

# 3. E6 Weeds

**leafy spurge**



# Weeds

## Introduction

### When is a plant a weed?

- **The simple definition of a weed is any unwanted plant.**
- **Any plant can be considered a weed if it interferes with the growth or aesthetic appearance of a turf and ornamental plant or if it spreads into areas it is not wanted.**

# Weeds

## Introduction Characteristics of weeds

- **Adapt well to local climates, soils, and other environmental conditions.**
- **Can compete with cultivated plants.**
- **Produce large quantities of seed.**
- **Can be spread from cultivation practices such as hoeing , mowing, or root division (e.g. quack grass).**

# Weeds

## Weed reproduction

Weeds Reproduce from seed sexually or vegetatively

**Seed dispersal** movement of the reproductive units seeds of a flowering plant away from the parent plant.

**Vegetative propagation** a type of asexual reproduction where new plants grow from

- Underground structures ,rhizomes, tubers, bulbs
- Cuttings
- Grafts

# Weeds

## Aesthetics

- Each property owner may have a different tolerance for weeds
- Keeping plant beds free of weeds improves the aesthetic value of the property



Creeping Charlie

# Weeds

## Steps for weed identification

- Identify the weed.
- Learn characteristics of weed groups.
- Use plant identification keys, descriptive couplets refine identification

### Dichotomous Key – Family: Candius

- 1a. Candy is chewy.....2
- 1b. Candy is hard.....7
- 2a. Candy is wrapped.....3
- 2b. Candy is not wrapped.....Ursa gummius
- 3a. Candy is rounded.....4
- 3b. Candy is not rounded.....5
- 4a. Wrapper is all white.....Saltus taffinia
- 4b. Wrapper is not all white.....5
- 5a. Wrapper is brown and white.....Tutus rollus
- 5b. Wrapper is not brown and white....6
- 6a. Wrapper is silver.....Chocolatus cyssan
- 6b. Wrapper varies in color.....Stellaria explodus
- 7a. Candy is spherical (ball-shaped)...8
- 7b. Candy is not spherical.....9
- 8a. Candy is wrapped.....11
- 8b. Candy is unwrapped.....Mandibulus crackus
- 9a. Wrapper is transparent.....10
- 9b. Wrapper tells the flavor.....Joyous rancheria
- 10a. Wrapper is clear.....Mintus stripus
- 10b. Wrapper is yellow.....Ranunculus scotchus
- 11a. Candy is on a stick.....Moronus moronus
- 11b. Candy is not on a stick.....Spherus combustus

# Weeds

## Life cycle

- Weeds can be classified as annual, biennial, or perennial life cycles.
- Chemical and cultural control should consider weed life cycle of the targeted weed.

# Weeds

## Life cycle Annual weeds

- Complete their life cycle from seed in one year.
- Can be classified as summer , germinate in spring, die in fall
- Or winter germinate in fall die in spring .



# Weeds

## Life cycle. Biennial weeds

- Biennial weeds often have a rosette stage in the fall. Best control is in rosette stage.
- All biennial weeds are broadleaf weeds.

