

Japanese Stiltgrass Ecology and Management : A Report from the Stiltgrass Summit

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A stylized green illustration of a stiltgrass plant with several leaves and a small seed head, growing from a mound of soil.

2010 Stiltgrass Summit

River to River Cooperative Weed Management Area

August 11-12, 2010

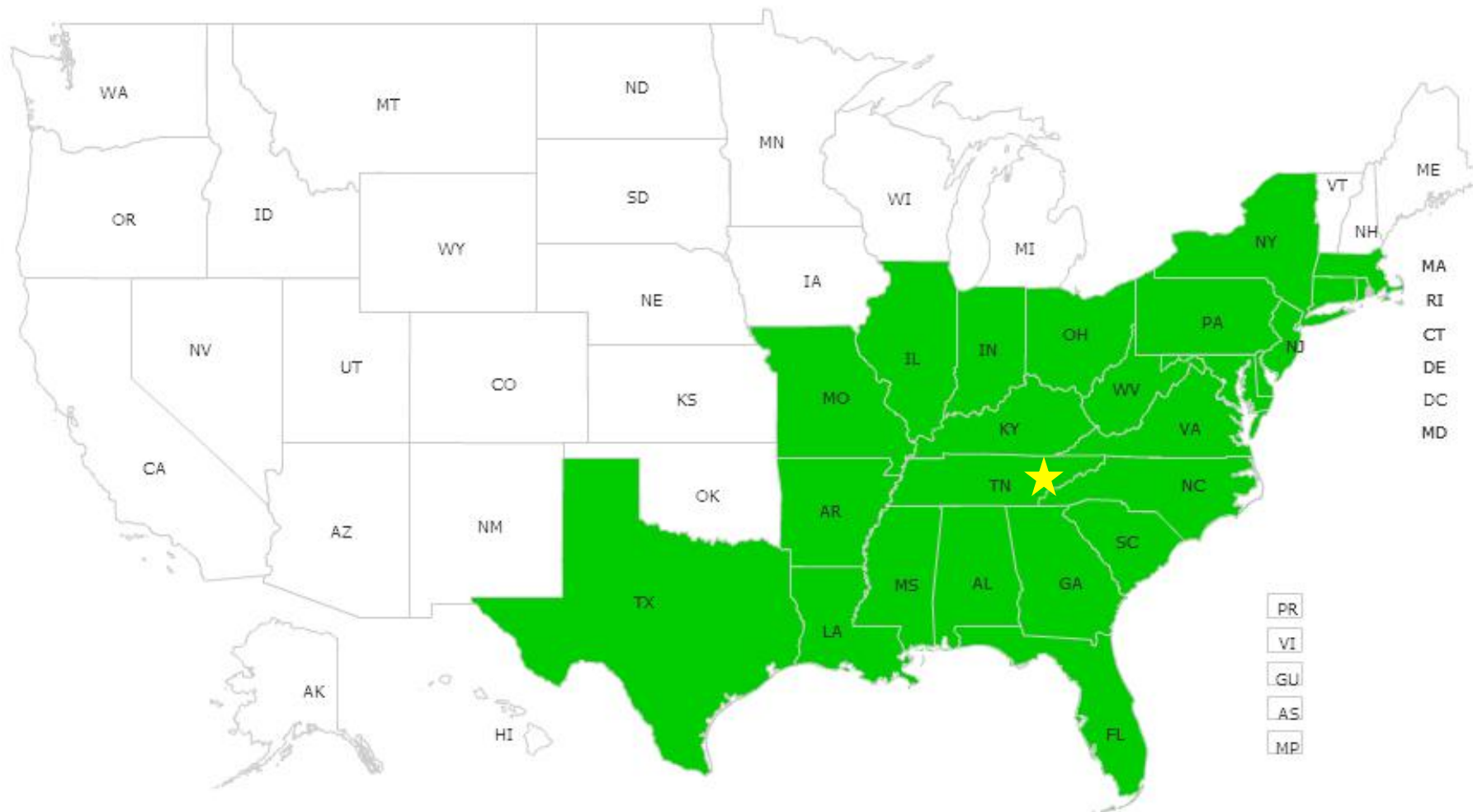
