

# Promoting invasive plant control on roadsides



# **I want you to come away with the following:**

- Understanding of why we call a plant invasive
- How to identify wild parsnip
- How to use imazapic + metsulfuron to reduce grass height
- How to use information to promote invasive plant control on roadsides



# What is an invasive species?

Two main points

**1. Not native to the area**

**2. Capable of causing harm**

- *Environmental*
- *Economic*
- *Harm to human health*





**Weeds can be a problem too but are not INVASIVE PLANTS.....**





# Invasive plants are bad and impact roads



- Harm to human health
- Impact infrastructure
- Prevent establishment of desired vegetation
  - Pollinators
  - Erosion increased





# Roadsides are highly susceptible to invasion

- Frequently disturbed
- Propagules spread along roads
- Intersect many properties



# Often management is easy, but.....

- Mowing for 3-4 consecutive years can eliminate
  - **BUT** mowing must be done in a 2-4 week period
- One herbicide application can provide two years of control
  - **BUT** cost extra \$\$\$\$ , may injure other plants/crops, community may not support

If nearby populations near roadside are not managed,  
effort will be required indefinitely

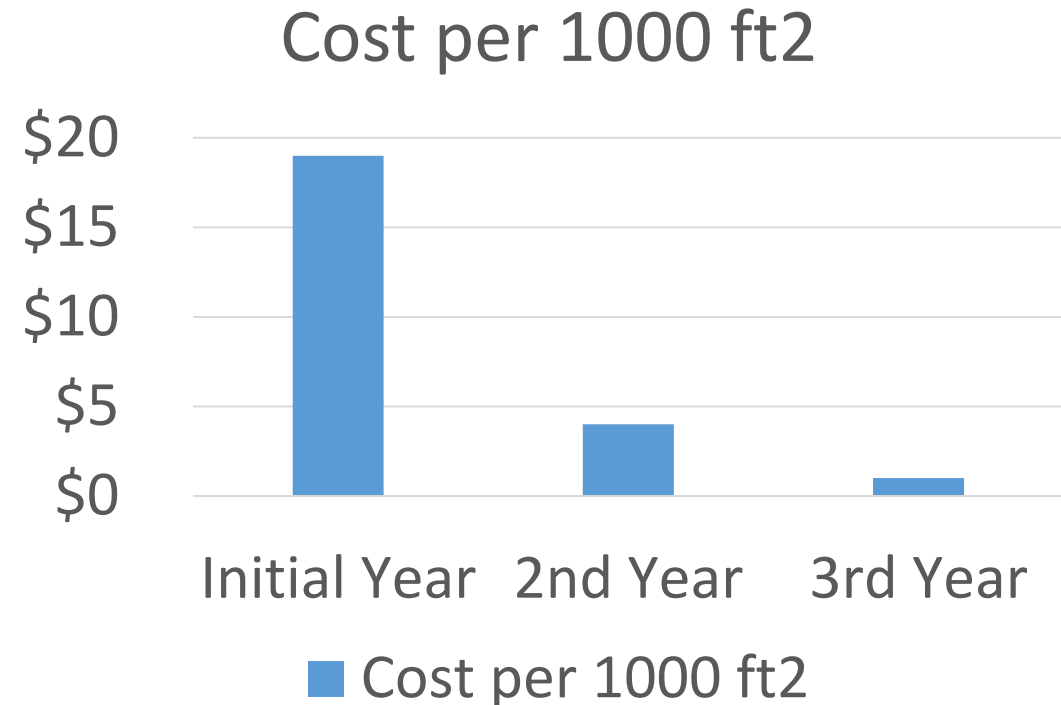




# But some species can be really expensive to treat!

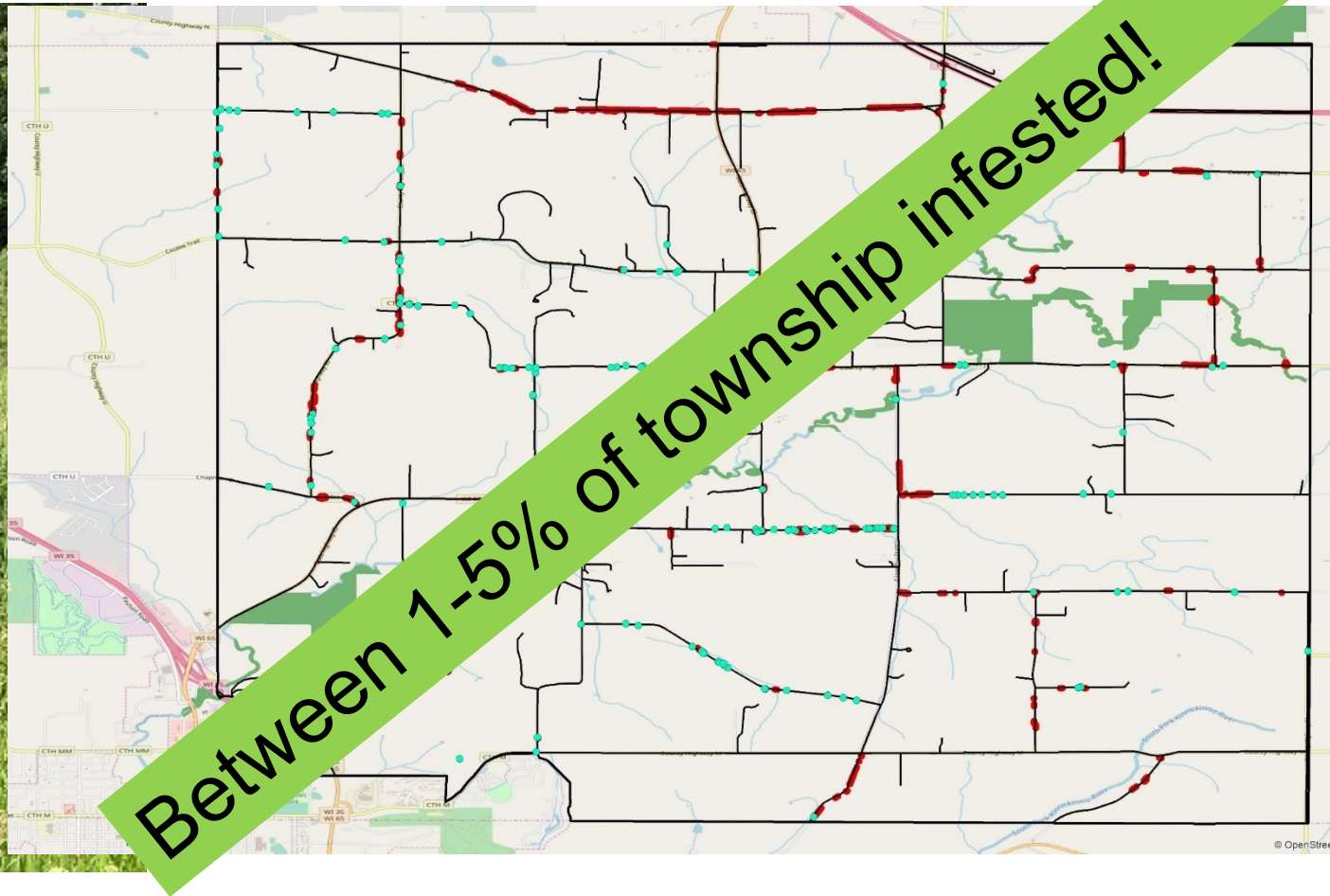
## *Bohemian knotweed (aka Japanese knotweed)*

Suppression over 3 years = \$25/1000 ft<sup>2</sup> or \$1,000/A