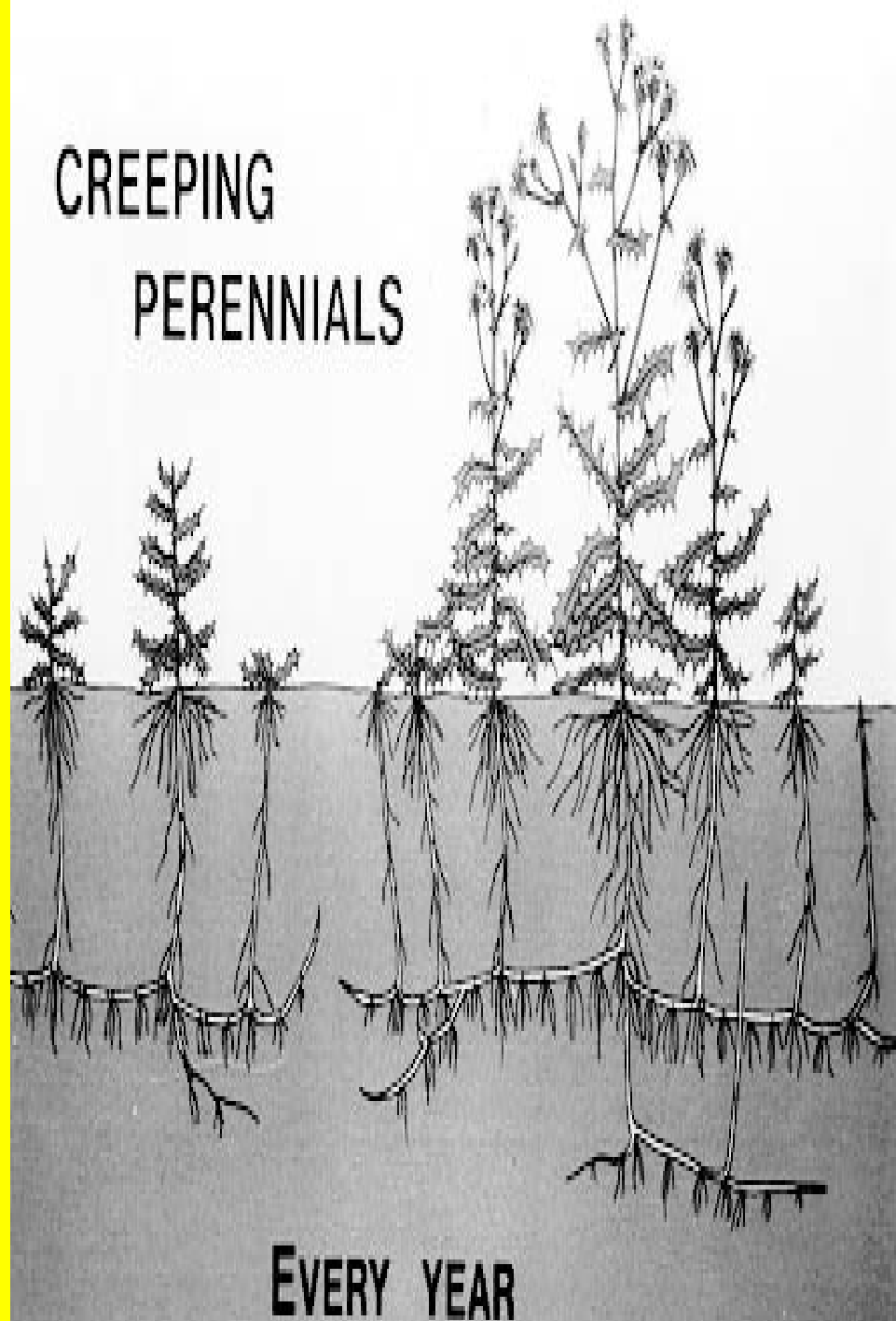


Musk thistle

# Weeds

## Life cycle Perennial weeds

- Creeping perennial weeds are the most difficult to control, spread by **stolons**, above ground or **rhizomes**, below ground.
- Control stop seed production and destroy above and below ground plant parts.



# Weeds

## Life cycle. Perennial weeds

- Live more than 2 years.
- Produce a deep root structure , taproot, tuber, bulb or corm, that allows them to survive from year to year.
- Reproduce from seed or vegetatively asexual reproduction.

# Weeds

## Indicator Weeds

- The presence and types of weeds, called **indicator weeds**, help identify weeds on the site. Weeds are indicative of cultural problems which must be resolved or weeds will return.
- The best defense against weeds is healthy turfgrass.
- Exposed soil provides an opportunity for weed infestation.

# Weeds

## Weed control

- Annual weeds keep plantings tight and mulch to shade out dormant weed seeds and prevent germination.
- Biennials control in the rosette stage at the end of the 1<sup>st</sup> growing season.
- Perennials creeping perennials are the most difficult to control stop seed production and destroy the above and below-ground plant parts.

# Weeds

## Good cultural practices

Mulch around  
ornamentals.

- Mulch around  
perennials, a 2-3 inch  
layer helps prevent  
weed problems.
- Mulching around  
perennials will also  
reduce damage from  
lawn equipment.



