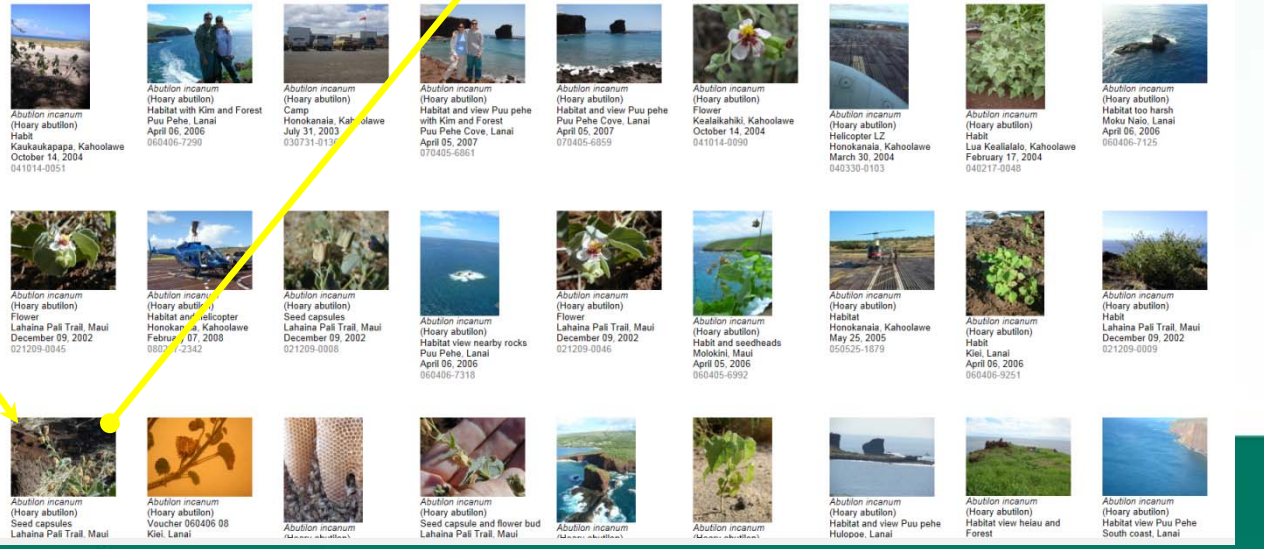
*Abutilon incanum* (hoary abutilon)
Seed capsules at Lahaina Pali Trail, Maui. December 09, 2002.

**Plants of Hawaii** Search

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

Native : Indigenous?

Sort by: View



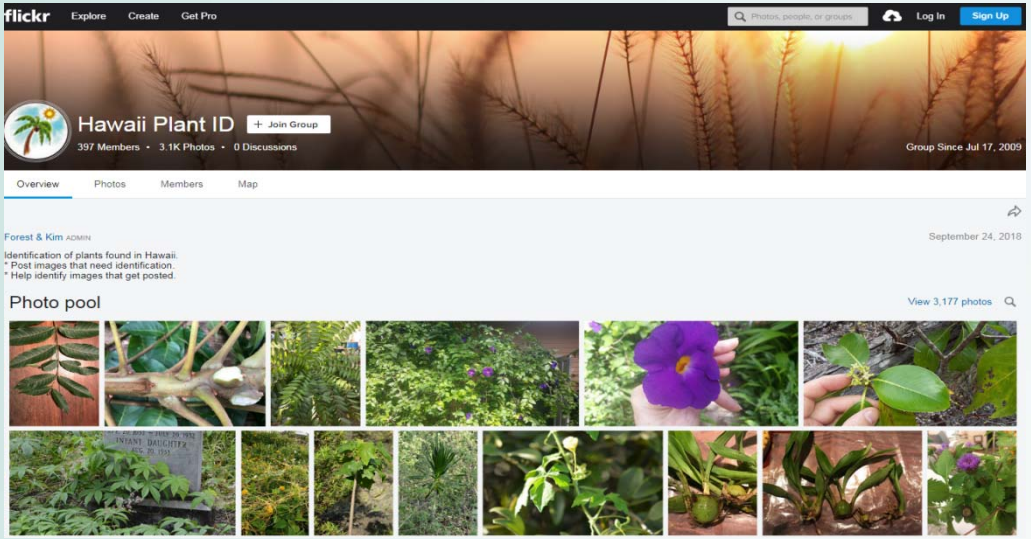
# Web resources for weed control.

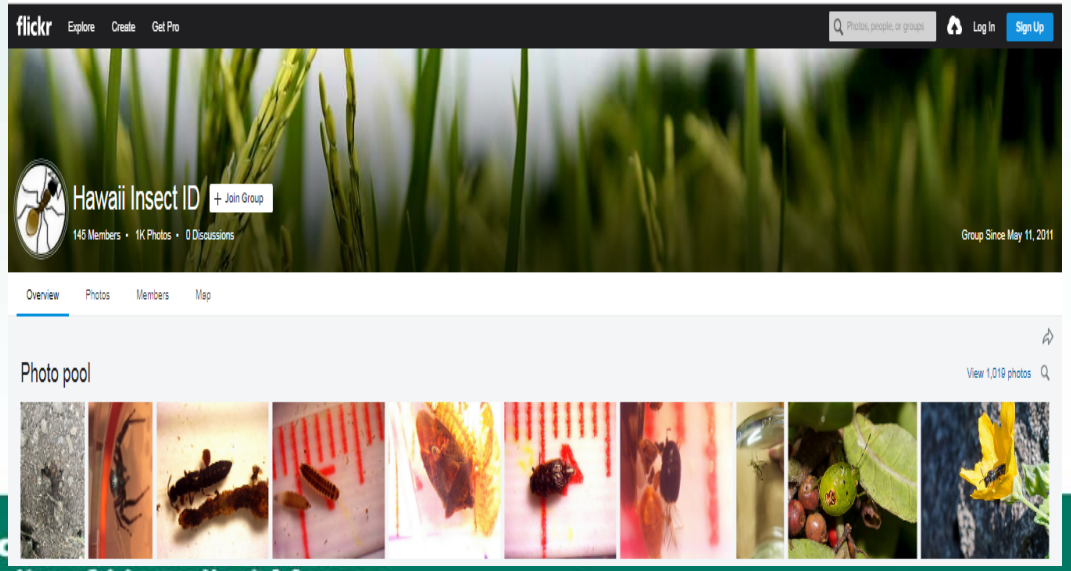
## Hawaii Plant & Insect ID, join and submit photos, explore gallery

