




Microstegium vimineum Management and Impacts on Native Plant Communities

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Microstegium vimineum

- Japanese stiltgrass
- Summer annual invasive grass (Poaceae)
- C₄, shade-tolerant
- Wetlands, woodlands, utility easements, lawns, landscapes




Objectives

- To use an biological and ecological based research program to make sound management recommendations for Japanese stiltgrass

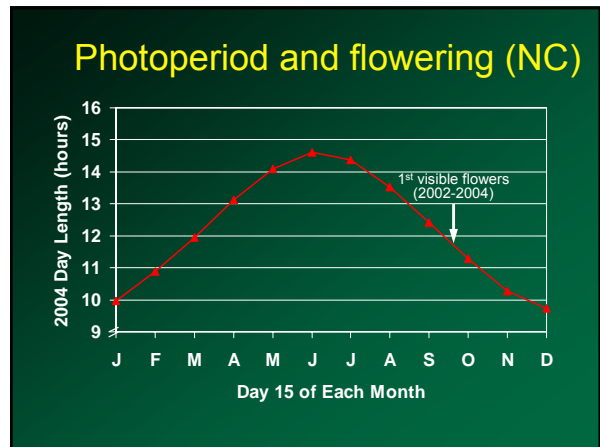
Current management guidelines



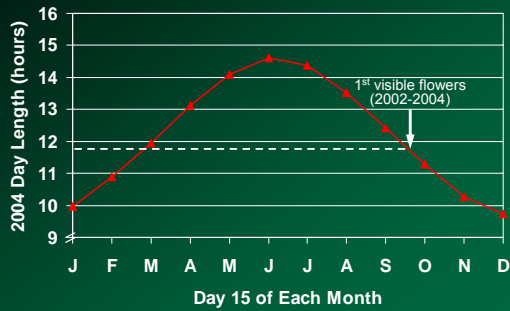
- Prevent seed production (Tu 2000)
- Methods (late-season)
 - Hand-removal
 - Mechanical (mow)
 - Nonselective herbicide (Roundup Pro – glyphosate)

Questions and concerns?

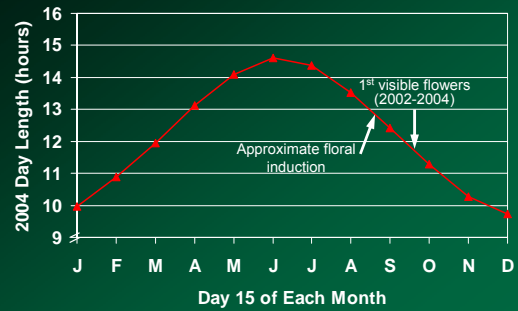
- Late-season control allows competition to reduce native species
- Non-selective methods (Roundup and mowing) kill native species
- Management must be timely



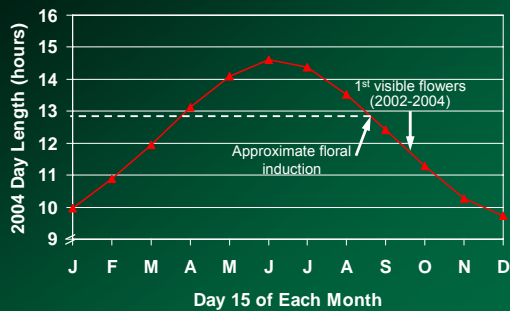
Photoperiod and flowering (NC)



Photoperiod and flowering (NC)



Photoperiod and flowering (NC)