Mini fir chips used as a mulch

# Weeds

## Good cultural practices

- **Mulch around ornamentals.**
- **Replenish mulch as it biodegrades.**
- **Rock used as a mulch does not benefit plants.**
- **Use landscape fabric and not sheet plastic under mulch to provide water infiltration.**

# Weeds

## Good cultural practices

Prevent weed seed dispersal and vegetative propagation.

Remove weeds before they disperse their seeds.

## Seed dispersal facilitators

- Wind
- Water
- Animals
- Humans





# Weeds

## Good cultural practices

- Prevent weed seed dispersal and vegetative propagation.
- **Vegetative propagation** a type of asexual reproduction where new plants grow from underground structures, rhizomes, bulbs, tubers or from cuttings or grafts

# Weeds

## Good cultural practices

Prevent weed seed dispersal and vegetative propagation.

- Tilling can result in vegetative propagation of weeds e.g., field bindweed.
- If herbicides are needed systemics are more effective than contact sprays—systemic herbicides are absorbed by the roots and translocated to other plant parts.
- **Systemics** will work on annual and perennial weeds but most often are used to control perennial weeds.

# Weeds

## Good cultural practices

Good cultural practices will reduce weed populations and the need for weed control measures.

- Mowing at proper heights
- Fertilize according to plant needs
- Treat weeds when they are most susceptible, immature, or at the best time in their life cycle

# Weeds

## Good cultural practices for minimizing weed growth

- Fertilize according to plant needs. Minimize area for weed infestation.
- Mow turfgrass higher.
- Aerate
- Mulch
- Remove weed seeds.
- Prevent vegetative propagation of weeds.