# infestations are typically localized to specific roads





# Some roads are dominated



Wild chervil



Wild parsnip (*Pastinaca sativa*)



# Few Tools Available for Large-scale Use

**MOWING**



**HERBICIDE**



**REMOVAL**





# Hand Removal (Severing Root)

- How it works: kills plants if not a perennial
- When: anytime before flowering
- Costs= depends on weed density
  - Demonstrations were \$122/A\*
- Considerations
  - Can you get volunteers?





# Herbicide

## Individual plant treatments

- How it works: kills plants
  - Prevents seed production for 1 year
- When to spray: species specific, flexible
- Costs to spray= depends on weed density
  - Demonstrations ranged between \$13-87/A\*
- Considerations
  - avoids damage to desirable plants, minimizes off-target injury

## Broadcasted treatments

- How it works: kills plants
  - Prevents seed production for 1-2 yrs
- When to spray: species specific, flexible
- Costs to spray= \$12-65/A\*
  - \$2-35/A = + application costs (\$10-30/A)
- Considerations
  - off-target injury is higher



# Mowing

- How it works: reduces competition, prevents seed production
  - When to mow: species specific
  - Costs to mow
    - \$70-150/lane mile
  - Considerations
    - Mowing time is 2-4 week timeframe
- \* 1 acre = 1.2 miles road (10 ft swath)





# What happens if you mow early

**Mowed 6/14 (2 wks early)**

**Picture taken 6/25**

- Plants readily resprout and flower
- Will produce viable seed if not mowed again
- Mow as late as possible to reduce resprouting
  - Some species, only need 1 mow/yr (wild parsnip),





