A COST EFFECTIVE ANALYSIS OF CONTROLLING INVASIVE AMUR CORKTREE

By: Landon Neumann, Cole Jones, and Nic Seaman

Amur corktree (*Philodendron amurense*)

Photo Credit: Missouri Botanical Garden

MSU Extension

massaudubon.org

AMUR CORKTREE ID

- Grows to 40 feet tall, reaches 50 feet wide
- Distinct blocky and corky bark
  - Gray in mature corktree/golden tan in younger saplings
- Pinnately compound leaves
- Bright yellow cambium layer
  - Most effective identifier

Mature corktree bark

Younger corktree bark/ yellow cambium

WHY ARE THEY SO INVASIVE?

- Corktree regenerates vigorously in high disturbance and is highly shade intolerant.
  - It regenerates well in burns, open fields, etc.
- Produces a large number of seeds that can be dispersed by gravity or by birds.
- Seeds remain viable for more than two years in the soil.
- It tolerates a range of soil conditions, pH, drought, and pollution.
- It is widely planted as an ornamental.

WHERE DID THEY ORIGINATE?

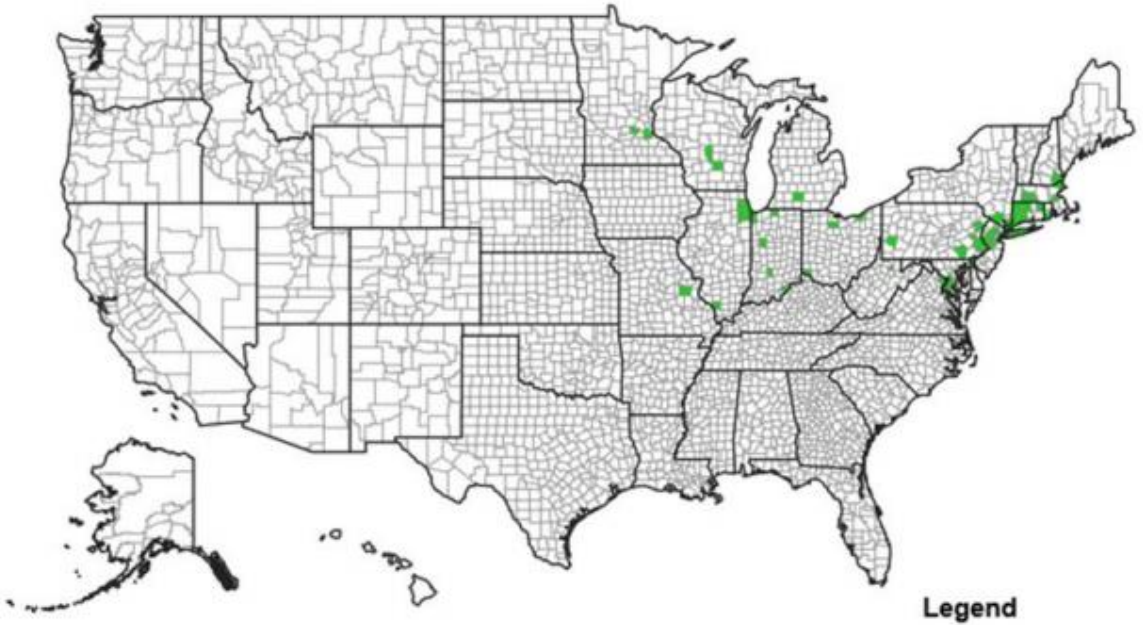
- Native to NE China, Russia, and Hokkaido Japan.
- Brought to Harvard University Arnold Arboretum in 1906.
- Naturalized in New York Botanical gardens by 1933.
- Currently found in Illinois, Indiana,Michigan,Missouri, Wisconsin, New York, Pennsylvania, Virginia, and Massachusetts.
- Well established in New York parks as an ornamental species presently.

Reports made by experts

EDDMapS Distribution:

This map is incomplete and is based only on current site and county level reports made by experts and records obtained from USDA Plants Database. For more information, visit www.eddmaps.org

Amur corktree (*Phellodendron amurense*)



Swearingen, J., C. Bargeron. 2016 Invasive Plant Atlas of the United States. University of Georgia Center for Invasive Species and Ecosystem Health.