# Weeds

## General Guidelines for control broadleaf weeds.

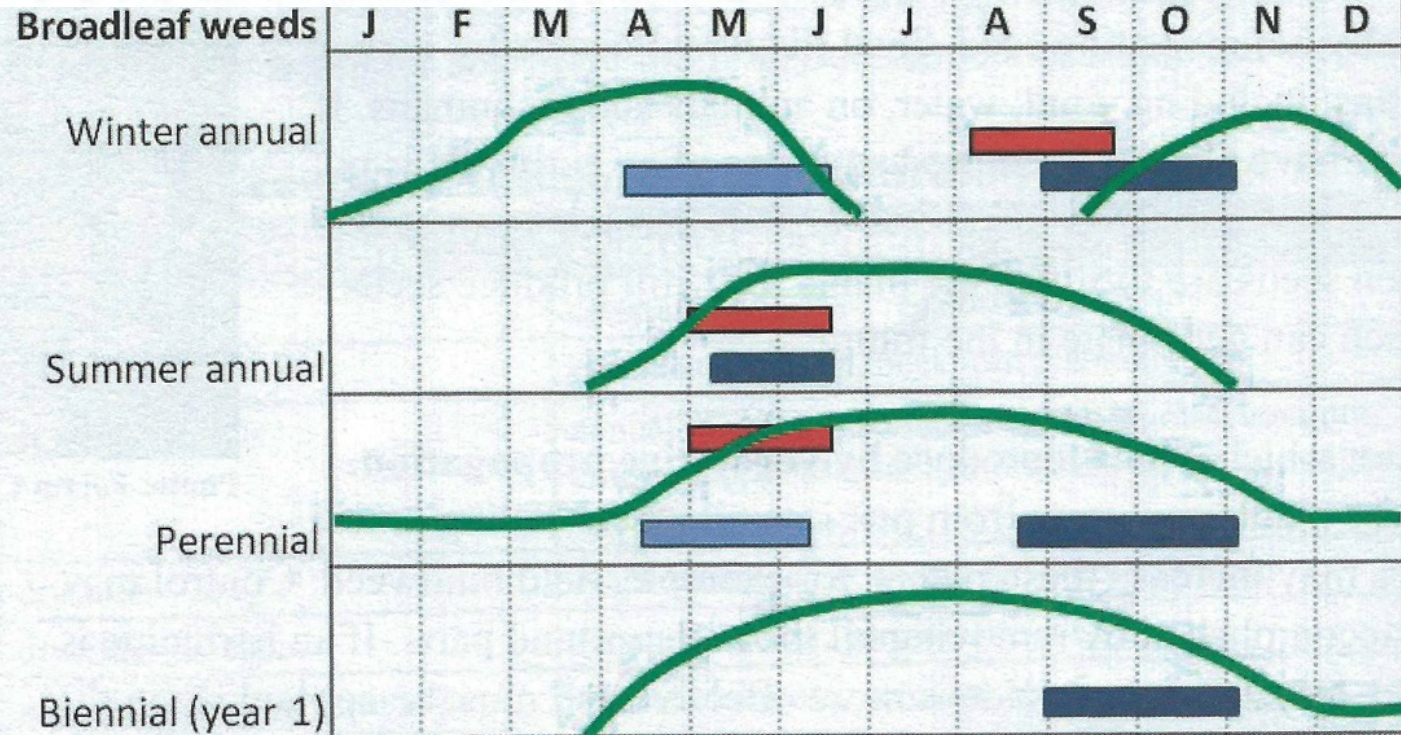
Optimal time  
postemergence



Optimal time  
preemergence



Alternate time



# Weeds

## General Guidelines for control of grassy weeds

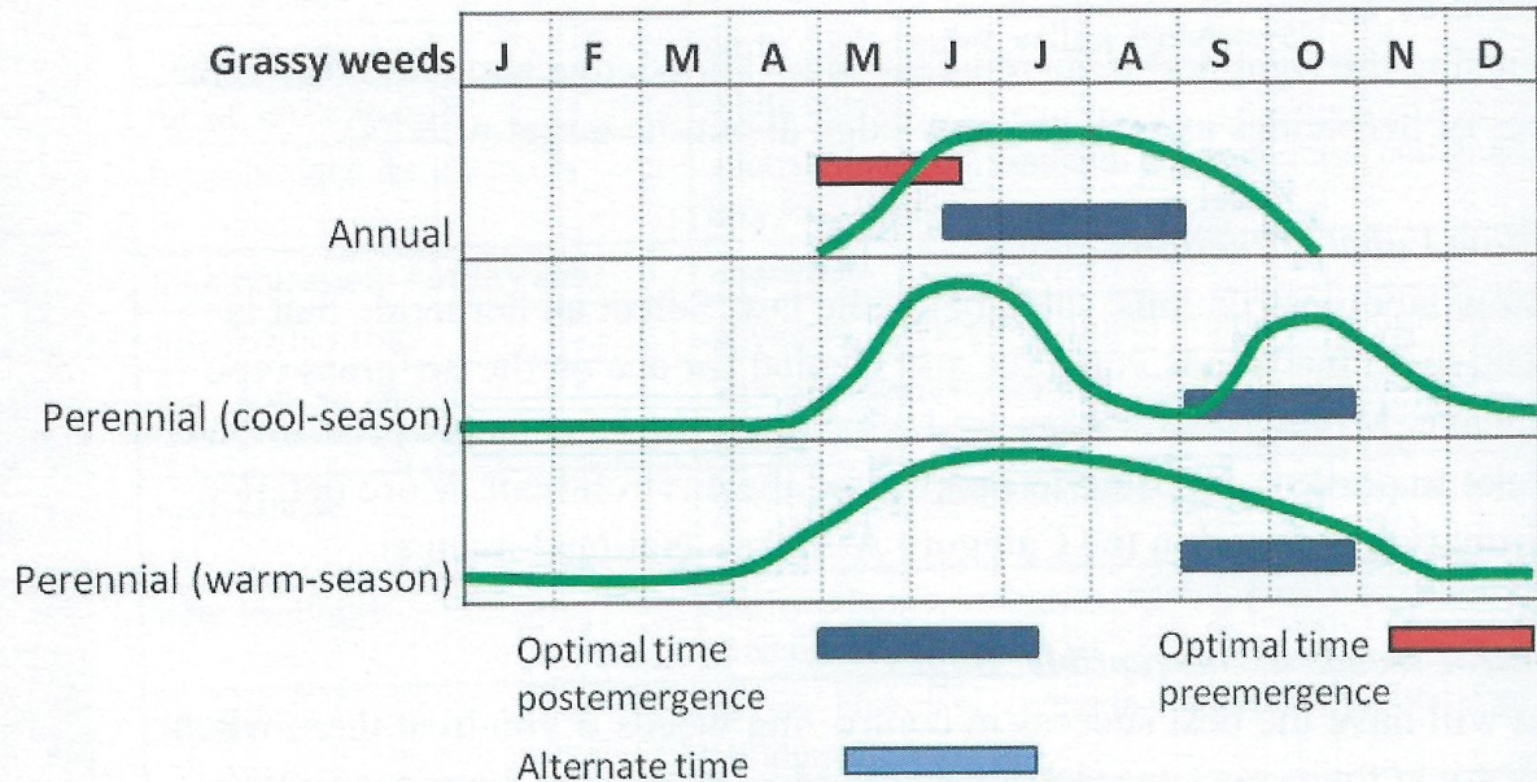
Optimal time  
postemergence



Optimal time  
preemergence



Alternate time



# Weeds

## Characteristics to consider in selecting herbicides

- Preemergent or Postemergent
- Selective or non-selective
- Contact or systemic
- Herbicide mode of action, MOA
- Amine or ester formulation
- Single herbicide or mixture
- With or without adjuvant

# Weeds

## Preemergent/Postemergent

- **Preemergence herbicide** a chemical applied to the soil and used to control weeds prior to their germination.
- Crabgrass emerges at about 60 degrees F soil temperature measured a 1 inch depth with a soil thermometer.



Crab grass



# Weeds

## Establish and maintain good cultural practices

- **Aerate to reduce compaction and associated weed problems.**
- **Overseed**
- **Use mechanical controls to control weeds before they become too large or numerous.**
- **Hand weed in smaller, manageable areas it's better for the environment.**
- **Chose the right plant for site conditions.**

# Weeds

**Core aeration**  
reduces soil  
compaction and  
improves uptake of  
water and fertilizer for  
a healthy lawn.



**Turf Aerator**  
**RyanTurfRenovation**

# Weeds

## Types of weeds

- **Grasses**
- **Sedges**
- **Mosses and algae**
- **Woody broadleaf weeds**
- **Herbaceous broadleaf weeds**

# Weeds

## Weed Control

**Sedges** grass-like plants that may be considered weeds in turf. e.g., yellow nutsedge sedges are mostly found in wetlands or moist soils



Yellow nutsedge

# Weeds

## Weed Control

### Mosses and algae

- **Mosses** generally short, small, soft, flowerless, seedless, and mat forming.
- Tend to grow in moist areas but can grow in drier, less-fertile conditions.