Carbondale, IL

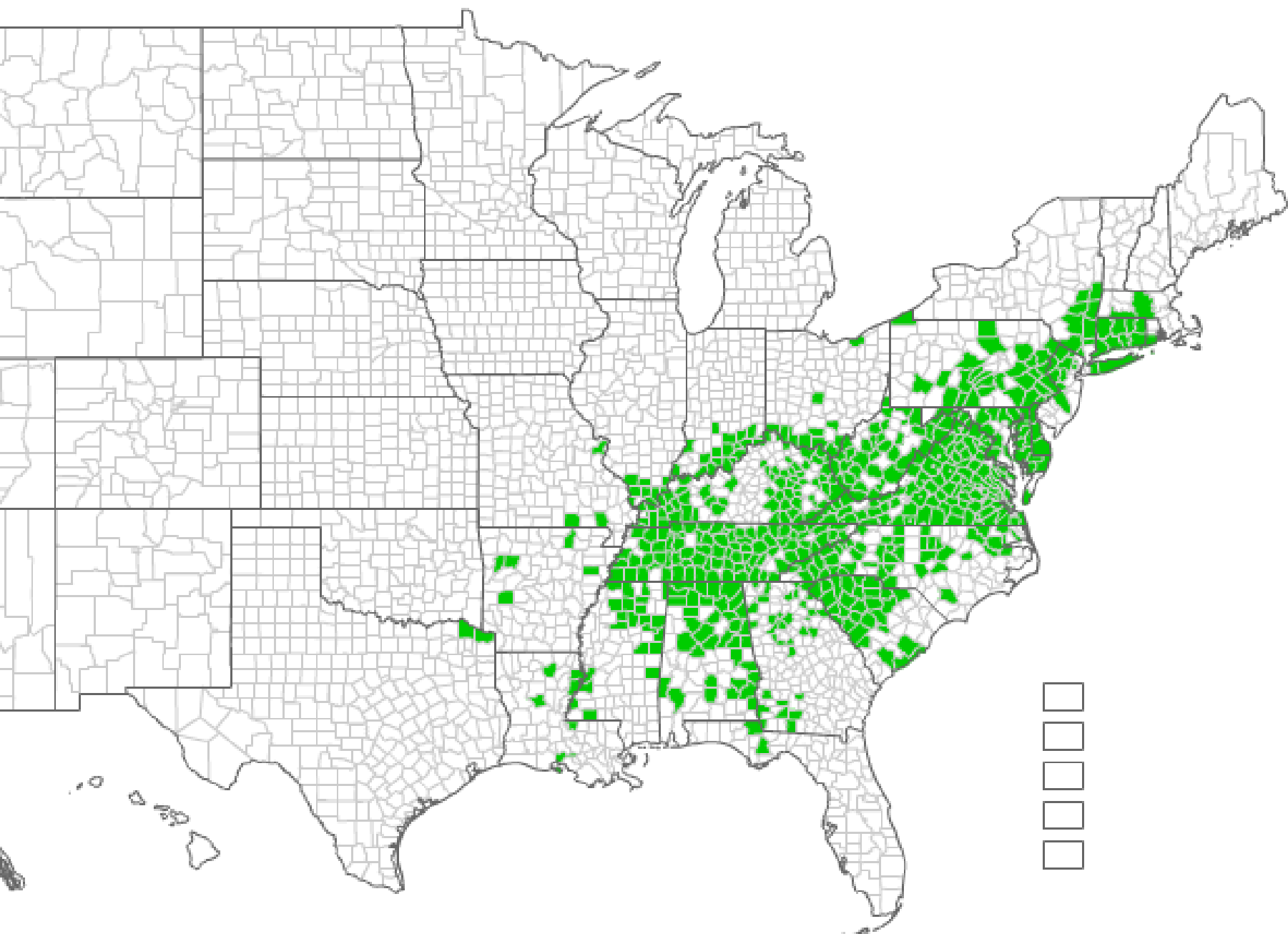
Japanese Stiltgrass

- *Microstegium vimineum*
- Nepalese Browntop, Eulalia, Chinese Packing Grass
- Annual, warm season, shade tolerant grass
- Native to Asia

Introduction

- First found in the United States in 1919 in Knoxville, Tennessee
- Accidental introduction
- Exact source not known, but suspected to have been used as packing material