OUR OBJECTIVE

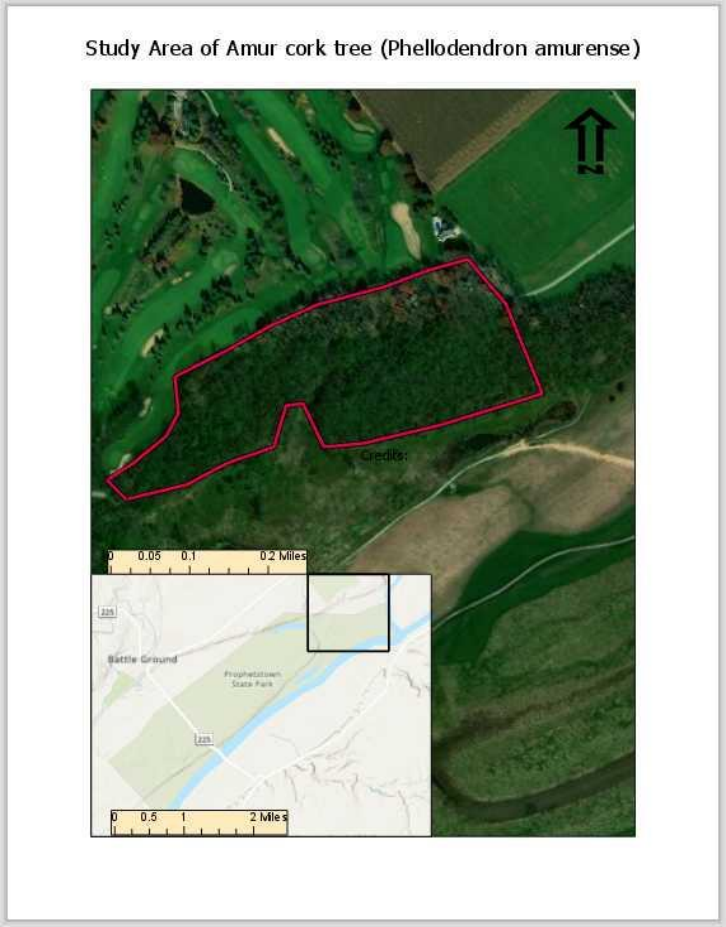
- To determine which of the three methods currently being utilized by the Indiana Department of Natural Resources is the most effective and cost efficient.

OUR HYPOTHESIS

- Hack and squirt will be the most effective treatment.
- Girdling using the machete,or the hack method, will be the cheapest option.

METHODS

STUDY AREA

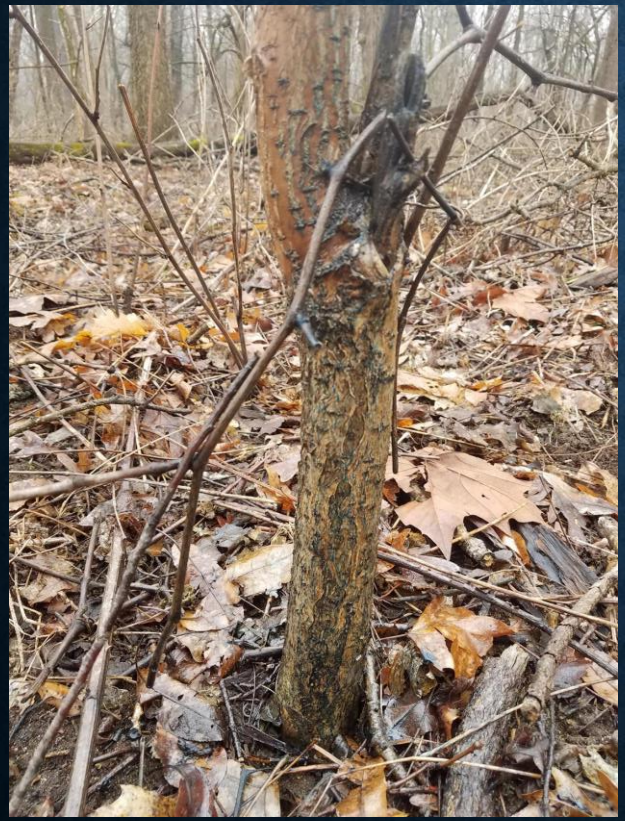

Study Area of Amur cork tree (Phellodendron amurense)
N
Credits:
0 0.05 0.1 0.2 Miles
225
Battle Ground
Prophetstown State Park
225
0 0.5 1 2 Miles