- Also favor compacted acidic soils.
- Considered unacceptable in turf.



# Weeds

## Weed Control

### Mosses and algae

- **Algae** filamentous tiny plants containing chlorophyll
- Grow on wet or compacted soils in full sun
- Form mats of green scum that dry black



Algal bloom on moist soil

# Weeds

## Weed Control

- **Woody broadleaf weeds** have woody stems e.g., buckthorn, honey suckle, and Virginia creeper.
- **Include trees, shrubs, and some vines.**



**glossy buckthorn removal**

# Weeds

## Weed Control

- **Herbaceous broadleaf weeds** a large group of plants with broad leaves, branching veins and non-woody stems e.g., knotweed, plantain, and dandelion.
- For help with identification refer to photograph or drawings or use an identification key or consult a plant specialist at an extension office



# Weeds

## Steps for effective weed control

- Identify the weed.
- Determine when and why the weed problem occurred.
- If necessary, determine an appropriate herbicide.



# Short Summary

Weeds can be classified as having annual, biennial, or perennial life cycles.

Herbaceous broadleaf weeds, is a large group of plants with broad leaves, branching veins and non-woody stems e.g., knotweed, plantain, and dandelion.

Algae grow on wet or compacted soils in full sun

# Quick Questions

What two groups can weeds be classified into?

*Grassy monocots and broadleaf dicots*

What are sedges?

*Sedges are grass-like plants that may be considered weeds in turf.*

What are algae?

*Algae filamentous tiny plants containing chlorophyll.*

# Short Summary

**Perennial weeds reproduce from seed or vegetatively through asexual reproduction.**

**Aerate to reduce compaction and associated weed problems.**

**Core aeration reduces soil compaction and improves uptake of water and fertilizer.**

# Quick Questions

How long do perennial weeds live?

*More than two years*

What is the purpose of a core aerator?