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

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

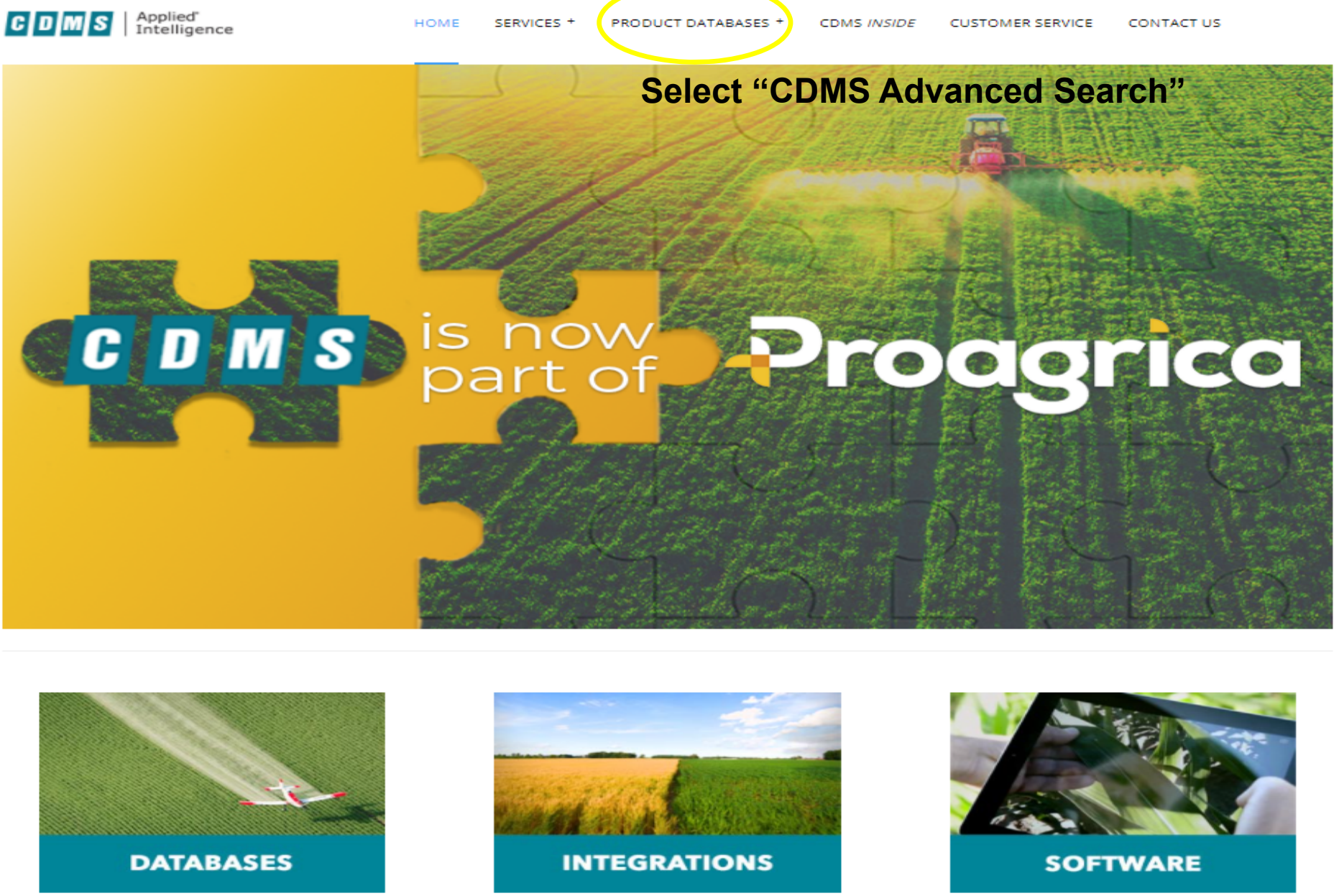
**Free to join and submit images for ID**



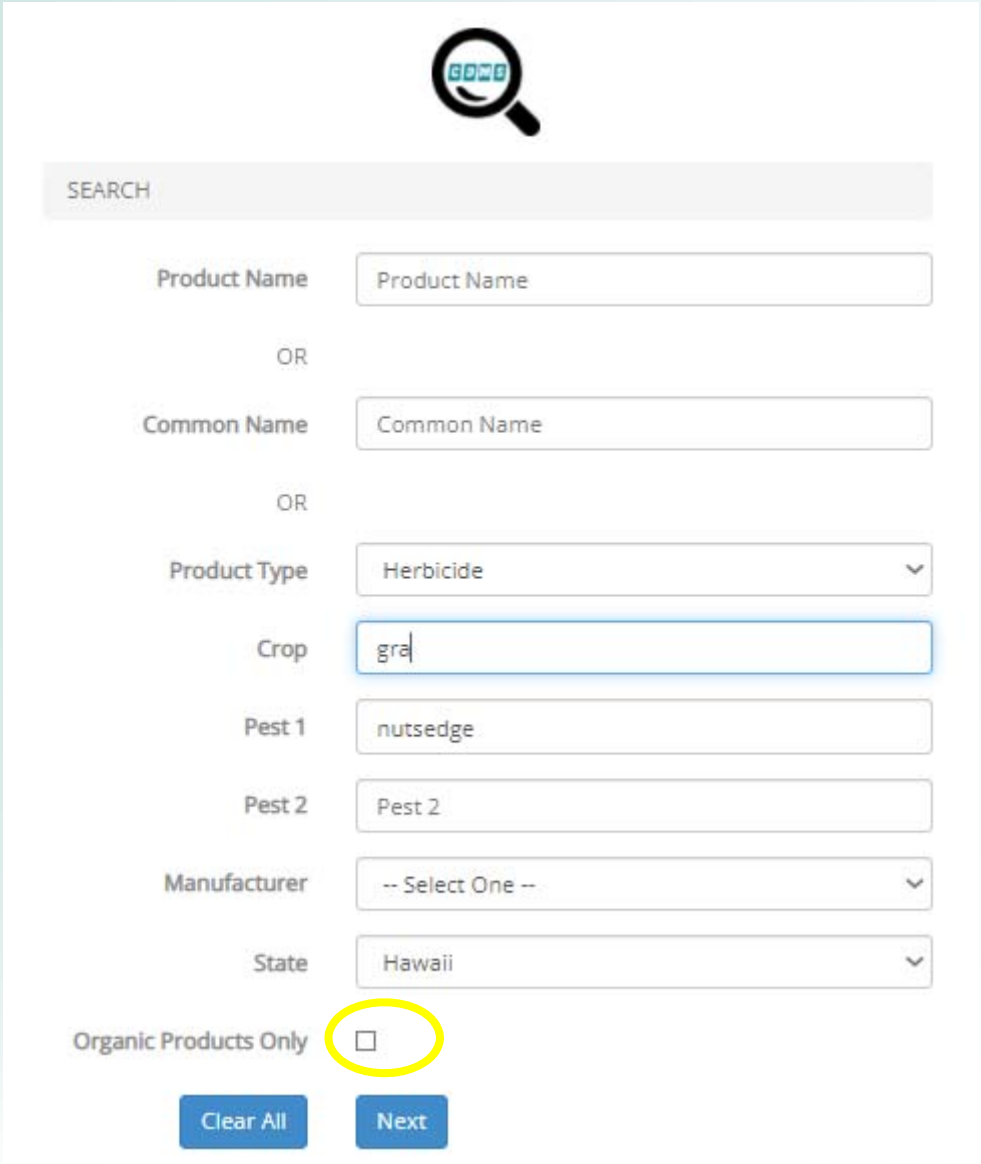
**Web resources for landscape weed control.**