Identification

Whole Plant

- Weak rooted annual
 - Pulls up easily
- 1-6 feet in height
- Sprawling, weak stems
- Longer stems prostrate along ground or propped-up





Identification

- Turns purple-brown in fall, starting at the top of the plant (hence the name 'Browntop')



Identification



Leaves

- Short, wide leaves
 - 2-4 inches long
 - $\frac{1}{2}$ - $\frac{3}{4}$ inch wide
- Whitish midrib
- Smooth edges (not serrated)

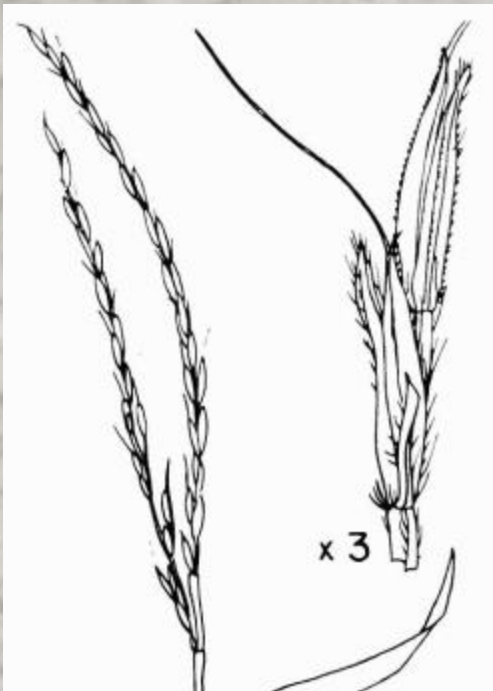
Identification



Identification

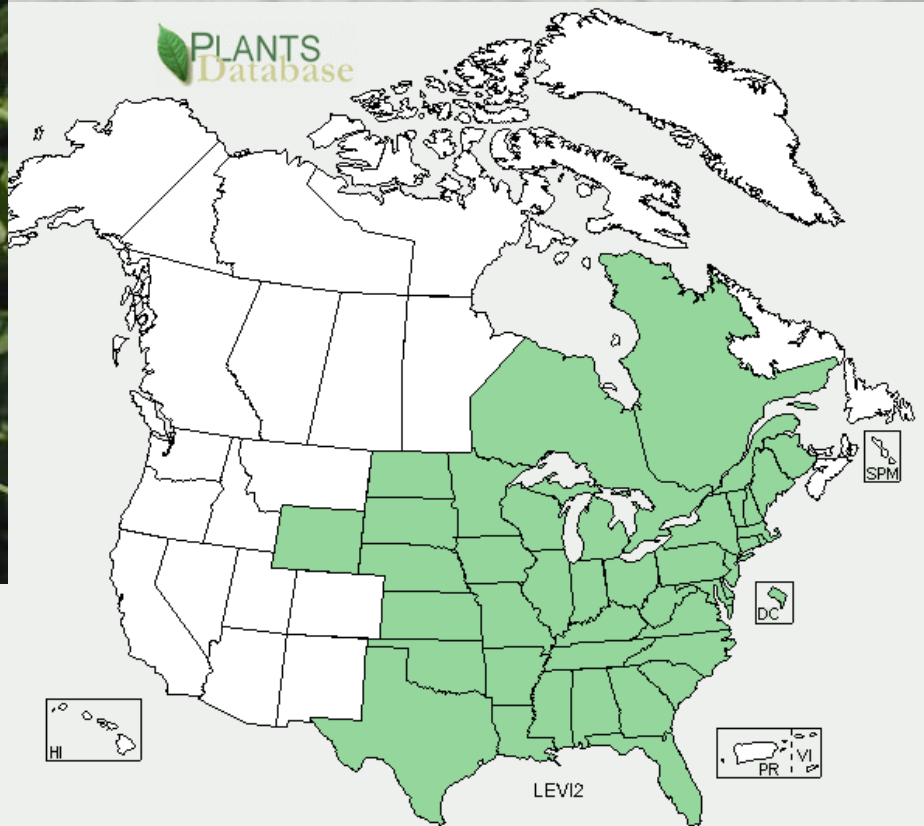
Flowers/seeds

- Thin raceme
- 1,2 or 3-branched on long, wiry stem



Native Look-alike

- White grass (*Leersia virginica*)