*Reduce soil compaction*

What is a good cultural practice for mowing?

*Mow at proper heights 2 ½ to 3 inches*

# Weeds

| Cultural Problem       | Indicator Weeds   |
|------------------------|---|
| Alkaline soils         | Broadleaf plantain, buckthorn plantain  |
| Compacted soils        | Annual bluegrass, common chickweed, common Bermudagrass, goosegrass, knotweed, prostrate spurge |
| Moist, infertile soils | White clover  |
| High nitrogen soils    | Annual bluegrass, common Bermudagrass, crabgrass, bentgrass, mallow, purslane                   |
| Shade                  | Annual bluegrass, ground ivy, violets   |

# Short Summary

**Preemergence herbicide a chemical applied to the soil and used to control weeds prior to their germination.**

**Remove weeds before they disperse their seeds.**

**Systemic herbicides are more effective than contact sprays systemic herbicides are absorbed by the roots and translocated.**

# Quick Questions

When is a Preemergence herbicide applied?

*Prior to weed germination.*

How much mulch should you apply?

*2 to 3 inches*

Are systemic herbicides used more often with annual or perennial weeds.

*Perennial weeds*



# Weeds

## Preemergent/Postemergent

- **Postemergence herbicide** a chemical applied to plants and used to control weeds after they have germinated.
- **Spot spray treatment** of weeds will minimize herbicide use.



Spot spraying weeds in a lawn

# Weeds

## Select Appropriate Chemical Herbicide Types.

### Selective/Non-selective

- **Selective herbicides** control certain types of plants especially within other plants e.g., spraying 2,4-D on broadleaf weeds within turf.
- **Non-selective herbicides** kill or damage all plants when applied at label rates. Glyphosate, Roundup, is a example of a non-selective herbicide.
- **Selective herbicides** at improper mix rates or applied at high ambient temperatures can harm non-target plants.

# Weeds

## Select Appropriate Chemical Herbicide Types Contact/Systemic.

- **Contact herbicides** kill or stunt only the plant parts that are treated with the chemical.
- **Systemic herbicides** are effective on annual and perennial weeds, but are often used to control perennial weeds.

# Weeds

## Select Appropriate Chemical Herbicide Types.

### Modes of Action

**Mode of Action, MOA** the way in which a pesticide exerts a toxic effect on the target plant, animal, or microorganism.

- The Weed Science Society of America groups herbicides into 27 different modes of action e.g., growth inhibitors, photosynthesis inhibitors.
- Avoid developing herbicide resistance. When multiple applications are required select a herbicide with a different mode of action.

# Weeds

Select Appropriate Chemical , Herbicide Types.

Amines vs. Esters.

- **Amine** formulations are less volatile than ester formulations for use in ornamentals.
- **Ester** formulations have a higher potential to volatilize in hot, dry temperatures.
- **Esters** are more effective for broadleaf weed control in cool spring months, better leaf penetration of the leaf cuticle. Amine formulations are safer in warmer temps May thru summer.

# Weeds

## Select Appropriate Chemical Herbicide Types.

### Combination Products.

- **Combination products** are a mixture of two or more herbicide AI's.
- Fertilizer/herbicide combinations are also available. But overuse can result in unnecessary application of herbicide.
- When possible apply spot sprays

# Weeds

## Select Appropriate Chemical Herbicide Types.

### Adjuvants.

- **Adjuvant**, a spray solution additive to make a pesticide/herbicide more effective or help the spray mix process.
- **Surfactant**, surface active ingredient. An inert ingredient that improves the spreading, dispersing, or wetting properties of a pesticide mixture

# Weeds

Select Appropriate Chemical Herbicide Types.

Adjuvants.

- **Surfactants** include wetting agents, crop oils, anti-foaming agents, buffering agents, and compatibility agents. Drift retardants increase droplet size to reduce pesticide drift.
- Check the label. Some products already contain adjuvants.



# Weeds

Select Appropriate  
Chemical Herbicide  
Types. Surfactant use of  
a sticker/spreader.

Without spreader sticker surfactant



# Weeds

Select Appropriate  
Chemical Herbicide  
Types.

Surfactant use of a  
sticker/spreader.