CDMS-easy location of pesticide labels - http://www.cdms.net/



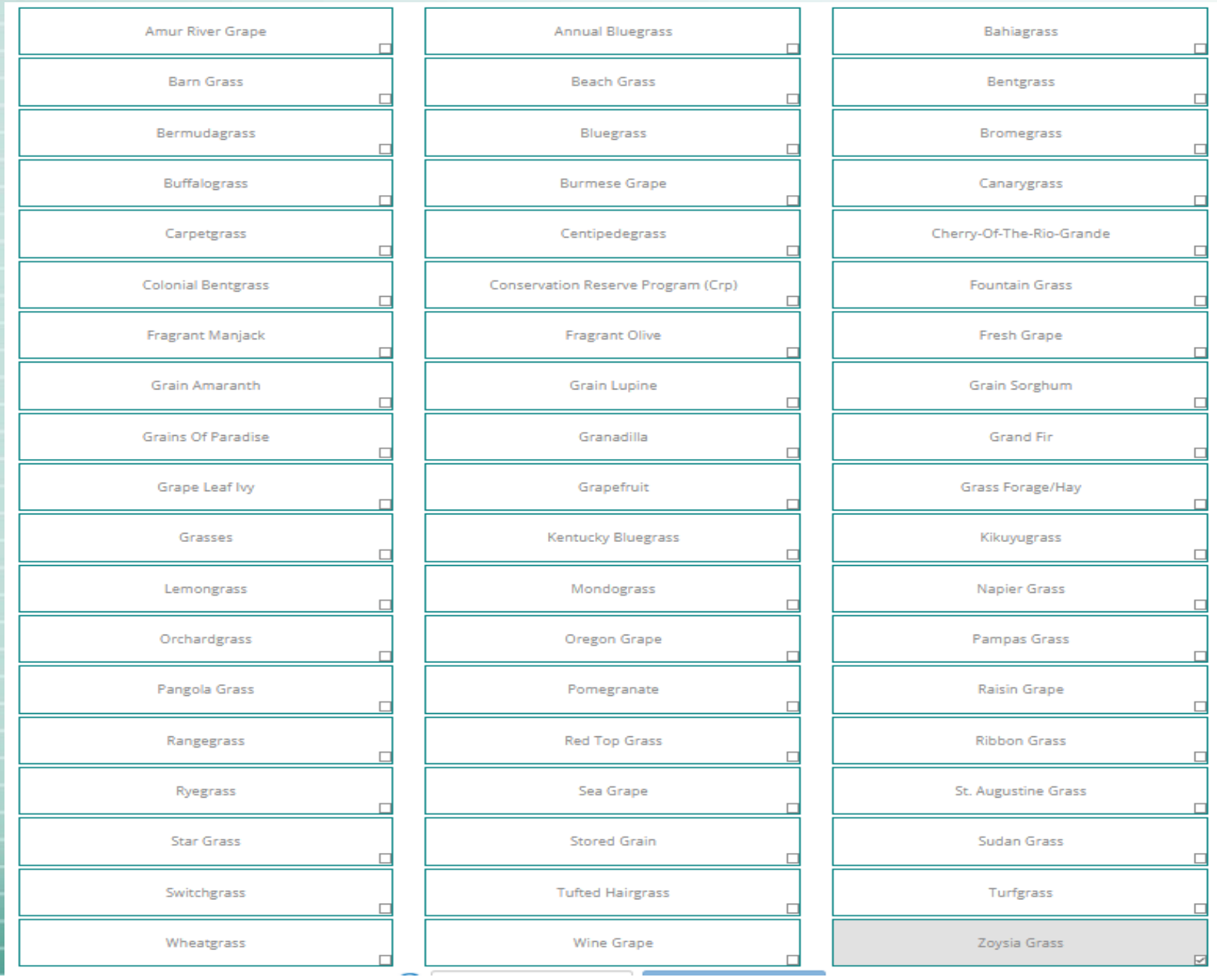
# Web resources for landscape weed control.

CDMS Adv. Search - http://www.cdms.net/Label-Database/Advanced-Search



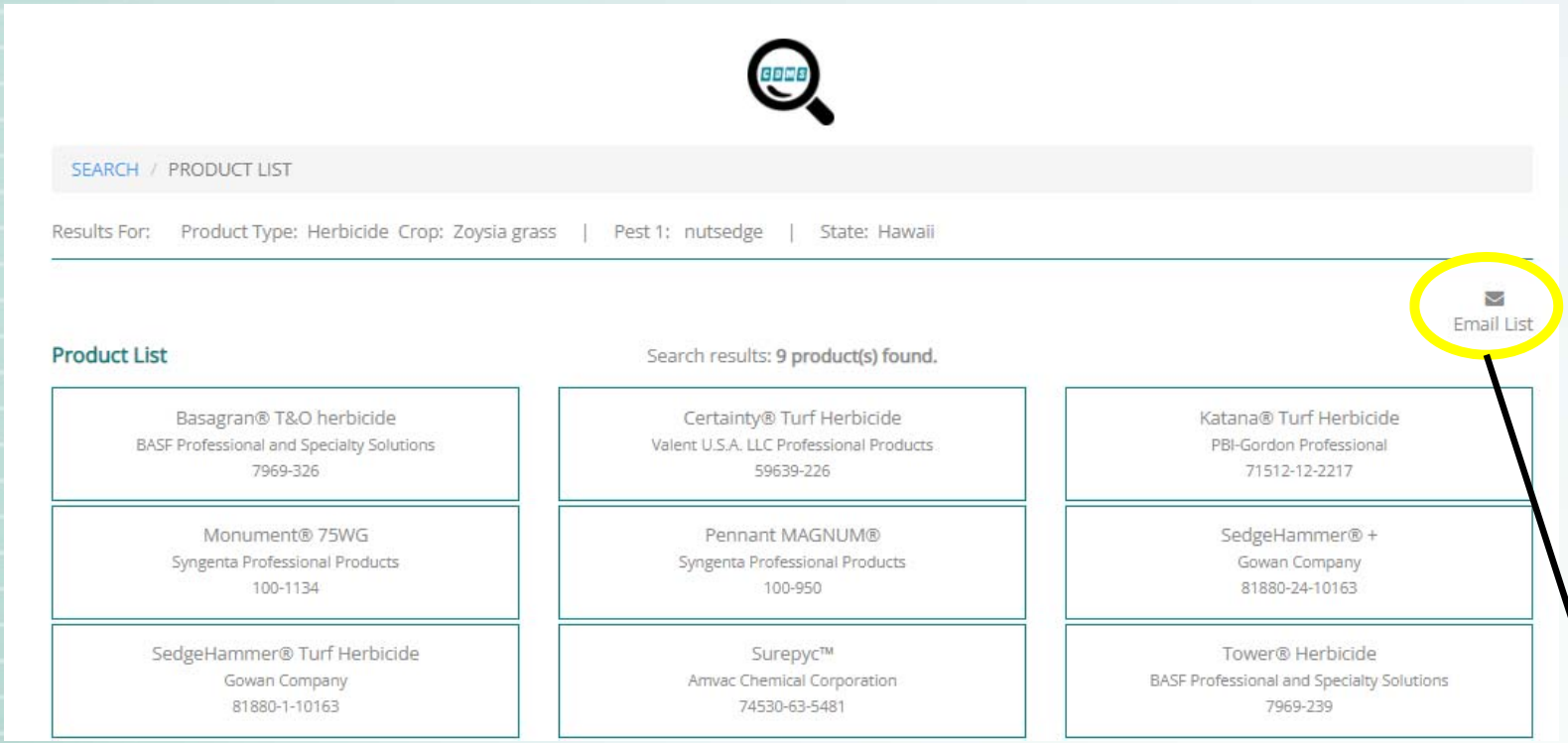
# Web resources for landscape weed control.