Seed development



Oct. 7



Oct. 21



Nov. 2



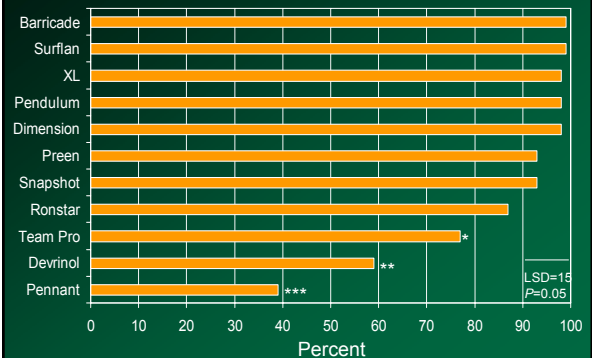
Nov. 14

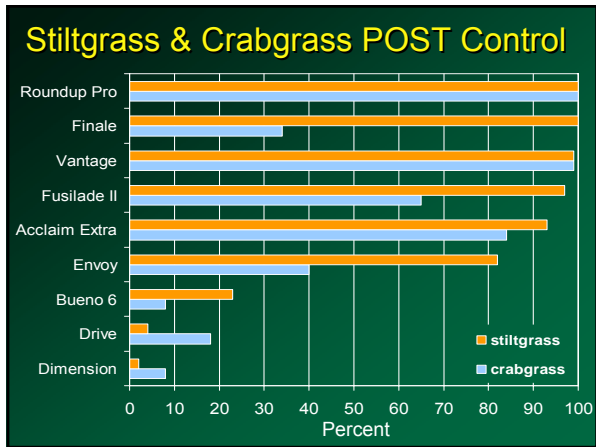
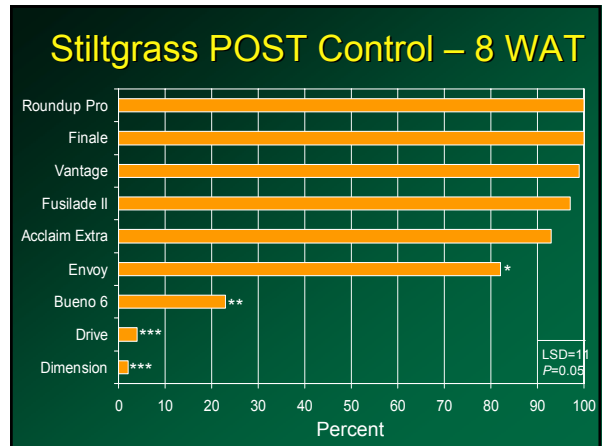
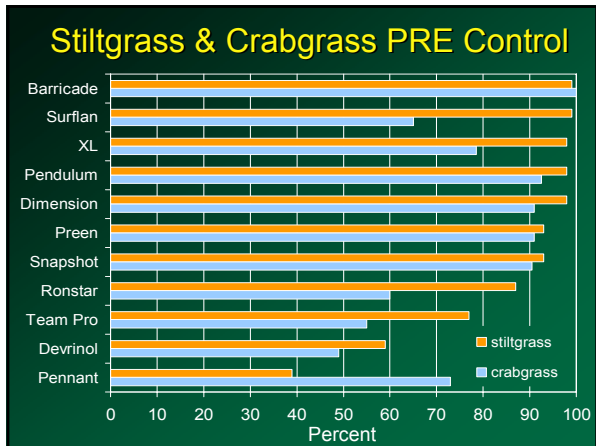
Harvest inflorescences at various times in the reproductive cycle

Germination of immature seed

Collection Date	% Germination
Oct. 7	13c
Oct. 21	57b
Nov. 2	97a
Nov. 14	100a



Stiltgrass PRE Control – 8 WAT



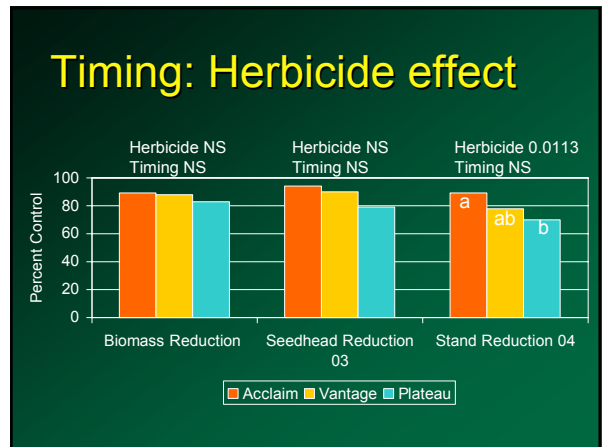


Timing experiment

- Herbicides
 - Acclaim Extra
 - Vantage
 - Plateau
- Timing
 - Early season
 - Mid season
 - Late season

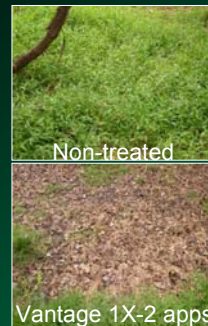
- ### Data collection & analysis
- 2 years (2002 & 2003)
 - 2 locations (NC and VA)
 - RCBD, 4 replications, ANOVA
 - Percent control ('02 and '03)
 - Percent seedhead reduction ('03)
 - Percent stand reduction (May '04)



Timing effect – Oct 2003

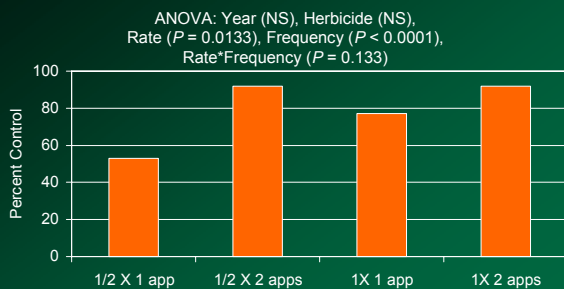


Herbicide, rate, and frequency



- 2 years (NC)
- Herbicides
 - Acclaim Extra
 - Vantage
- Rates - 1/2X, 1X
- # Applications
 - 1 application (mid-season)
 - 2 applications (4 wk interval)

