Targeted Applications of Triclopyr to Manage Woody Encroachment of *Fraxinus pennsylvanica*

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Tallgrass Prairie Remnants

• 2% of Minnesota’s native tallgrass prairie remains
• Previously covered 1/3 of Minnesota
  • Most has been converted to agriculture
Woody Encroachment

• Historically controlled by wildfires and grazers
• Big problem in Minnesota’s tallgrass prairies
  • *Fraxinus pennsylvanica* (green ash)
  • *Rhus glabra* (smooth sumac)
  • *Rhamnus cathartica* (common buckthorn)
Research Plot

• 100x58m

• Long term experiment on purple coneflower (*Echinacea angustifolia*) being conducted

• 3 of 4 sides are surrounded by adult *F. pennsylvanica*
  • Seeding within plot nearly constant

• Many trees within the plot are regrowth from multiple controlled burns and previous treatments

Is there an effective way to manage adolescent trees without damaging the surrounding area?
How Does Triclopyr Work?

• Auxin (Andole acetic acid) mimic
• Interferes with cell growth and division
• The ester causes degradation in sunlight and binds excess runoff to the soil
  • Half-life in natural systems is about 7 days
• Has little impact on grasses
• A large amount must be applied to be effective
Application Types

• Treatment 1: Foliar application
  • Back faces of all leaves painted with a sponge brush
  • Intended to simulate spraying

• Treatment 2: Cut
  • Trees were cut down to 10 cm above groundline and herbicide applied to cut surface

• Treatment 3: Cut and Bark Peel
  • Trees were cut down to 10 cm above groundline and bark was peeled away with a knife
  • Intended to approximate wedge technique
Assigning Treatments

Foliar- 188 total individuals
Cut- 137 total individuals
Peel- 113 total individuals

438 individuals across 31 sections were treated over a 12-day period in late July and early August.
Results

ANOVA determined significant differences between all treatments
• P-value << 0.01

Mean Proportion of Dead Stems

0.0 0.1 0.2 0.3 0.4

Foliar Cut Peel

A B C
Constraints

• Ideal application times: early spring or late fall
  • I applied in mid summer

• Can become volatile above 85°F
  • There were several days that I applied that were warmer

• Data collection occurred 3 weeks after treatments applied
  • Results that were more long term would be useful
Future Research

• Follow up data collection
• Late fall and early spring applications
• Different herbicides
Questions?