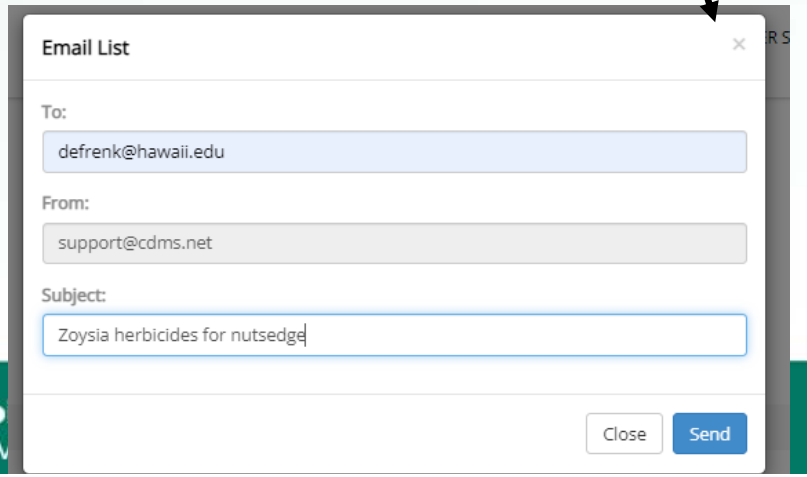
CDMS-easy location of pesticide labels - http://www.cdms.net/



# Web resources for landscape weed control.

CDMS-easy location of pesticide labels - http://www.cdms.net/



# Web resources for landscape weed control.

CDMS-easy location of pesticide labels - http://www.cdms.net/

Search results can be sent to an email address

Zoysia herbicides for nutsedge (11/16/2021) External Inbox ×

**upport@cdms.net**

2:06 PM (0 minutes ago)

to me

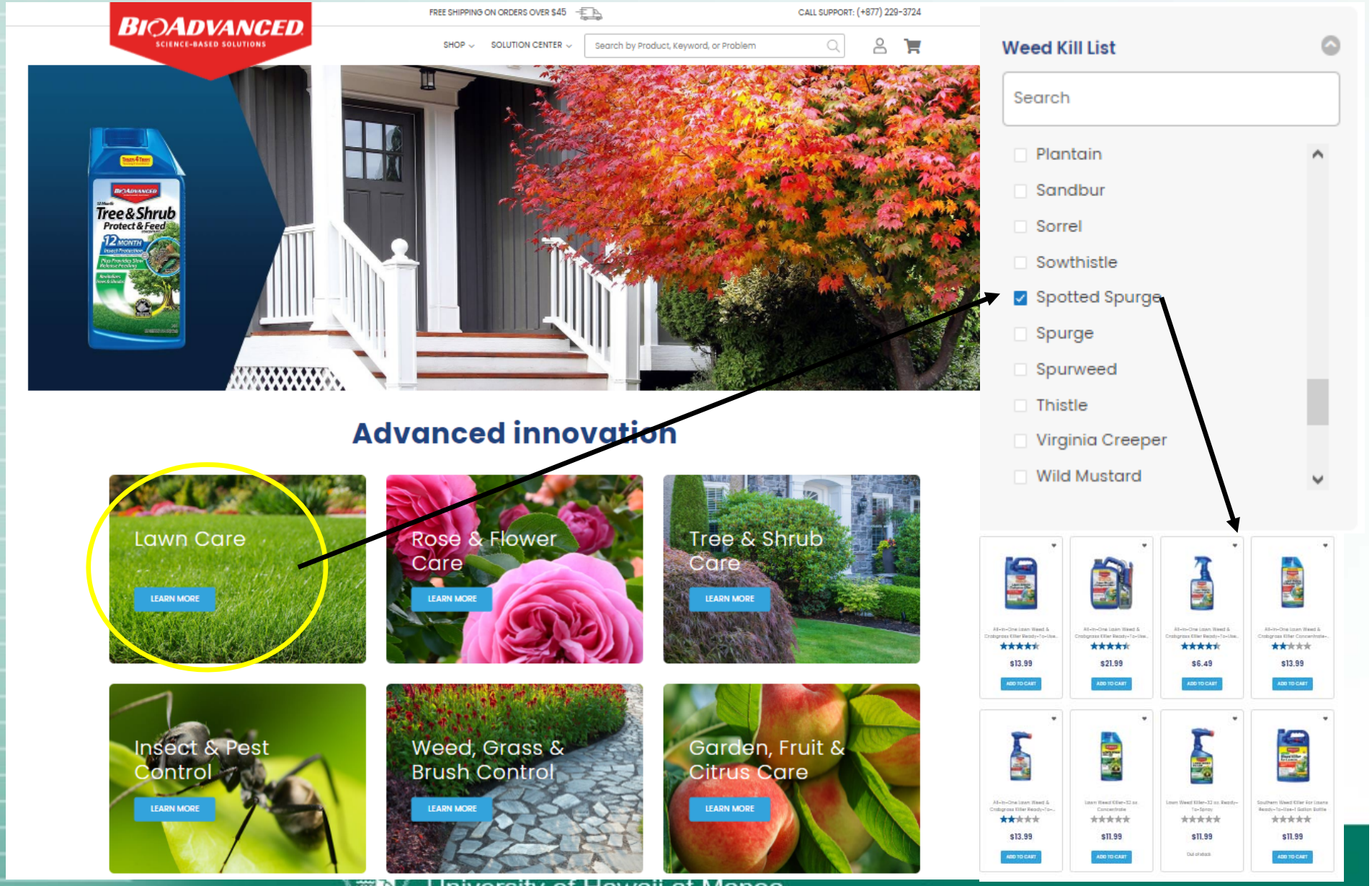
Search Parameters:
Product Type: Herbicide
Crop: Zoysia Grass
Pest1: nutsedge
State: Hawaii

| Product | EPA | Manufacturer | AI |
|---|---|---|---|
| Basagran® T&O herbicide | 7969-326 | BASF Professional and Specialty Solutions | Bentazon |
| Certainty® Turf Herbicide | 59639-226 | Valent U.S.A. LLC Professional Products | Sulfosulfuron |
| Katana® Turf Herbicide | 71512-12-2217 | PBI-Gordon Professional | Flazasulfuron |
| Monument® 75WG | 100-1134 | Syngenta Professional Products | Trifloxysulfuron-Sodium |
| Pennant MAGNUM® | 100-950 | Syngenta Professional Products | S-metolachlor |
| SedgeHammer® + | 81880-24-10163 | Gowan Company | Halosulfuron-methyl |
| SedgeHammer® Turf Herbicide | 81880-1-10163 | Gowan Company | Halosulfuron-methyl |
| Surepyc™ | 74530-63-5481 | Amvac Chemical Corporation | Sulfentrazone |
| Tower® Herbicide | 7969-239 | BASF Professional and Specialty Solutions | Dimethenamid-P |

** Data supplied pursuant to the 'Terms of Use' at www.cdms.net

# Web resources for landscape weed control.

Bioadvanced – products for homeowners https://www.bioadvanced.com/ )



