

# Basics of Successful Bare Ground Treatments

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October 9, 2015

# Bare Ground Challenges

- Basics
  - Purpose
  - Sites
- Application
  - Liquid sprays
  - Granules
- Herbicide
  - Properties
  - Persistence
- Environmental
  - What is nearby
  - Herbicide properties

# Bare Ground Challenges

- Basics
  - Purpose
    - Remove all plant material
    - Prefer long duration of control
      - Months
      - Years
  - Sites
    - Various

# Sites



# Terminology

- Good
  - Bare ground
  - Long term
- Bad
  - Soil sterilant
    - Poor term with regard to general public

# Bare Ground Challenges

- Application Methods
  - Liquid sprays
  - Granules



# Herbicides

## Choosing the product

- Site
- Weeds to be controlled
- Duration of control desired
- Cost
- Limitations on bidding

# Herbicides

## Choosing the product

- Site
  - Guard rails
  - Cable barriers
  - Tank farm
  - Electrical substation
- Weeds to be controlled
  - Annual, biennial, perennial
  - Invasive
  - State law requires

# Herbicides

## Choosing the product

- Duration of control
  - Months or years
- Cost of the product
  - Not the best way to choose product
- Limitations on bidding
  - State, county, city issues

# Environmental Concerns of Long term control

- What is nearby
  - Private property
  - Rivers, creeks
  - Crop fields
  - Highways or other roads
- Herbicide properties
  - Persistence



What is nearby is of critical importance for bare ground treatments

# Herbicide Persistence

- Desirable

- Weed control

- Undesirable

- Environmental  
contamination

# Persistence is a function of herbicide dissipation rate

- Herbicide rate
- Soil type
  - organic matter content
  - clay content
- Adsorption
- pH
- Plant material on soil surface
- Temperature
- Distribution in soil
- Repeat treatments
- Herbicide Formulation

# A type of bare ground?



How to handle paved parking areas?

Challenges

Approaches for control



Non treated 50 DAT

Treated 50 DAT

# Comparison of Herbicide Treatments for Sidewalk Crack Vegetation Control

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University of Kentucky

# Table 1. Information on Commercial Products for Vegetation Control

Roundup Extended Control plus Weed Preventer		Application equivalent to 145 gallons/acre	
Active Ingredient	Rate per acre	Notes	
glyphosate	9 lb ae		
diquat dibromide	7.1 oz	15 oz/ac max.	
imazapic	3 oz ae	equivalent to max. annual application of Plateau	

**Table 1.** Information on Commercial Products  
for Vegetation Control

<b>DuraZone (from Bayer Advanced)</b>		Application equivalent to 93 gallons/acre	
<b>Active Ingredient</b>	<b>Rate per acre</b>	<b>Notes</b>	
glyphosate	8 lb ae		
diquat dibromide	7.4 oz		
indaziflam	0.75 oz	(EsplAnade)	

# Table 1. Information on Commercial Products for Vegetation Control

Ground Clear (from Ortho)		Application equivalent to 726 gallons/acre	
Active Ingredient	Rate per acre	Notes	
glyphosate	44 lb ae		
imazapyr	11.7 oz ae	equivalent to 3 pt/ac Habitat	

# Percent Bare Ground

Percent Bare Ground

Trt. No.	Product Name	Rate	Rate Unit	50 DAT	143 DAT	429 DAT
1	Roundup ProMax	2	GAL/A	86	78	58
2	Roundup Extended Control	6.8	GAL/A	99	87	70
3	Roundup ProMax	2	GAL/A	100	85	53
	Plateau	12	FL OZ/A			
	Activator90	0.25	%V/V			
4	Dura Zone	5.45	GAL/A	99	88	60
5	Roundup ProMax	2	GAL/A	100	98	38
	Esplanade	3.6	FL OZ/A			
	Activator90	0.25	%V/V			

# Percent Bareground

## Percent Bare Ground

Trt. No.	Product Name	Rate	Rate Unit	50 DAT	143 DAT	429 DAT
6	Roundup ProMax	2	GAL/A	100	96	55
	Arsenal	3	PT/A			
	Activator90	0.25	%V/V			
7	Roundup ProMax	2	GAL/A	100	99	68
	Karmex DF	10	LB/A			
	Activator90	0.25	%V/V			
8	Roundup ProMax	2	GAL/A	100	91	77
	Oust XP	3	OZ/A			
	Activator90	0.25	%V/V			
9	Nontreated Check			30	33	30

# Herbicide Runoff From Bare Ground

- Should this be of concern to you?
- If so, how much herbicide do you think will move from the site?
- What percent of applied product do you think will move from the site?