# What happens if you mow too late

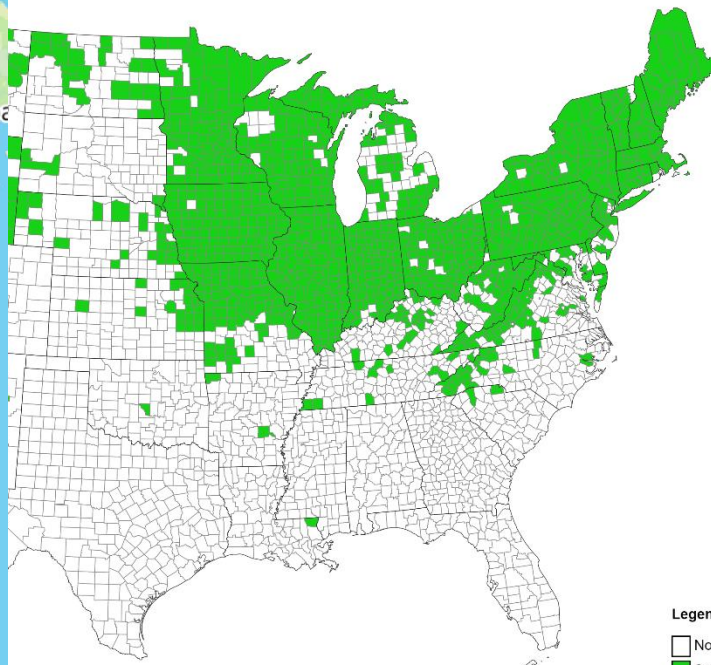
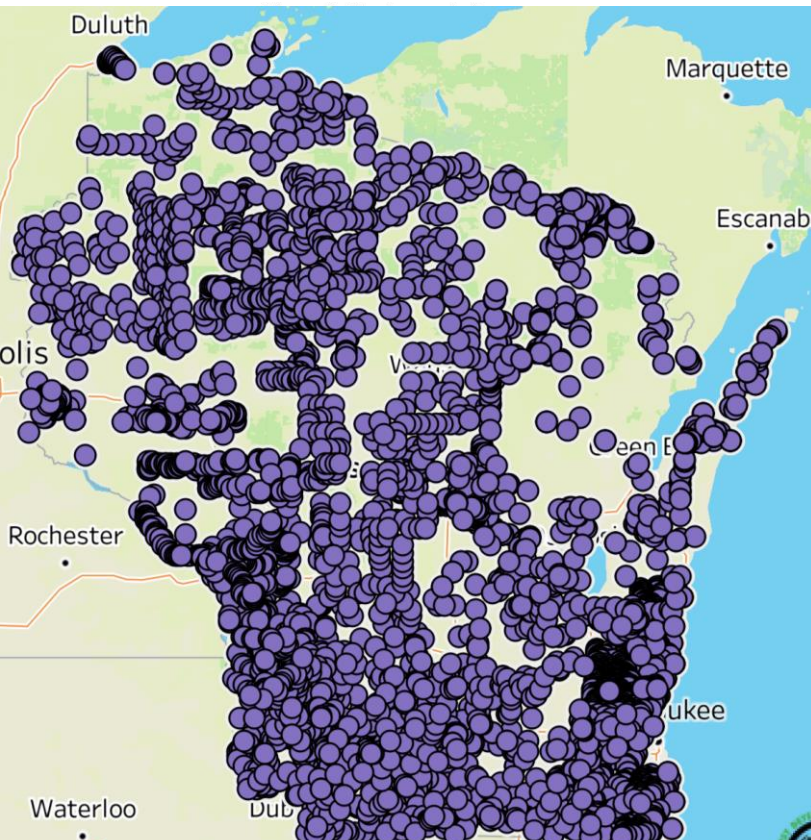
- Spread seed along roadside
- Teasel dispersal on roadsides:
  - Most seed <30 ft but some > 50 ft
  - Population can spread 800% in two years
- Illegal with regulated species





# Will focus on wild parsnip

- Biennial to short-lived perennial
- Reproduces by seed
- Most common invasive in WI roads



EDDMapS  
find • map • track

Legend  
□ No Data  
■ Species Reported





# Have you seen this plant before in Kansas?

- A) Yes, it is common
- B) Yes, I have seen it once or twice
- C) Never seen it before
- D) Don't know how to identify





# Wild parsnip ID

## *Leaves*

- Alternate, pinnately compound leaves
- Leaves have 2 to 5 pairs of
  - opposite, sharply toothed, lobed leaflets.





# Wild parsnip ID

## *Stems/Flowers*

- **Stems:** Smooth, *hollow*, *grooved* that can reach 5 feet in height
- **Flowers:** Yellow, in flat-topped umbel clusters. Primary, secondary, and tertiary flower-heads can occur





# The biggest problem in WI is time and \$\$\$\$

- Managers have constraints that limit management
- In Wisconsin constraints:
  - Knowledge
    - identification/ management
  - Enforcement
  - Equipment/capacity
  - **Funding to implement**