# Factors for a healthy lawn

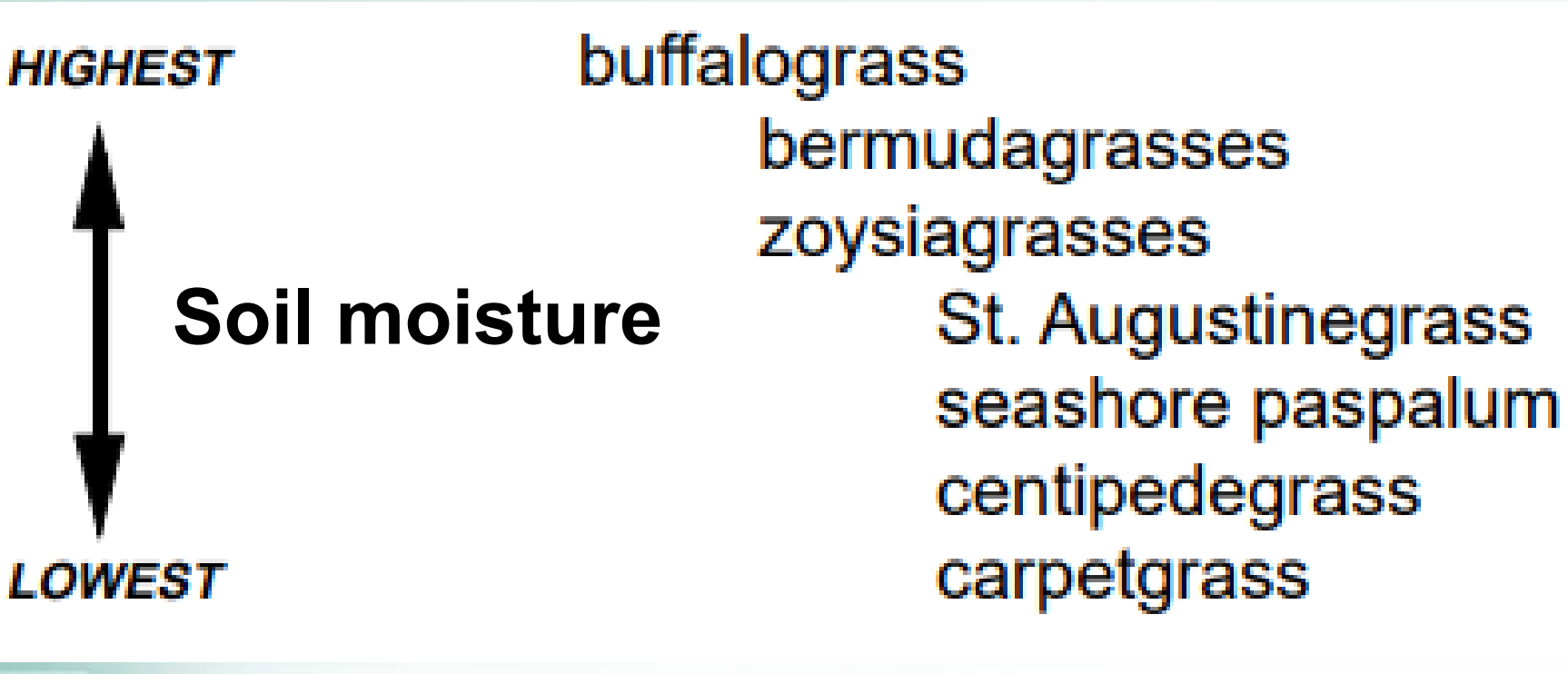
## A healthy lawn is the best form of weed control

**Automated irrigation essential to a healthy lawn**

# Factors for a healthy lawn

**Adaptions of Turfgrasses in Hawaii - 1998**
**https://www.ctahr.hawaii.edu/oc/freepubs/pdf/TM-4.pdf**

## Drought Tolerance – Seasonal Moisture stress



# Factors for a healthy lawn

## Proper growth:

- **Water - automated, amount, coverage**

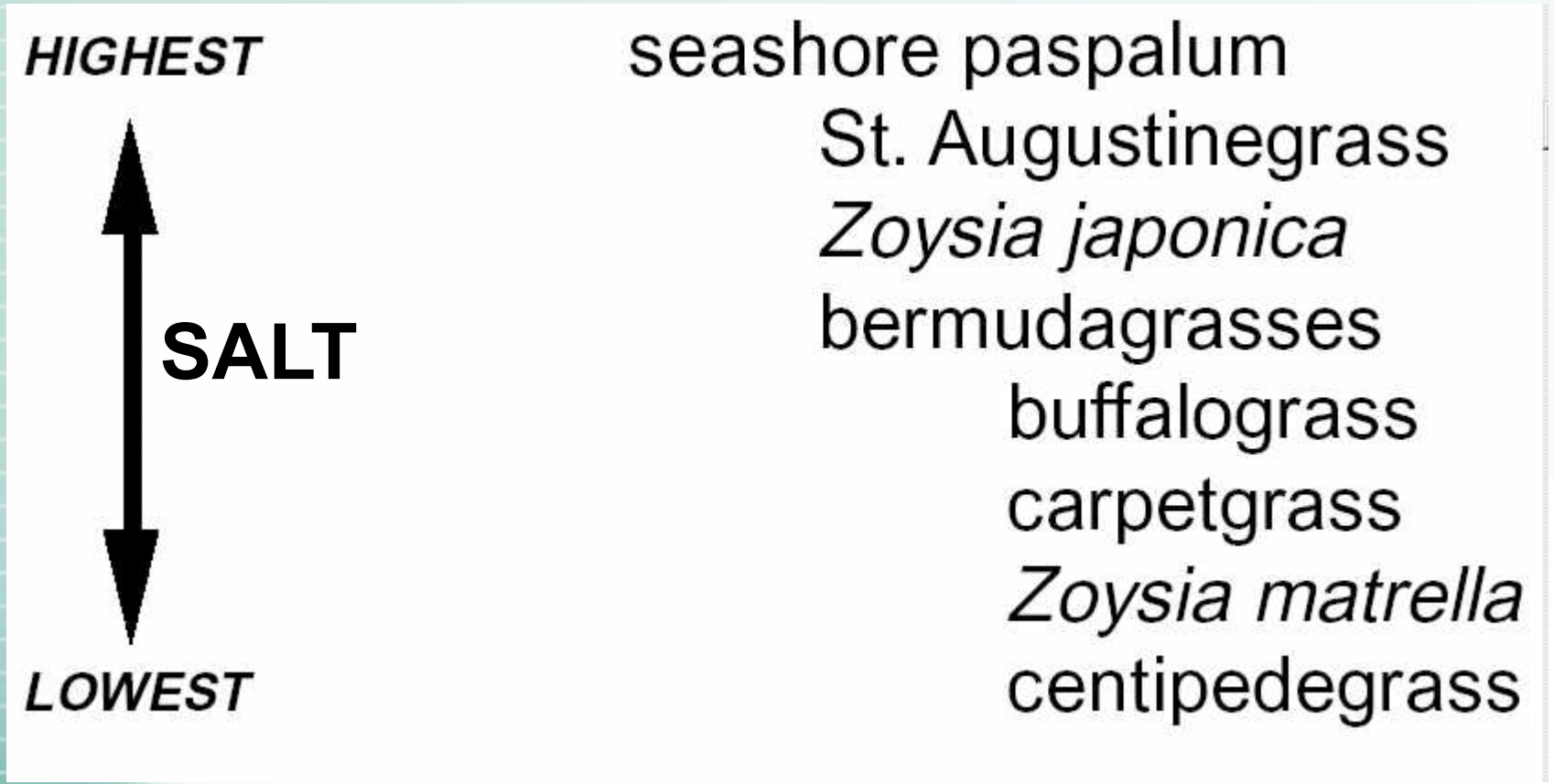
1. **Weeds that thrive in wet soil near irrigation heads and low spots**
2. **Drought tolerant weeds where irrigation misses-wind or blockages**
3. **Uniform turf = uniform water coverage**