Herbicide Runoff in Urban Landscape. 2000-2001.  
 Data are % of herbicide moving from application site

DAT	Pendimethalin		Prodiamine	
	Concrete	Turf	Concrete	Turf
0	0.2	Trace	Trace	0
7	5.6	Trace	4.9	0
14	0.6	Trace	0	0
28	0.2	Trace	Trace	Trace

Herbicide Runoff in Urban Landscape. 2000-2001.  
 Data are % of herbicide moving from application site

	2,4-D, MCPP, dicamba		Triclopyr, MCPA, dicamba	
DAT	Concrete	Turf	Concrete	Turf
0	22.8	0	13.5	0
7	3.8	0	3.4	0
14	0.6	0	0.1	0
28	0.6	0	0.3	0
Total	27.8	0	17.3	0

J. Stier, U. Wisc

# Grass Filter Strips Atrazine Trapping Efficiency

Filter Strip Length	Sediment	Water	Atrazine
15 ft	96 %	96%	93%
30 ft	99%	97%	99%
45 ft	99%	91%	93%

# Herbicide Resistant Weeds

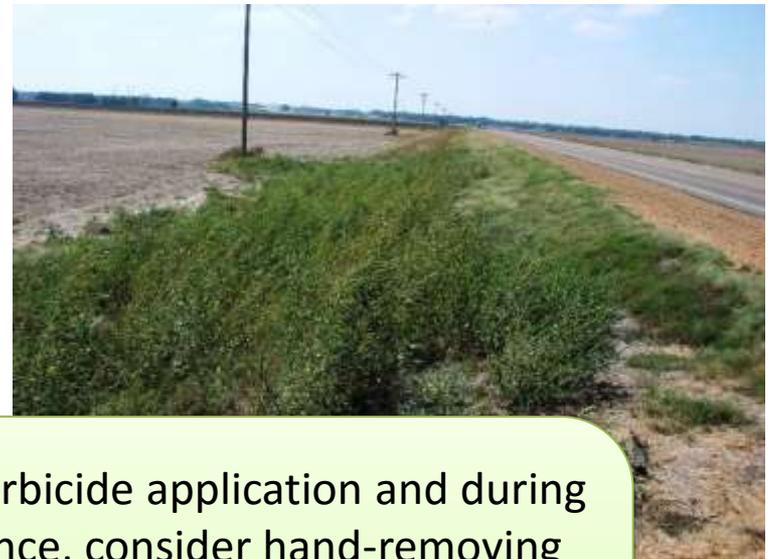
- Should this be a concern in bare ground areas?
- What do you think?

# Patterns of Herbicide-Resistant Weeds

Early years of herbicide resistance



Later years of herbicide resistance



When only a few plants survive a herbicide application and during the early years of herbicide resistance, consider hand-removing them and making adjustments to future weed management strategies. Waiting until numerous dense weed patches evolve during the later years of herbicide resistance can contribute to profit losses because of increased input costs.

# The Importance of Monitoring

Many factors can contribute to the presence of weeds in the right of way after a herbicide application and later in the season. Monitoring or scouting is the only way to know which weeds are present, and their patterns in treated areas can help to understand why they are present.

**Close monitoring will be helpful in documenting changes in the weed population that occur over time in response to land management practices, including the evolution of herbicide-resistant weeds.**

Changes in weed management practices based on a monitoring program help to:

- ✓ Reduce weed seed production
- ✓ Maximize remedial management tactics within the same growing season
- ✓ Plan alternative management strategies for future applications.





## Field Confirmation (Postemergence Foliar Herbicides)

### Flag In Treated Area

- Flag a **minimum** of 5, but preferably 20, of the healthiest weeds that survived the herbicide application.

### Flag Outside

- Find an area outside of the treated site that was not previously sprayed and contains the same species. Flag the same number of weeds.

### Spray

- Spray the weeds in both areas with the same herbicide in two strips – to one strip apply the labeled “rate”; to the second strip, spray the area with the labeled “rate” twice and label “twice the labeled rate”<sup>1</sup>.

### Evaluate

- Evaluate all plants 10 to 14 days after herbicide application.

# Diversity of Pra

The best strategies to manage herbicide resistance in weeds are established on the concept of diversity.