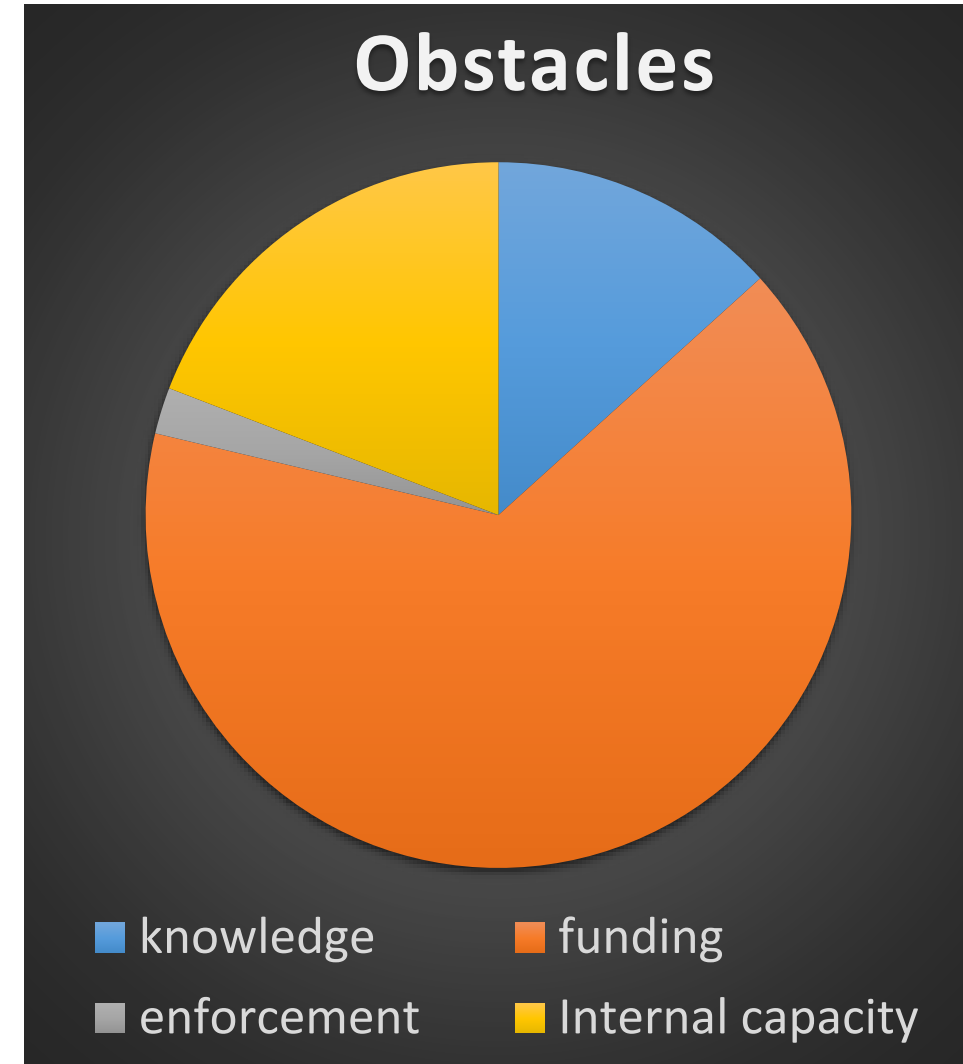


Wild parsnip (*Pastinaca sativa*)



# Past work, has had limited success

- Classroom training: for state highway workers
  - Identification
  - Management options
  - How to “be legal”
- While improved knowledge
  - **Did not see any changes to management**
- **Obstacles were not overcome!**





# Our efforts in 2019

## Engaging ROW stakeholders

- Educated key issues
  - Identification, regulation, biology
- Demonstrate effective methods
  - Side by side, small and largescale
- Focused on obstacles and how to overcome
  - Reduce mowing to save \$\$ in managing roadsides and apply to invasive plant control