With spreader sticker surfactant



# Short Summary

**Selective herbicides control certain types of plants especially within other plants e.g., spraying 2,4-D on broadleaf weeds within turf.**

**Adjuvant, a spray solution additive to make a pesticide/herbicide more effective or help the spray mix process.**

**Fertilizer/herbicide combinations are available. overuse can result in unnecessary herbicide application of herbicide.**

# Quick Questions

**What is a surfactant?**

*A 'surface active ingredient' that improves the effectiveness of a herbicide application.*

**What is a contact herbicide?**

*A contact herbicide only kills or stunts the plant parts that are treated with the chemical.*

**What is a good cultural practice for herbicide applications?**

*Use spot sprays when possible.*

# Weeds

## Noxious weeds **Minnesota Statutes Chapter 18** **Section 18.75 to 18.91.**

1. Eradicate list, 12 species, Oriental bittersweet and Grecian foxglove
2. Control list, 8 species, Canada thistle, leafy spurge, wild parsnip, spotted knapweed, purple loosetrife
3. Restricted noxious weeds, 5 species, common and glossy buckthorn, common reed, garlic mustard, multiflora rose
4. Specially regulated plants, 4 species, poison ivy, Japanese barberry, giant knotweed

# Weeds

## Minnesota Prohibited Noxious Weeds

**Eradicate list** measures must be taken to prevent these weeds from being introduced in MN. Above and below ground portions must be eradicated.

Transportation, propagation, and sale prohibited.



**Oriental bittersweet**

# Weeds

## Minnesota Prohibited Noxious Weeds

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Transportation, propagation, and sale prohibited.



Grecian foxglove

# Weeds

## Minnesota Prohibited Noxious Weeds Control list

Measures must be taken to prevent the spread or dispersal of propagating plant parts of listed species.

Transportation and sale are also prohibited.



5473513

Leafy spurge



UGA1400156

Wild parsnip



# Weeds

**Minnesota  
Prohibited Noxious  
Weeds**

**Restricted Noxious  
Weeds are plants  
that are widely found  
in MN and are  
detrimental to  
human or animal  
health, the  
environment,  
livestock, public  
roads, or other  
property.**

**Glossy buckthorn**

# Weeds

## Minnesota Prohibited Noxious Weeds

Specifically regulated  
plants may be native or  
have economic value  
but also have the  
potential to cause harm  
in a non-controlled  
environment.



Eastern poison ivy

# Weeds

## Invasive or Aggressive Plants

- Plants can be invasive but not be listed by the MDA.
- Control may be appropriate to confine them to specific areas.



Amur maple

# **Short Summary**

**Plants defined in Minnesota Statutes Chapter 18 Section 18.75 to 18.91 as noxious weeds must be controlled or cut so that seed production does not occur.**

**Weeds compete with cultivated plants for light, nutrients, water, and space.**

**The Minnesota Department of Agriculture MDA publishes the list of Minnesota noxious weeds.**

# Quick Questions

**What is MN law on noxious weeds?**

*Noxious weeds must not be sold, transported, or planted in Minnesota*

**What is the simple definition of a weed?**

*A weed is an unwanted plant*

**What is an example of an MDA specifically listed plant?**

*Poison ivy*

# Weeds

Compete with cultivated plant for light, nutrients, water, and space.

- Interfere with cultural management processes.
- May produce substances containing growth inhibitors that can retard desirable plants **alleopathy**.
- May be invasive and outcompete native habitat. **Invasive plants** are not native to MN and can cause economic or environmental harm or harm to human health.

# Weeds

**Damage caused by weeds. Why manage weeds?**

- **State law requirements**
- **Removal of invasive or aggressive weeds**
- **Improve aesthetic characteristics of the landscape.**

# **Short Summary**

**Counties can also designate specific plants as noxious with the permission of the MDA Commissioner.**

**Plant identification keys are useful tools in identifying weeds.**

**Learn the characteristics of weed groups.**



# Quick Questions

**What is the first step in dealing with a weed?**

*Identify the weed.*

**Keeping plant beds free of weeds offers what benefit?**

*It improves the aesthetic value of the property*

**Are all invasive plants MN noxious weeds?**

*Plants can be invasive but not be listed by the MDA.*