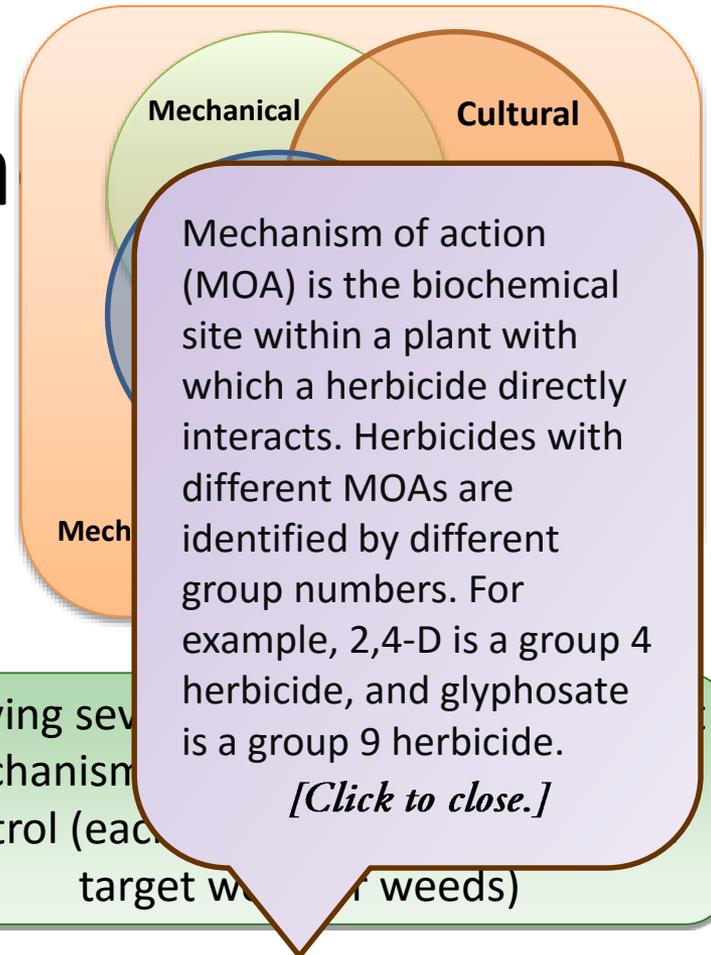
Diversity can be achieved by:

Using mechanical, cultural, and biological practices in addition to herbicides

and

Applying several mechanisms of control (each target weed)

A combination of tactics reduces the selection pressure imposed by any single practice.



# Proactive Management Tactics

Strategies to **proactively** delay herbicide resistance can include one or more of the following tactics:

## Cultural



- Plant ground covers adapted to the environment
- Fertilize during establishment to encourage rapid growth
- Sanitize equipment
- Avoid use of contaminated soil or mulch

## Mechanical



- Mowing
- Hand removal
- Mulching

## Herbicide



- Multiple herbicides with different mechanisms of action
  - Mixes
  - Sequence
  - Across seasons
- Combine with mechanical

Cultural



## Proactive Management: Cultural Tactics

**Sanitation.** Sanitation is one of the most often overlooked ways to minimize the spread of herbicide resistant weeds across the right of way. Equipment that has been used in areas heavily infested with herbicide resistant weeds should be cleaned to avoid spreading the seed. Similarly, soil that contains herbicide resistant weed seed should not be used for new construction or maintenance of existing rights of way.



**Ground cover selection and establishment.** Rights of way need ground covers that are low growing and easily maintained. Suitable choices should be adapted to the environment for the region. This includes the light received and rainfall amounts. Soil should be tested and fertilized during establishment to encourage rapid ground cover growth. Avoid moving herbicide resistant weed seed onto the site during establishment and after.

# Need for Full Label Rate

## Definitions:

- “Labeled rate” = A rate or range of rates set by herbicide manufacturers to consistently provide effective control of weed species across growth stages and site conditions.
- “Low rate” = A rate applied below the labeled rate that may provide effective control at an individual location, but will not provide consistent control over a wide range of conditions.

Routine exposure to low herbicide rates can allow a portion of the weed population to survive, leading to the evolution of herbicide-resistant populations.

## Weeds can be exposed to “low rates” due to:

- Intended use of low rates
- Spraying plants larger than those recommended on the label
- Inadequate coverage of weeds because of size, density and/or crop cover
- Inaccurate sprayer calibration, faulty or ineffective equipment, or mixing errors

## Mechanical



# Proactive Management: Mechanical Tactics

Mechanical tactics include techniques such as:

✓ Mowing

✓ Hand-removal

✓ Mulchers



Equipment sanitation is also important to slow the spread of herbicide-resistant weeds and weed seeds.

Questions?