# How often are roadsides mowed annually in Kansas?

In Wisconsin one mowing costs \$75-150/A

- A) once
- B) twice
- C) three times
- D) more than 3x
- E) Don't know

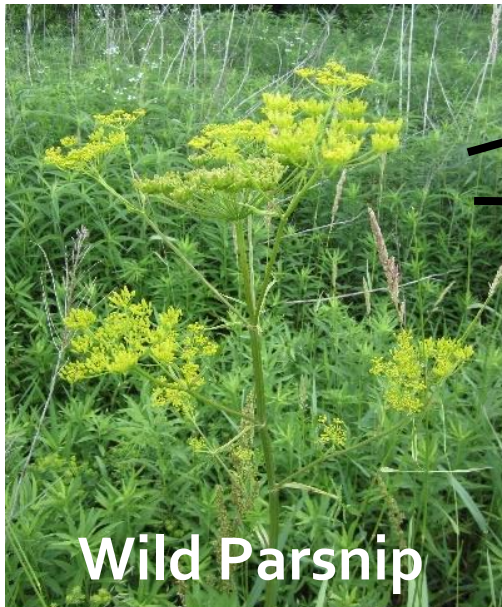




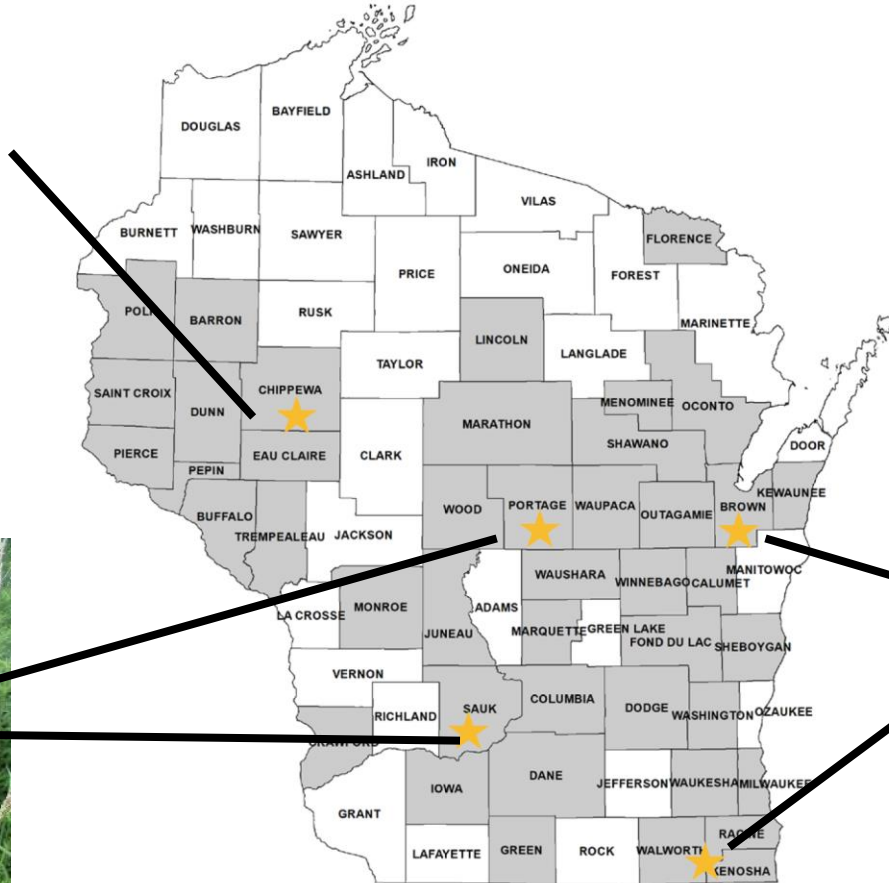
# 5 Invasive plant roadside workshops



Wild Chervil



Wild Parsnip



Teasel



233 Attendees managed > **19,000 centerline miles of road** (17% of all WI roads)



# The focus was on overcoming obstacles and increasing action

classroom

small plot demonstrations common practices

largescale demonstrations





# Summary of results

**Table 1:** Effectiveness of herbicide treatments

Herbicide Treatments with > 90% control on all target species (rate)	Cost
Escort (0.5 oz/A) + NIS** (0.25% v/v)	\$
Opensight (2 oz/A) + MSO* (1% v/v)	\$\$
TerraVue (2.85 oz/A) + MSO* (1% v/v)	\$\$
Method (8 fl oz/A) + MSO* (1% v/v)	\$\$\$
*MSO = Methylated Seed Oil, ** NIS = Non-Ionic Surfactant	



**Plateau + Escort:**  
Effective control

Applications of Plateau (imazapic) at 0.5 oz/A, Escort (metsulfuron) at 0.75 oz/A, and MSO at 8 fl oz/A applied in May (ideal timing is when wild parsnips are blooming) to reduce grass height showed no visual injury to wild parsnip, but decreased height of grass for 1-3 months depending on grass species present. This application maintained smooth brome height 1-2 feet from May through August (6% reduction) (see photo below).

At another location dominated by smooth brome grass, this application only kept grass height below two feet for one month. Therefore, while applications are reducing grass height, the suppression will vary.

Applications also provided excellent (>90%) control of teasel, wild chervil, and wild parsnip throughout 2019. Based on these results, we estimate applications of Plateau + Escort will save 1-2 mowings per year, saving \$50-\$150 per lane.



Reduction and wild parsnip control (yellow) at one month after treatment using a combination of Plateau + Escort.

**Table 2:** Mowing timings for targeted invasive plants, teasel, wild chervil and wild parsnip. Optimal timing may be 1-2 weeks later in northern WI.

May	Jun	Jul	Aug	Sep	Oct	Nov	
	OK	OPTIMAL		DO NOT MOW			TEASEL
OPTIMAL				DO NOT MOW			WILD CHERVIL
	OK	OPTIMAL		DO NOT MOW			WILD PARSNIP