- **Water quality – salty(recycled) or fresh**
- **Light - full sun vs shade**

# Factors for a healthy lawn

**Adaptions of Turfgrasses in Hawaii - 1998**
**https://www.ctahr.hawaii.edu/oc/freepubs/pdf/TM-4.pdf**

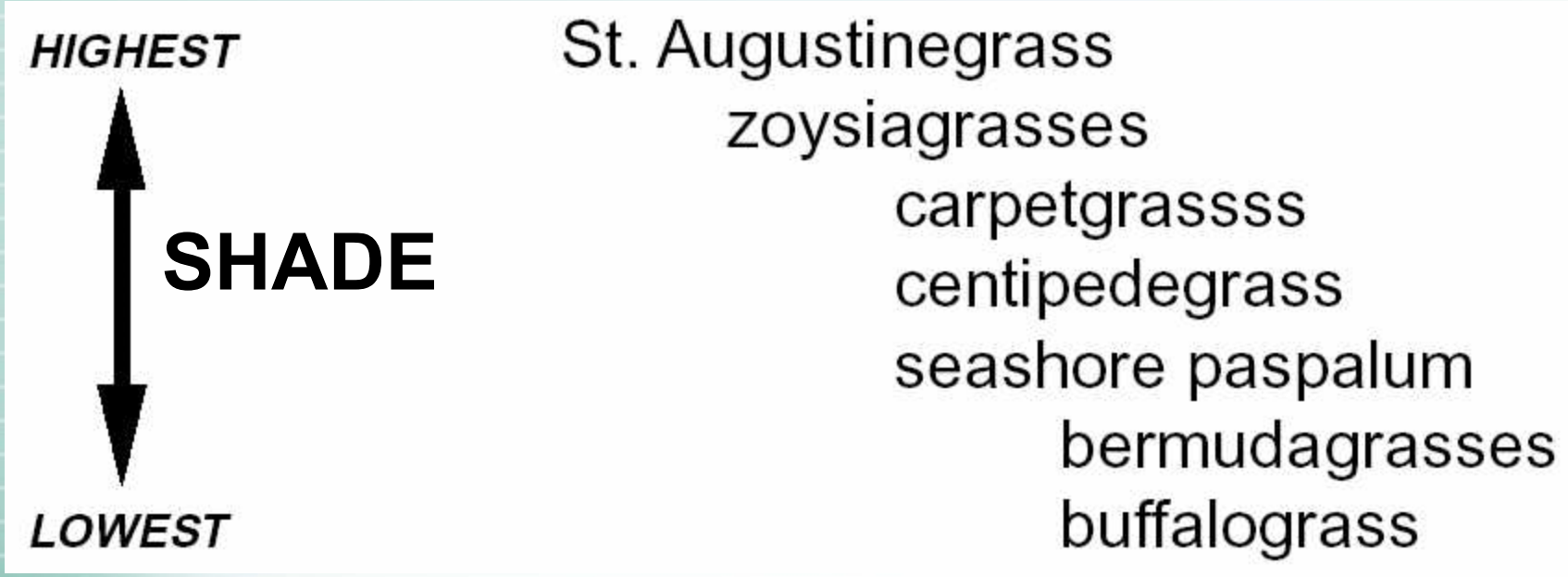
## WATER QUALITY – SALTY/Recycled OR FRESH