Herbicide, rate, and frequency



Herbicide, rate, and frequency

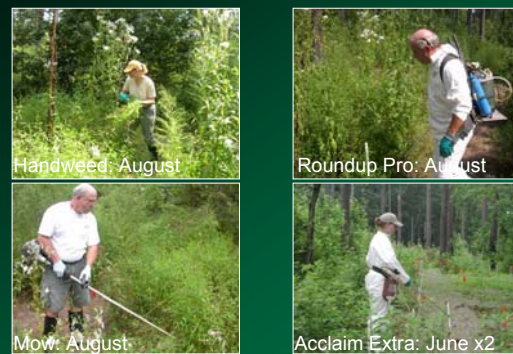
Oct 2003



Summary

- All three selective herbicides were effective at each application timing
- Multiple applications were more effective than single applications (whether 1/2X or 1X)

Conventional vs. selective



Data collection & analysis

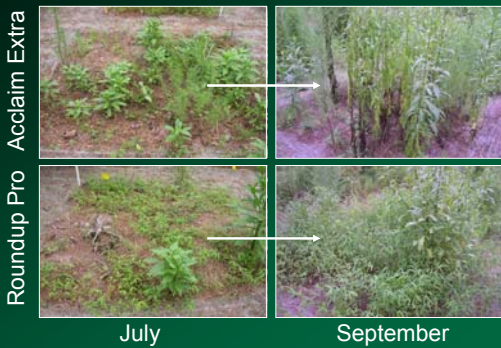
- Percent cover: 2002 to 2004
 - Mid-summer
 - Late-summer
- Soil cores: 2002 to 2004
 - 2 per plot (10 x 5 cm)
 - Identified species
 - # of individuals
- ANOVA ($P \leq 0.05$)



Selective vs. nonselective 2002



Selective vs. nonselective 2003



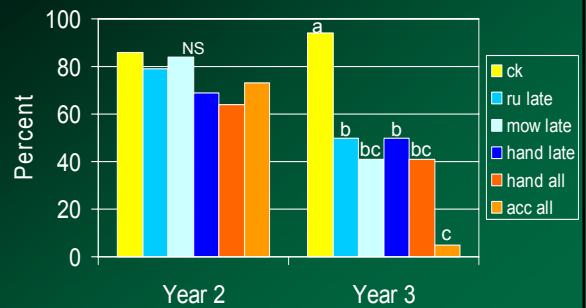
Selective vs. nonselective 2004



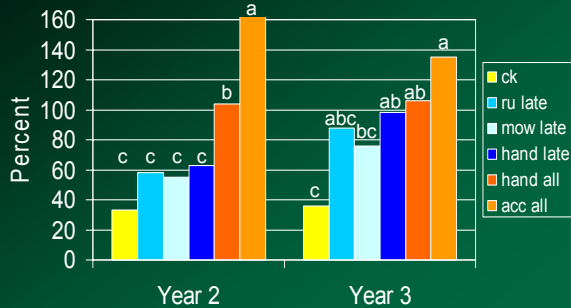
End of 3rd season comparisons



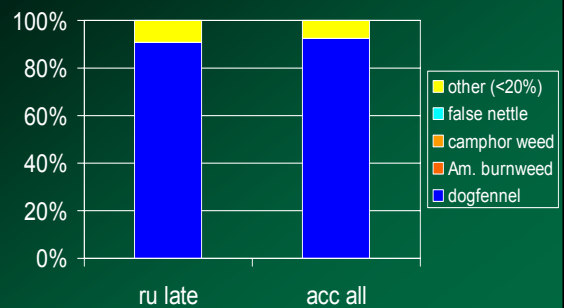
Japanese stiltgrass cover: Duke Forest



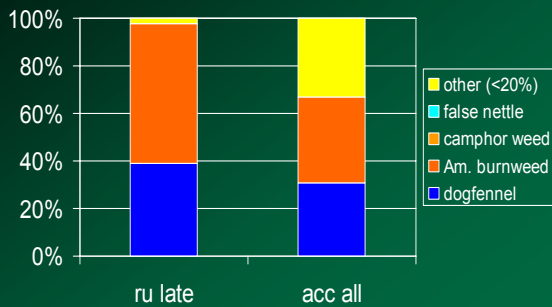
Herbaceous dicot cover: Duke Forest



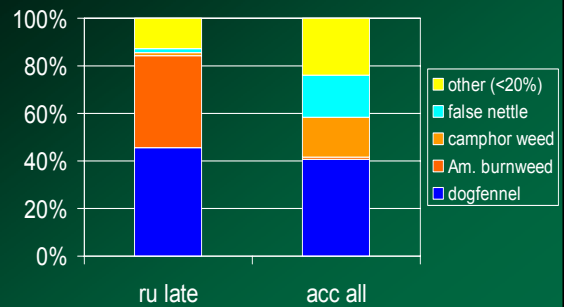
Herbaceous dicot cover: Duke Forest – 2002



Herbaceous dicot cover: Duke Forest – 2003



Herbaceous dicot cover: Duke Forest – 2004



Summary

- Japanese stiltgrass
 - All treatments effective control & seed bank reduction
- Herbaceous dicots
 - Greater diversity in selective treatment

The future?

- What will happen after we control Japanese stiltgrass?
- Will re-established plant communities be less susceptible to invasion?
- Can we truly exhaust the seed bank?



Questions??