# How did we address lack of funding?

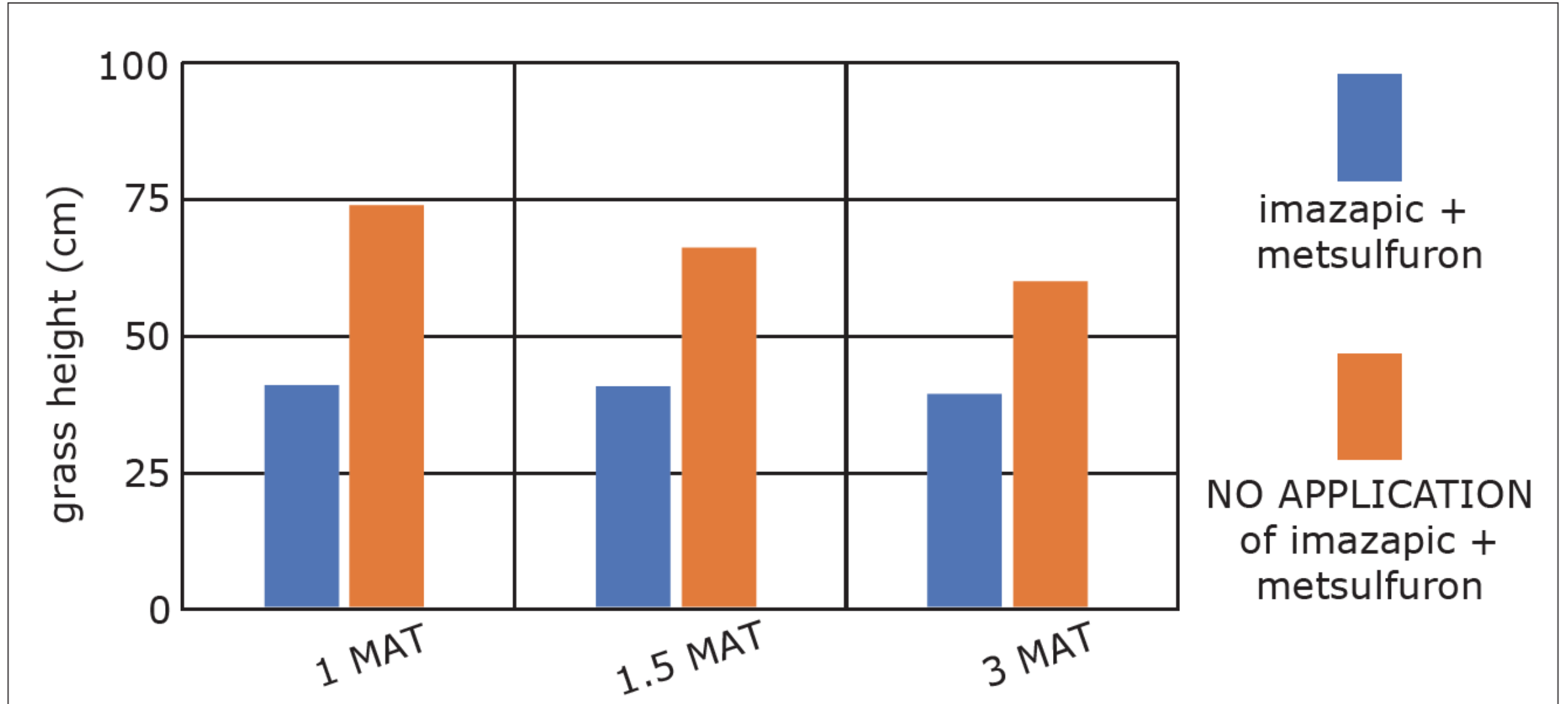
- Use imazapic + metsulfuron to reduce grass height
  - Plateau (4 fl oz/A + Escort 0.75 oz/A) in May
  - Demonstrated method in plots
  - Costs \$20-40/A
- Can eliminate 1-2 mowings
  - Mowing costs >\$75/A
- SAVE >\$30/A in vegetation management costs if implement
  - Use the money for invasives





