Affects of Herbicide Timing and Application Method on Fruiting and Germinable Seeds in Chinese Privet (*Ligustrum sinense*)

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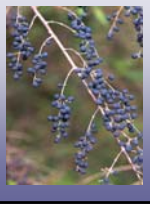


Privet Characteristics

- Semi-evergreen perennial shrub
- 5 to 30 ft in ht
- Flowers April to June
- Seeds green to blue/black in the fall

Chinese Privet

- Introduced 1852
- Planted as ornamental
- Escaped cultivation
- Aggressive invasive species
- Adaptable to many sites
- Shade tolerant
- Prolific seed producer

Distribution

http://plants.usda.gov/

Trouble with Privet

- Limits
  - Regeneration
  - Wildlife habitat
  - Biodiversity
  - Recreational activities
  - Stream quality?

Control

- Best option is Herbicide
  - Mechanical = Site disturbance
  - Fire = Resprouting
  - Biological controls = None
  - Manual = Only on smaller plants

The Problem

- **Previous studies**
  - Late season applications

    Ahuja (2003)

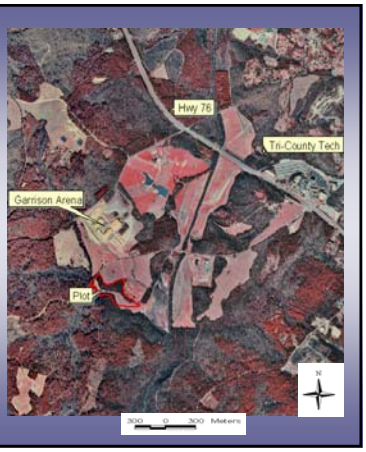
    Harrington and Miller (2005)
- **Fruit and Seed production complete by October**
- **Late season control may be temporary**
  - Seed still viable (1 yr)

Objective

- **Determine:**
  - **Optimum time and method to apply herbicides in order to control the adult plant and eliminate fruit production and/or seed germinability.**

Methods

Location of Study Area



Set Up

- **2 spray types**
  - **Foliar (glyphosate)**
  - **Basal (triclopyr)**
- **4 rates (none, low, medium, high)**
- **8 application times (May to December 2004)**

Foliar Spray

- **128 plants under 6 ft**
- **Spray-to-wet**
- **Accord SP®**
- **Rates - % v/v in water**
  - **2.5 (Low)**
  - **5 (Medium)**
  - **10 (High)**

Basal Spray

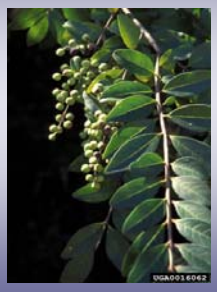
- 128 plants over 1.83 m
- Garlon 4®
- % v/v in vegetable oil
  - 10 (Low)
  - 20 (Medium)
  - 30 (High)
- Lower 18 in of stem

Experimental Design

- Completely randomized
- 4 replications (plants)
- 32 plants treated each time
  - 8 non-sprayed plants (4 basal/4 foliar)
  - 12 foliar sprayed (4 per rate)
  - 12 basal sprayed (4 per rate)

Pre-spray seed count

- Established baseline seed production
- Counted before each spray
- 3 seed branches



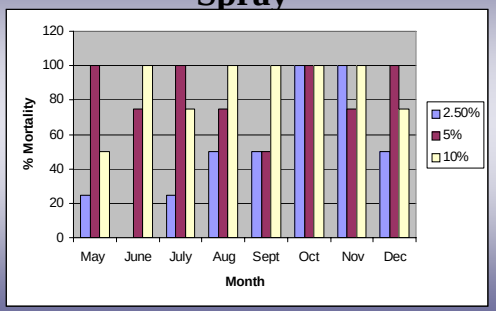
After Spray

- Plants assessed for
  - Mortality
  - Seed development
- Until February 2005

Results and Discussion

Plant Mortality

% Plant Mortality for Foliar Spray



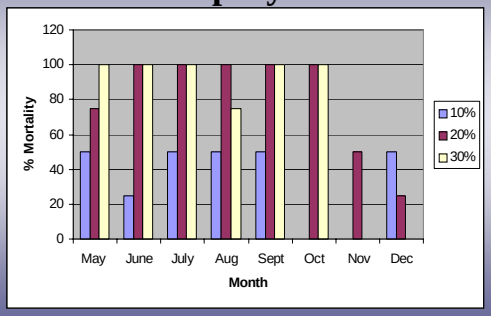
Low (2.5%) Foliar Rate

- Most effective (100%) in October and November
  - Save costs
  - Reduces herbicide in the environment
- Why so efficient?
  - Flowering, shoot growth, and seed production all complete

Medium (5%) and High (10%) Foliar Rates

- 5 % Rate = 100 % Control in May, July, Oct. and Dec.
- 10% Rate = 100 % Control in June, Aug, Sept. Oct. Nov.
- Why are higher rates needed for Spring/Summer?
  - Active shoot growth
  - Drought

% Plant Mortality for Basal Spray



Basal Spray

- 10% too low effective control
- 20% effective May to October
- Lower mortality rates in late season attributed to
  - Lower bark penetration
  - Time between treatment and evaluation

Results and Discussion

Seed Production

Pre-Spray Seed Counts

- T-test for control vs. sprayed seed populations
  - Acceptable comparison for most treatments
  - Difference in mean populations
    - Sprayed plant means higher

Seed Production After Spray

- Virtually eliminated from May to September
- Early herbicide application controls both mature plants and seed production

Seed Problems

- October to December - could not accurately assess seed population control
  - Large amounts of seed loss
    - Bird predation
    - Windstorms
    - Natural seed drop

Conclusions

- Follow-up study
  - Check late season basal plant mortality
- Study suggests early, high rates will most effectively control mature privet and seed

Questions?