HACK TREATMENT

Equipment Used

- Brush clearing machete

BASAL SPRAY TREATMENT



Equipment Used

- Herbicide resistant spray bottle
- Nitrile Gloves
- Basal Spray (Triclopyr – 20%, Imazapyr – 5%, Super Marking Dye)

HACK AND SQUIRT TREATMENTS

Equipment Used

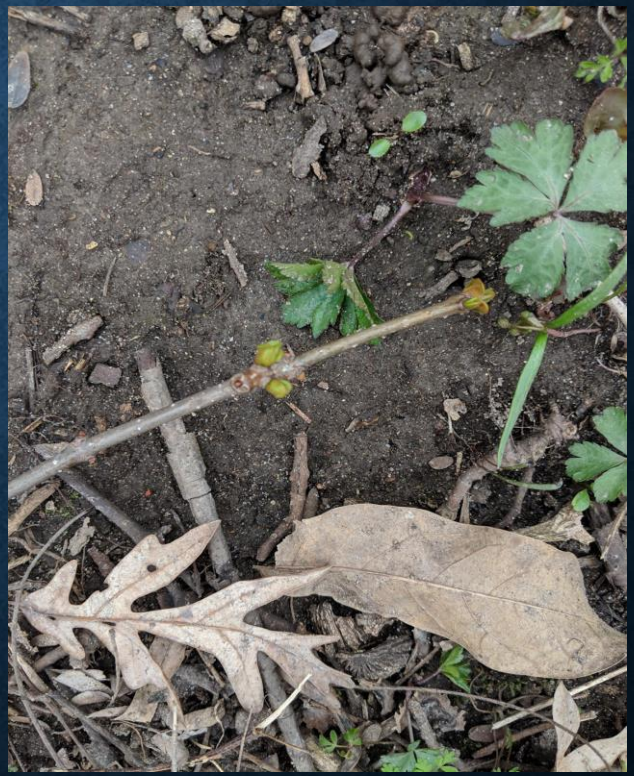
- Herbicide resistant spray bottle
- Nitrile Gloves
- Brush Thinner Machete
- PATHWAY Herbicide