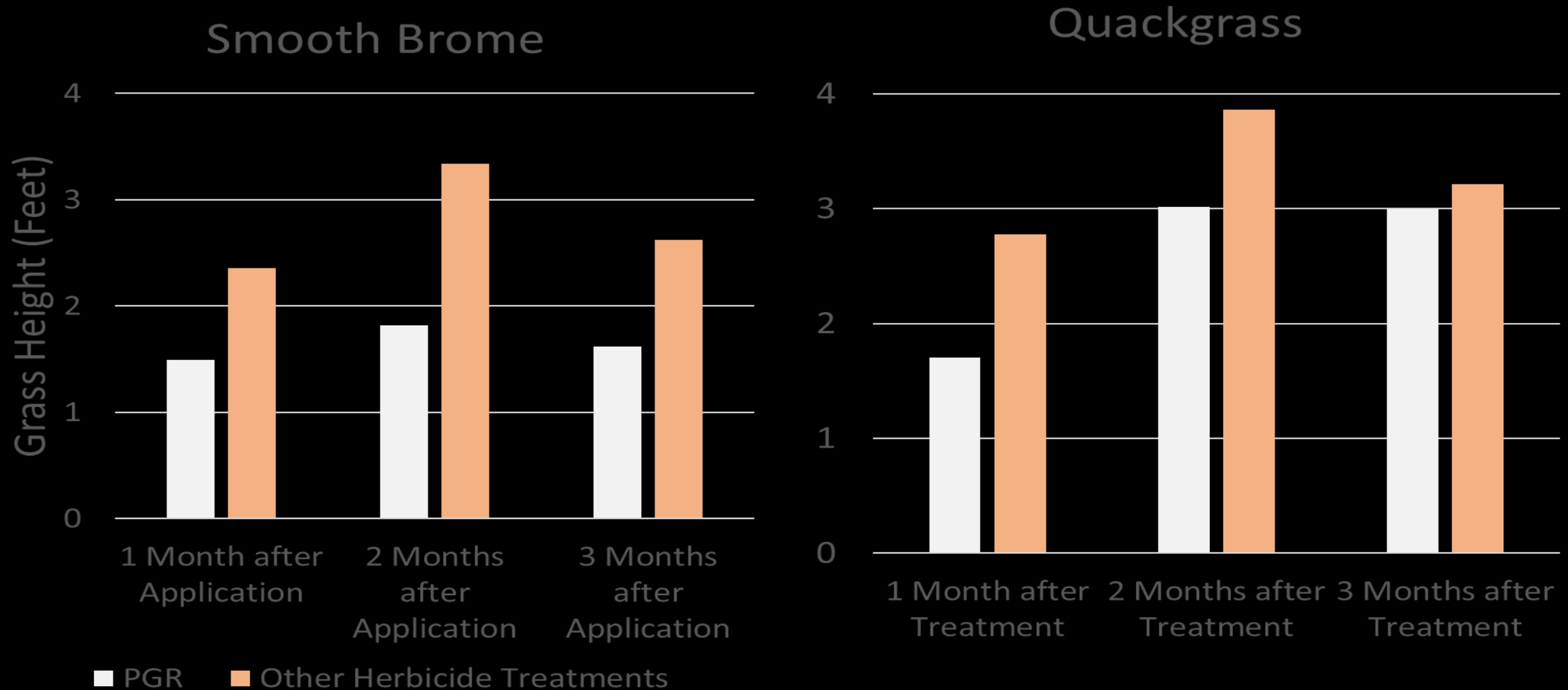


*Figure 2: Grass height impact from  
imazapic + metsulfuron*





# Response may be specific to grasses present





# These herbicides also have activity on some invasive plants

- > 90% wild parsnip and wild chervil control 4 MAT
- comparable to top-performing herbicides





**Don't expect these to be effective on all  
invasive plants**

**Japanese Knotweed**



**Phragmites**





# We then focused on how to use this information

- If limited by funding consider using imazapic + metsulfuron
  - Apply to areas difficult to mow on-time
  - use \$\$\$ saved to increase other invasive activities
- If capacity limited
  - Use imazapic + metsulfuron to reduce mowing frequency
  - Hire contractors to spray/mow with cost savings
- Pull in key stakeholders prior to implementing
  - Develop a plan with clear goals
  - Allow for public participation



# Was it a success?

- People that attended managed > 19,000 road miles
  - 20% of WI roads
- improved knowledge of individuals that attended
  - 1.3 to 2.4 (0-3 scale)
- 93% intend to change management
  - mapping invasive plants (14,364 road miles)
  - changing herbicide application method/timing (12,334 road miles)
  - invasive species management plan (12,106 road miles)



**Couldn't have done it if it wasn't a  
coordinate approach!**





**Which of the following is required to call a plant an “invasive plant”?**

- A) competitive
- B) not eaten by insects
- C) undesirable
- D) not-native to the area

# Resources to assist in control

## University of Wisconsin Extension (UWEX)

- <https://renzweeds.cals.wisc.edu/>

## Midwest Invasive Plant Network

- ([www.mipn.org](http://www.mipn.org))
- google mipncontroldatabase



Brandon Panke and Mark Renz

**I**nvasive plants can thrive and aggressively spread beyond their natural range, disrupting ecosystems. The *Management of Invasive Plants in Wisconsin* series explains how to identify invasive plants and provides common management options. Management methods recommend specific timings for treatment, as well as expected effectiveness. For more information, go to: [fyi.uwex.edu/weeds/category/invasive-plants-of-wisconsin](http://fyi.uwex.edu/weeds/category/invasive-plants-of-wisconsin).

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### Japanese knotweed (*Polygonum cuspidatum*)

Japanese knotweed is an herbaceous perennial, growing up to 10' tall. Hollow, reddish, arching, bamboo-like stems are smooth and stout, and they can persist after plant dies back each year. The base of the stem above each joint is swollen and surrounded by a membranous sheath (ocrea).

**Legal classification in Wisconsin:** Restricted

**Leaves:** Alternate, egg-shaped to almost triangular, 4-6" long, 3-4" wide. Dark green on upper surface and pale green on lower surface.

**Flowers:** Bloom in late summer. Flowers are numerous, highly branched, tiny, creamy white or greenish and found where the leaf attaches to the stem (axils), near the tips of stems.

**Fruit and seeds:** Small, winged, triangular fruits carry very small, shiny seeds.

**Roots:** Plants arising from seed have a taproot up to 6' deep. Stout rhizomes can reach 48" or more from parent plants and give rise to new stalks. Plants arising from seed and rhizome also have fibrous roots.