Leersia virginica

- Perennial, rhizomatous woodland grass
- Often grows with Japanese stiltgrass
- Also has white midrib, but leaves are usually much longer
- Has bearded nodes; they are smooth on Japanese stiltgrass
- *Leersia* is rare in some places, so make sure you ID Japanese stiltgrass properly before removal

Phenology

- Late spring – seeds germinate
- Summer – peak growth
- Late summer / early fall – flowering
- Early fall – Seed set
- Mid-late fall – Senescence



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Ecology

- Has terminal (open, chasmogamous) and axillary (closed, cleistogamous) flowers
- Seed set varies greatly depending upon local conditions
- May not set seed in drought conditions

Ecology

- Grows in a variety of habitats
 - Deep shade to full sun
 - Moist soils to dry conditions
- Does best in semi-shaded environment with adequate soil moisture
- Seeds can be viable for a long period (7-10 years), but most germinate in first two years
 - Differs by seed type and local conditions

Ecology

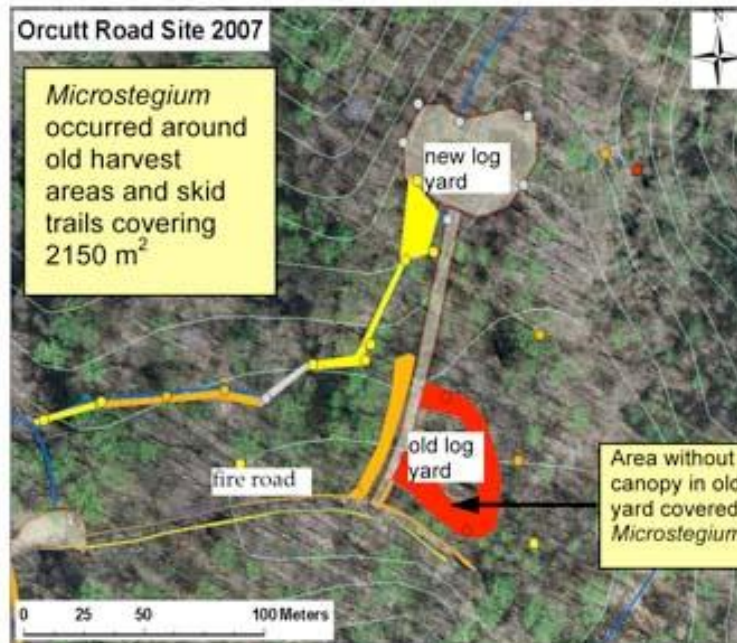
- Invade forests, forest edges, roadsides, ditches, etc.
- Has the ability to dominate forest understory plants
- Does not compete well in open system with perennial plants

Ecology

- Spring fires seem to promote stiltgrass
- Other disturbances

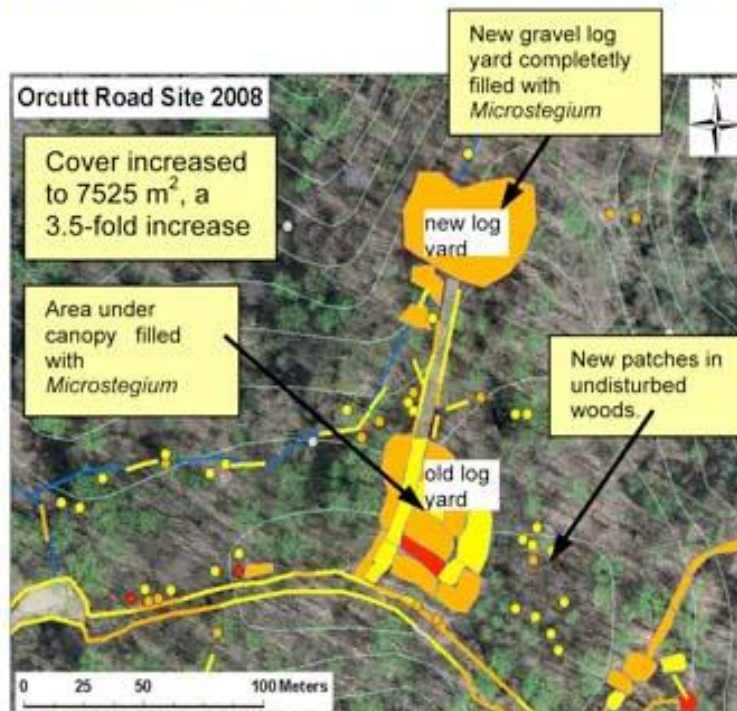


Angie Shelton,
Indiana
University



2007

one year change in population occurrence



2008

LEGEND

- cleared for harvest activity
- skid trail

Microstegium Density

- 0 – not present
- 1 – scattered plants
- 2 – continuous patch mixed with other species
- 3 – continuous patch with no other species