RESULTS

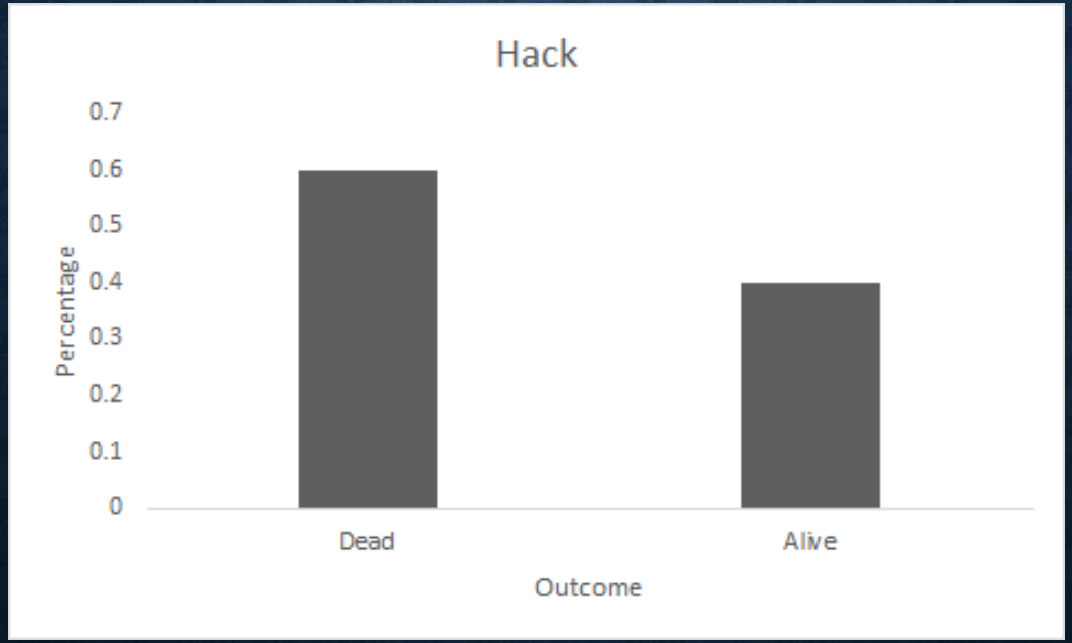
RESULTS – REMOVAL

Removal Method	Number of Trees
Hack	20
Basal Spray	20
Hack and Squirt	20
Total	60