Similar species: Giant knotweed (*P. sachalinense*) is also invasive, but grows up to 13' tall with larger leaves. The two species are known to hybridize.

**Ecological threat:**

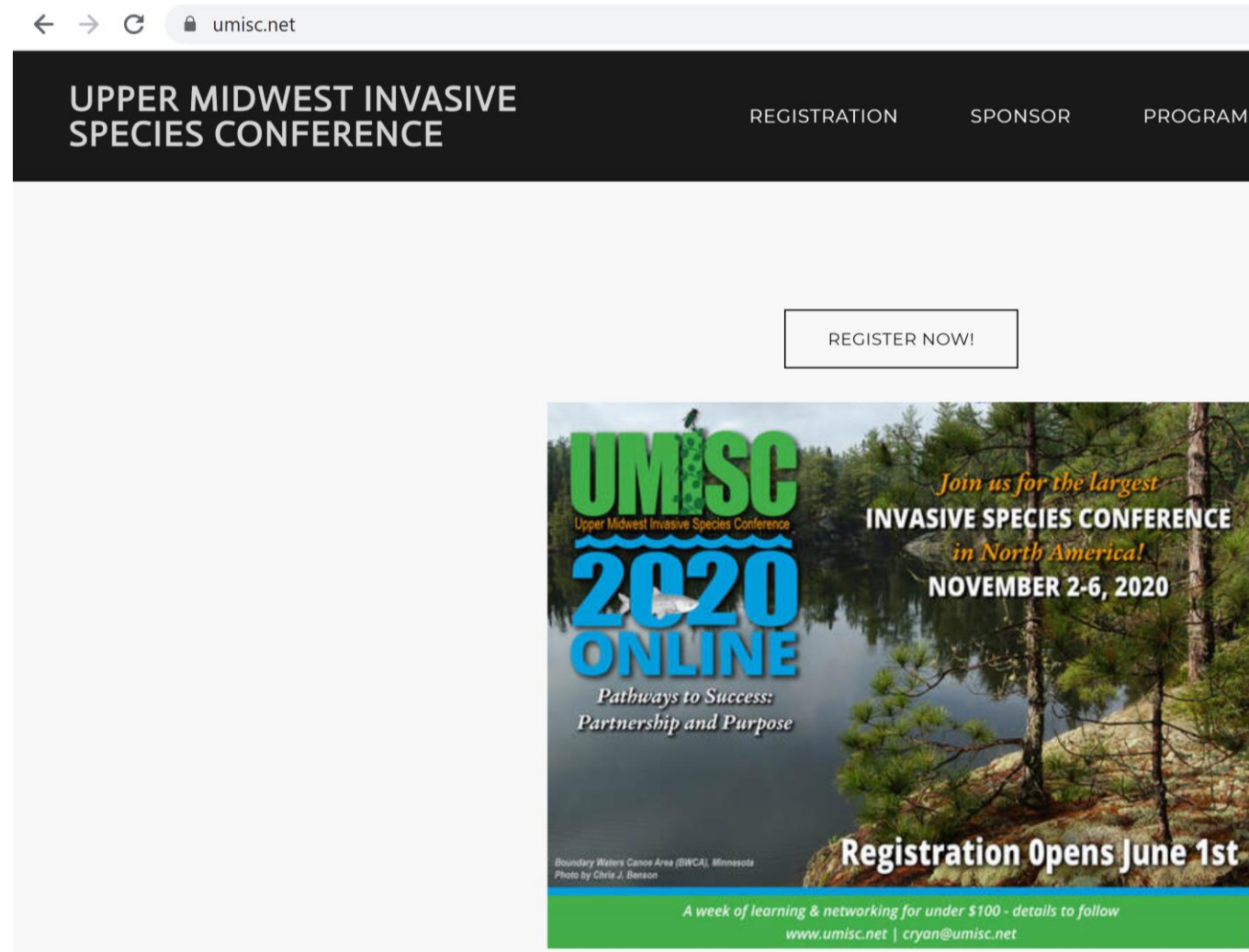
- Invades upland and lowland sites that are disturbed and undisturbed.
- Poses a significant threat to riparian areas, where it can rapidly spread.
- It tolerates shade, high temperatures, high salinity, and drought.
- It can be transported to new sites as a contaminant in fill dirt or on equipment. During floods, it spreads downstream by shoot fragments, rhizomes, or occasionally by seeds. Escapes from neglected gardens and discarded cuttings are common routes of dispersal from urban areas.
- Although reported to not produce viable seed, several studies have shown that populations of knotweed in the United States can produce viable seed that readily germinate and survive in field conditions.





# If want more information, consider attending UMISC!

- [www.umisc.net](http://www.umisc.net)
- Online November 2-6<sup>th</sup>
- Information on invasives across all taxa and areas
- Registration costs \$95 (10/30 deadline)
  - Discounts available
- Woody invasive portion free 5<sup>th</sup>-6<sup>th</sup>
  - [Woodyinvasives.org](http://Woodyinvasives.org) to register



# Questions