# Factors for a healthy lawn

**Adaptions of Turfgrasses in Hawaii - 1998**
**https://www.ctahr.hawaii.edu/oc/freepubs/pdf/TM-4.pdf**

## LIGHT - FULL SUN VS SHADE



# Factors for a healthy lawn

## Shade + Compaction + Water

# PROBLEM BROADLEAF WEEDS

Legumes :creeping indigo, desmodiums, clovers

Spurges: prostrate, garden and graceful

Misc brd lf.: Amaranths, ground ivy, oxalis


Creeping indigo
*Indigofera spicata*

# Alyce Clover - *Alysicarpus vaginalis*


Desmodium triflorum – beggar weed

# Yellow wood sorrel
## *Oxalis corniculata*


Khaki weed
*Alternanthera pungens*

Graceful spurge *Euphorbia hypericifolia*

Garden spurge
Euphorbia hirta

Prostrate spurge Euphorbia prostrata


**Ground ivy**
*Glechoma hederacea*

# 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

# 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 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

## MSM Turf Herbicide

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

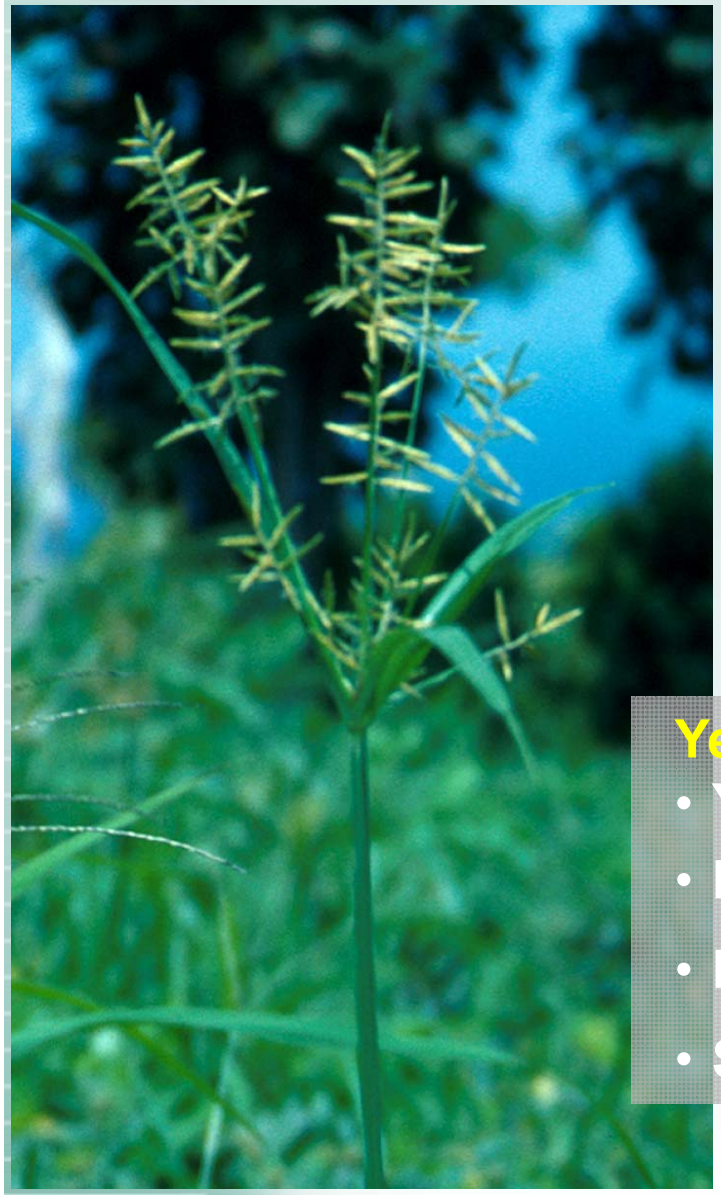
# Sedge Weeds in Hawaiian Landscapes

**Purple nutsedge**
**Yellow nutsedge**
**Green Kyllinga**
**White Kyllinga**

# Purple Nutsedge

## *Cyperus rotundus*

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



PURPLE NUTSEDGE

**Yellow Nutsedge - *Cyperus esculentus***

- 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

# Yellow Nutsedge - Cyperus esculentus

**A refreshing beverage is made by mixing the ground tubers with water, cinnamon, sugar, vanilla and ice. The ground up tuber can also be made into a plant milk with water, wheat and sugar. An edible oil is obtained from the tuber. It is considered to be a superior oil that compares favorably with olive oil. [Facciola. S.** Cornucopia - A Source Book of Edible Plants.]

# White Kyllinga

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


White kyllinga
*Kyllinga nemoralis*

# Green Kyllinga

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


Green kyllinga – *Kyllinga brevifolia*


INCHES
VAN WATERS & ROGERS
METRIC

# *Eleocharis* spp.

Forest and Kim Starr

# Commonly used herbicides for selective sedge control in turf

**Sandea/SedgePro/SedgeHammer**

**Certainty**

**Monument**

# Commonly used Postemergence Sedge herbicides

## Sandea/Sedge Pro

- 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 – OK for residential use.

# 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, Residential OK.

# Commonly used Postemergence Sedge herbicides

## Monument

- Single product
- Use on Bermuda, zoysia grass, St. Augustine-sod production only.
- Controls sedges and selected grass and broadleaf weeds
- Suppression of Crab, Dallis and Torpedograss
- Controlls Creeping Indigo, Khakiweed, Oxalis and Black medic
- OK for residential, sold in .5 gram pack (2gal/1000 $ft^2$)
- With caution near tree roots.

# Grassy Weeds in Hawaiian Turf

Australian Carpet Grass

Hilo Grass

Goose grass

Dallisgrass

Love grass

Henry's CG

Tropical Signal Grass

Star Grass

Smut grass

Pitted Beardgrass

Torpedo Grass

# Australian carpet grass

*Axonopus compressus*

Forest Starr & Kim Starr

Tropical Plant & Soil Sciences Department
University of Hawaii at Manoa

# Hilo grass

*Paspalum conjugatum*

Tropical Plant & Soil Sciences Department
University of Hawaii at Manoa

# Similar looking weedy grasses

# Goose grass

*Eleusine indica*

# Dallisgrass

*Paspalum dilatatum*



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University of Hawaii at Manoa

# Love grass

*Eragrostis amabilis*
*Eragrostis tenella*

# Carolina Love grass

***Eragrostis pectinacea***

Forest & Kim Starr

**Tropical Plant & Soil Sciences Department**
University of Hawaii at Manoa

# Henry's Crabgrass

*Digitaria ciliaris*

Forest & Kim Starr

**Tropical Plant & Soil Sciences Department**
University of Hawaii at Manoa

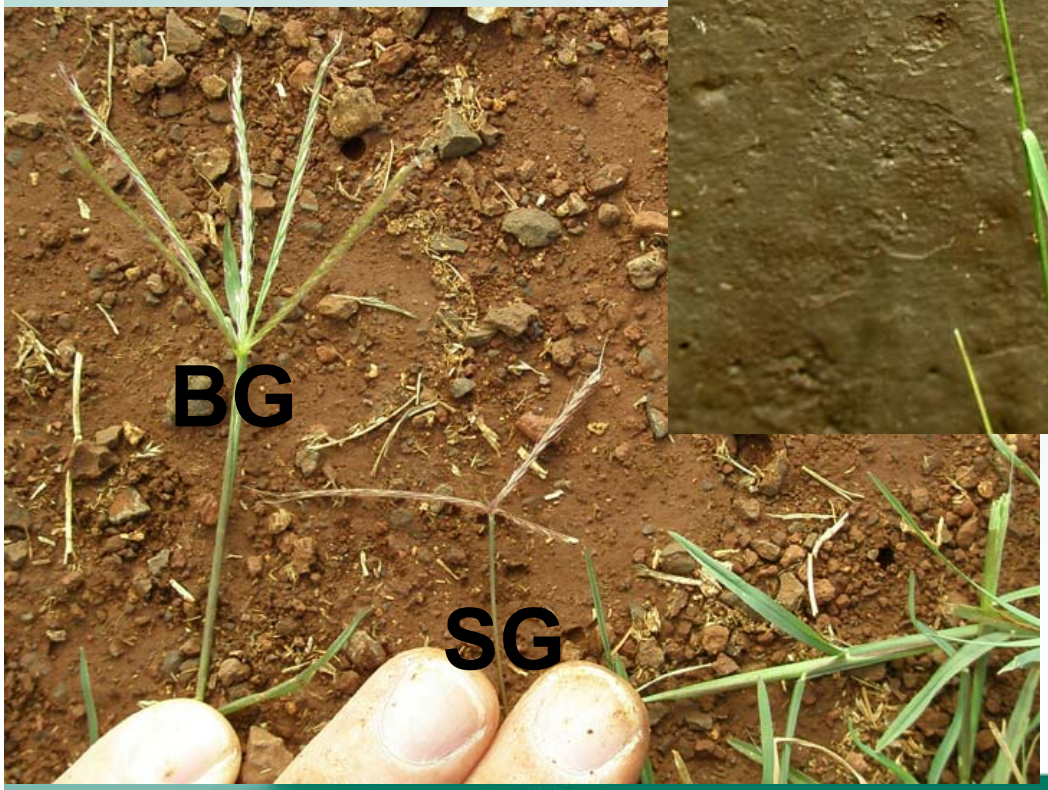
# Tropical signal grass

***Urochloa subquadripara***

**Tropical Plant & Soil Sciences Department**
University of Hawaii at Manoa

# Star Grass

*Chloris divaricata*




**Tropical Plant & Soil Sciences Department**
University of Hawaii at Manoa

# Star Grass

Tropical Plant & Soil Sciences Department
University of Hawaii at Manoa

# Smutgrass

*Sporobolus indicus*

# Pitted beardgrass

***Bothriochloa pertusa***

Forest Starr & Kim Starr

# Torpedo Grass

*Panicum repens*

# Commonly used herbicides for Post-emergence Grassy Weed in Bermuda (BG), Zoysia (Z) & Seashore Paspalum (SP)

- MSMA – (MSMA 6.6, MSMA 6 PLUS & other names) BG, Z
- Metribuzine (Sencor, Tricor) – BG, Z
- Mesotrione (Tenacity) – BG, Z, SP
- Topramezon (Pylex) – BG, Z, SP
- Thiencarbazone, iodosulfuron, dicamba (Celsius WG) – BG, Z
- Thiencarbazone + foramsulfuron + halosulfuron) (Tribute Total) BG, Z
- Foramsulfuron (Revolver) BG, Z
- Trifloxysulfuron (Monument) – BG, Z
- Sulfentrazone (Dismiss) BG, Z, SP.
- Pinoxaden (Manuscript) – BG, Z