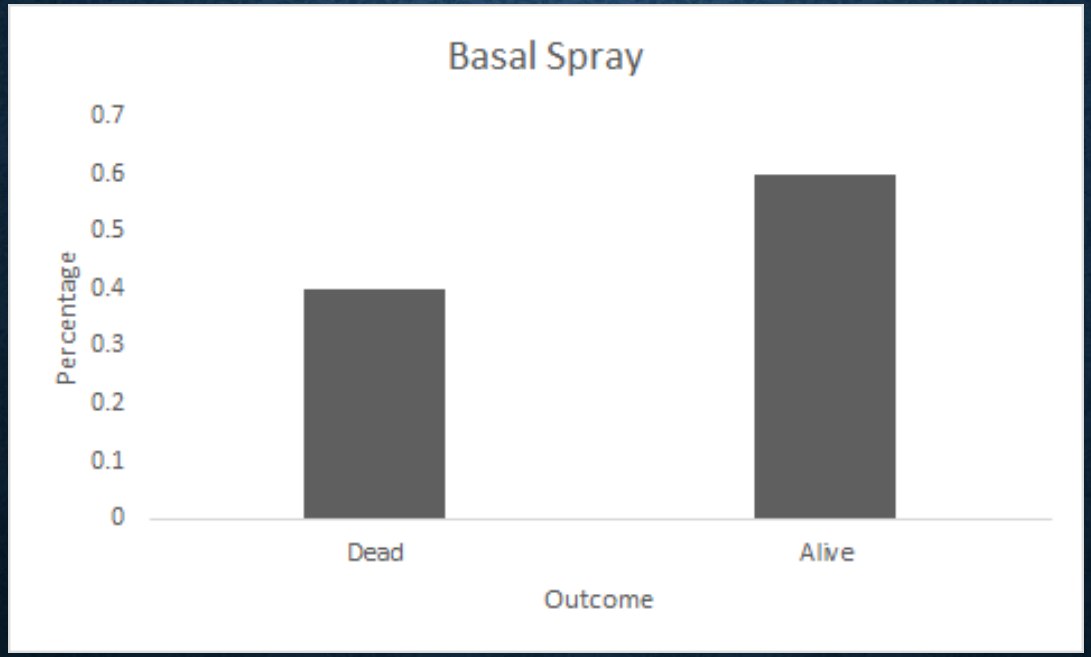
CRITERIA FOR DETERMINING DEAD/ALIVE



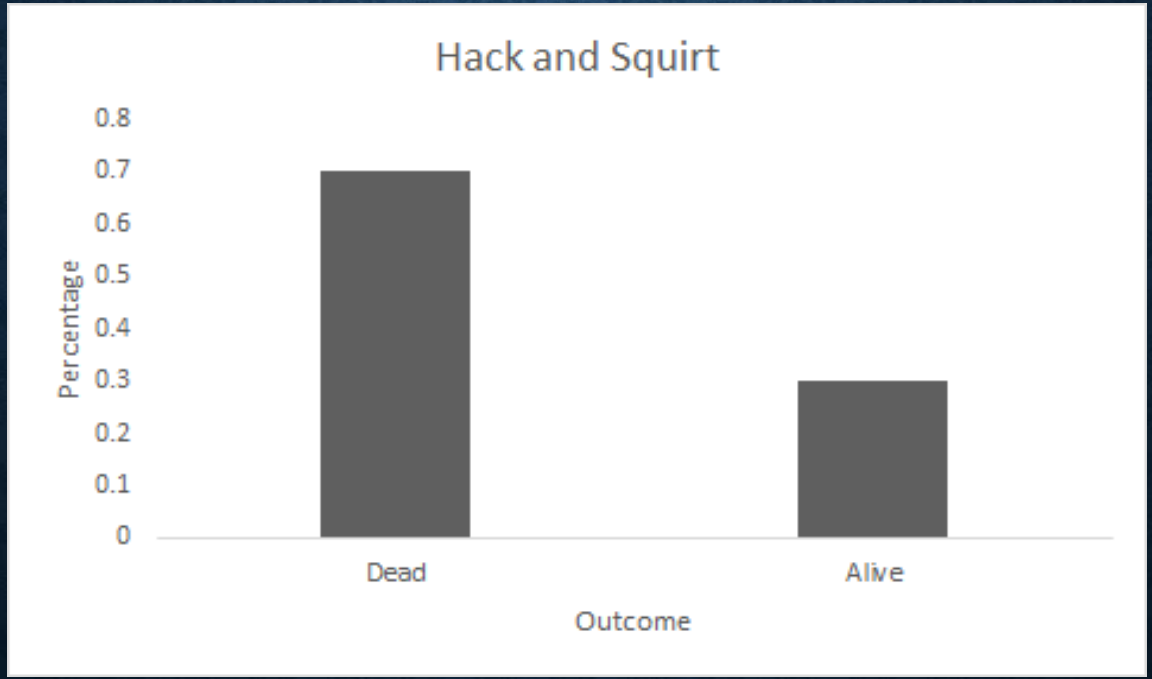
RESULTS - HACK



RESULTS - BASAL SPRAY



RESULTS - HACK AND SQUIRT



RESULTS - COSTS

Fixed Costs		
Equipment	Cost	Total Cost/Acre
Brush thinner	$46	$80.25
machete		
Herbicide resistant	$25.50	
spray bottle x3		
Nitrile Gloves (1000)	$8.75	
Labor		
Labor Hours	$18/acre	$18
Herbicide Costs		
PATHWAY	$50.70/Galloon	$50.70
Basal Spray		$37.23
Triclopyr – 20%	$28	
Imazapyr – 5%	$8.48	
Super Marking Dye	$0.75/oz	

RESULTS - TREATMENT COSTS

Removal Method	Total Cost/Acre
Hack	$64
Basal Spray	$153.48
Hack and Squirt	$166.95

DISCUSSION

- The hack and squirt treatment was the most effective treatment, although the hack treatment was more cost effective and only slightly less successful.
  - Omitting herbicide from the treatment can save the landowner $102.95/acre

- Combat the spread of Amur corktree with sound forest management strategies
  - Reducing disturbances can reduce the spread
  - Monitoring openings and edges for new corktree seedlings

ALTERNATIVE METHODS

- Hand tools are not the most efficient tools for the job
  - Chainsaws may be far more efficient for heavier infestations

- Further research/testing should be done on other invasive control methods
  - Cut stump treatment
  - Foliar application
  - Girdling
  - Prescribed fire

REFERENCES

Blackburn B.C. 1952. Trees and shrubs of eastern North America. New York: Oxford University Press. 358 p.

Glaeser C. W., D. Kincaid. 2012. The non-native invasive Phellodendron Amurense Rupr. In a New York City Woodland. Arboricultural Journal. 28 (3):151-164.

Ning, Z and D. Dafang. 1990. Seed dispersal, dormancy, seedbank, and regeneration of Amur corktree. Journal of Northeast Forestry University 1(1):16-22

Virginia Tech Cooperative Extension. 2009. Invasive plants: a horticultural perspective. Available online at https://vtechworks.lib.vt.edu/bitstream/handle/10919/47480/426-080_pdf.pdf?sequence=1&isAllowed=y;

Simons D (2009) Amur Corktree. In: invasive.org. https://www.invasive.org/alien/fact/pham1.htm.

Swearingen, J. 2009. WeedUS Database of Plants Invading Natural Areas in the United States: Armur Corktree (*Phellodendron amurense*). http://www.invasive.org/weedus/subject.html?sub=11569

QUESTIONS?