Impacts

Scott Meiners, Eastern Illinois University:

- Site almost always experiences a decrease in diversity following stiltgrass invasion
- Areas with higher species richness and more herbaceous cover were more quickly invaded
- With stiltgrass invasion, there was an average loss of 2 species per plot over 8 years

Impacts

- Stiltgrass invasion reduces tree seedling density, partly due to shading
- Stiltgrass infestations can drastically alter nitrogen cycling and microbial communities
- Stiltgrass may be allelopathic

Impacts

- Unpalatable, may decrease forage
- May provide cover for small rodents, which could increase herbivory on tree seedlings
- Heavy thatch layer restricts soil contact for other seeds
- Alter fuel conditions for prescribed fire

Fire Hazards



Spread

- Still actively expanding its range
 - Water
 - Gravity
 - Animals
 - Humans
 - Equipment
 - Roads
 - Shoes
 - Materials





 2010
Stiltgrass
Summit
River to River Cooperative Weed Management Area



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Spread

- Stiltgrass closely follows disturbance
 - Logging roads
 - Fire breaks
 - Trail construction
 - Logging
 - Other invasive control

Management and Control

- Easy to kill, hard to eradicate
- Pulls easily
- Variety of herbicides work
 - Broad spectrum - Glyphosate (1-2%)
 - Grass specific – Sethoxydim (0.75 – 1.5%)
 - Pre-emergent – Pendimethalin

Management recommendations (Flory)

Method	Recommended?	Notes
Fire	NO	Not currently recommended; more information is needed to determine if properly timed fires might help control invasions
Glyphosate (e.g. RoundUp)	NO	Results in damage to native species; equally effective selective herbicides are available
Grass-specific herbicides	YES	Mix 22 ml herbicide with 15 ml surfactant and apply at 40 psi with a backpack sprayer
Hand-weeding	YES	Practical only for very small invasions, must be repeated throughout season
Mowing	YES	Can be used late in the season when plants begin to flower but before seed has matured; must be repeated yearly
Pre-emergent herbicides	NO	Effective at eradicating invasions but prevents establishment of native species

Chemical Control

- Wetlands and streamsides limit what type of chemicals you can use
 - Aquatic-label glyphosate (Rodeo, Aquaneat)

Mechanical Control

- Post-treatment equipment sanitation is a **MUST**
- If flowers are present, then plant material should be bagged and removed

Management and Control

- Key is to conduct control efforts before flower initiation or seed set
 - Being an annual, your goal is not to kill the plant, it is to prevent seed production
- Think about landscape level infestations
- May be a waste of money to control stiltgrass in one area if infestations occur farther upstream in the watershed

Prevention

- Early Detection / Rapid Response
- Equipment sanitation
- Infestation avoidance
 - Re-routing firebreaks
 - Pre-logging treatments
- Changes in firelines
 - Green lines
 - Blown instead of plowed lines

Regional Management

- Rapid spread of stiltgrass and linear spread corridors require coordination partnerships
 - CWMAs
 - Watershed projects
 - DOT/Highway departments
- Prioritization
 - EDRR events
 - High use areas (spread potential)
 - Threats to resources

Regional Management

- Source – sink dynamics
- Roadsides may be serving as source populations
- Focused control in this area may greatly reduce spread potential and allow smaller, adjacent infestations to no longer be sustaining

Regional Management

- Public Awareness
- Agency training
- Accurate and timely mapping
- Early detection reporting
- Develop coordinated efforts BEFORE stiltgrass becomes a problem

For more information:

- River to River Cooperative Weed Management Area, www.rtrcwma.org
- Midwest Invasive Plant Network, www.mipn.org