**Comprehensive list of herbicides for weeds in turf, pastures, forest, most crops**

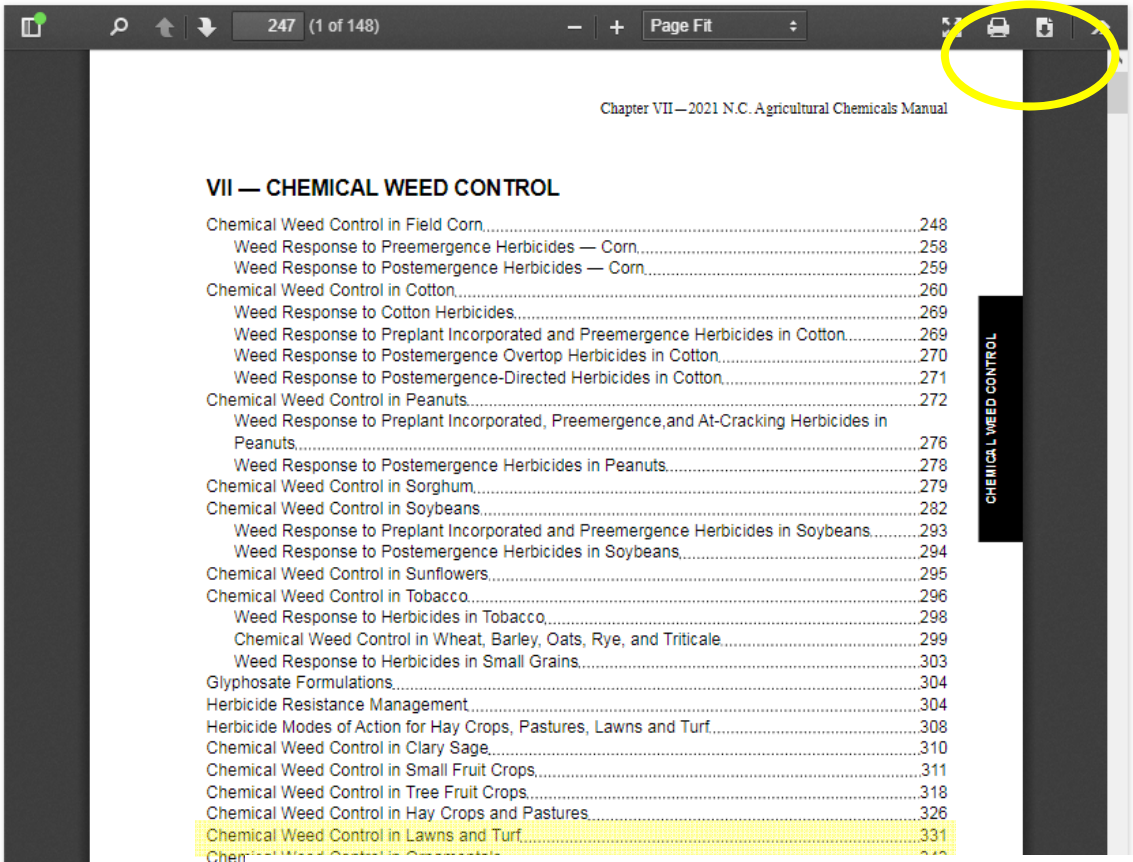
2021 North Carolina Agricultural Chemicals Manual
**https://content.ces.ncsu.edu/north-carolina-agricultural-chemicals-manual**

# Comprehensive list of herbicides for weeds in turf, pastures, forest, most crops

2021 North Carolina Agricultural Chemicals Manual

**https://content.ces.ncsu.edu/north-carolina-agricultural-chemicals-manual**

## Chemical Weed Control



247 (1 of 148) — Page Fit

Chapter VII—2021 N.C. Agricultural Chemicals Manual

CHEMICAL WEED CONTROL

### VII — CHEMICAL WEED CONTROL



### Table 7-14. Chemical Weed Control in Lawns and Turf

| Herbicide and Formulation | Amount of Formulation Per 1,000 sq ft | Amount of Formulation pe Acre | Pounds Active Ingredient per Acre | Precautions and Remarks |
|---|---|---|---|---|
| **Postemergence Control, Purple and Yellow Nutsedge, Kyllinga Species (continued)** | | | | |
| MSMA, MOA 17 (6 SL, 6.6 SL) | | several concentrations | 2 to 3 | See remarks for MSMA above. Will require at least 2 applications 7 to 10 days apart. |
| sulfosulfuron, MOA 2 (75 DG) | 0.017 to 0.029 oz | 0.75 to 1.25 oz | 0.035 to 0.059 | May be applied to certain ornamental native grasses and also bermudagrass species, zoysiagrass, centipedegrass, St. Augustinegrass, and kikuyugrass grown on sod farms, golf courses (excluding greens), commercial and residential turf that is highly managed, and other noncrop areas. Use 0.75 to 1.25 ounces per acre, and repeat in 4 to 10 weeks if needed. Use a nonionic surfactant at |

# Perennial Grassy Weeds in Bermuda grass

- Australian carpet grass (*Axonopus compressus*)
- Torpedo Grass (*Panicum repens*)
- Tropical Signal Grass (*Urochloa distachya/ Brachiaria subquadripara*)

**ENABELING SOIL CONDITION = HIGH TO EXCESSIVE SOIL MOISTURE**

**MUST BE ADDRESSED FOR LONG TERM CONTROL IN ALL TURF GRASS SETTINGS**

# Search: “Hawaii Weed Control”

**https://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 2015

TPSS 491/711 Digital Tools for Scientific Content Fall 2012

Establishing Native Plants on Hawaii's Roadways

**Update on Perennial Grass Weed Control in Hawaii's Sport Turf – 03/03/2020**
**Simplot Turf & Pest Management Workshop**

**https://www.ctahr.hawaii.edu/deFrankJ/NON_HOMEPAGE_PAGES/Simplot_03032020.htm#Simplot_2020**

Topics Covered included:

- Review of Goose and Bermuda Grass management in seashore paspalum turf.
- Herbicides for perennial grassy weed control
- Research update: Focus on Torpedo grass (Panicum repens).
- Participant Q&A: What's your weed control problems in turf


**Written description of protocol in Hawaii Landscape March|April 2020**

# Improved weed wick for fast growing weeds in new turf plantings

Tropical Plant & Soil Sciences Department
University of Hawaii at Manoa

# Factors for wiper applications

1. Pre application growth activation of weeds and turf.
2. Sufficient height difference between weeds & turf.
3. Glyphosate at 15-20% (20-25 oz/gal) for wiping weeds.
4. 2-3 day delay mowing and irrigation after wiper-app.



# Wiper use at West Loch Golf Course - 2022

Tropical Plant & Soil Sciences Department
University of Hawaii at Manoa

# Wiper results 13-days after treatment

# Wiper results 13-days after treatment

# Wiper results 13-days after treatment

## Wiper results 13-days after treatment

# For more information

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