Chinese Tallowtree and Cogongrass Control

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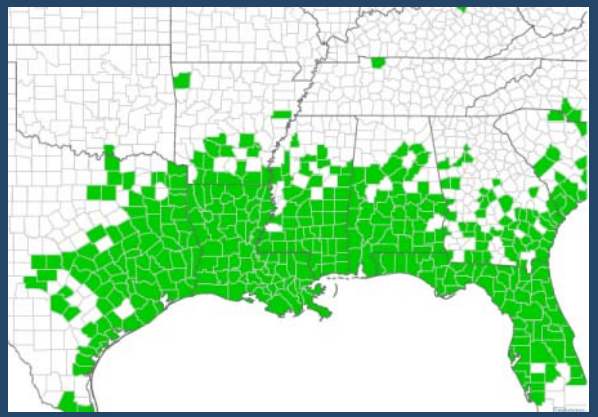
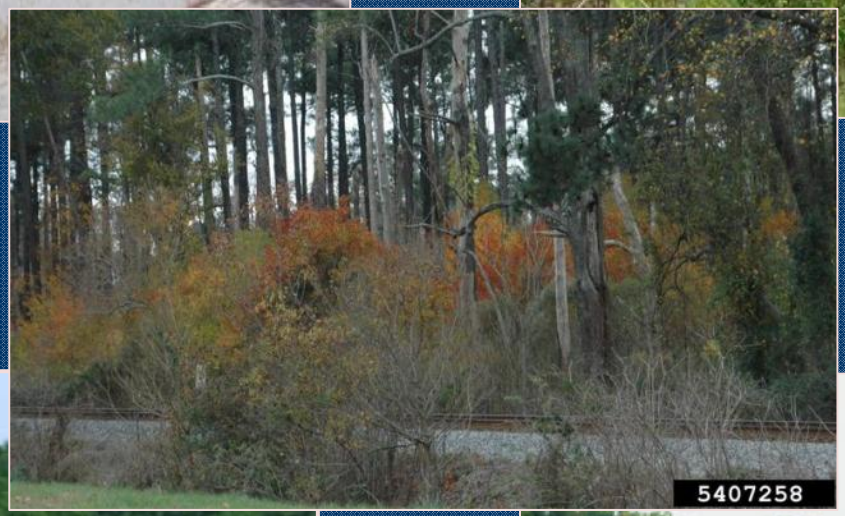
Chinese tallowtree, popcorn tree

(*Triadica sebifera*)

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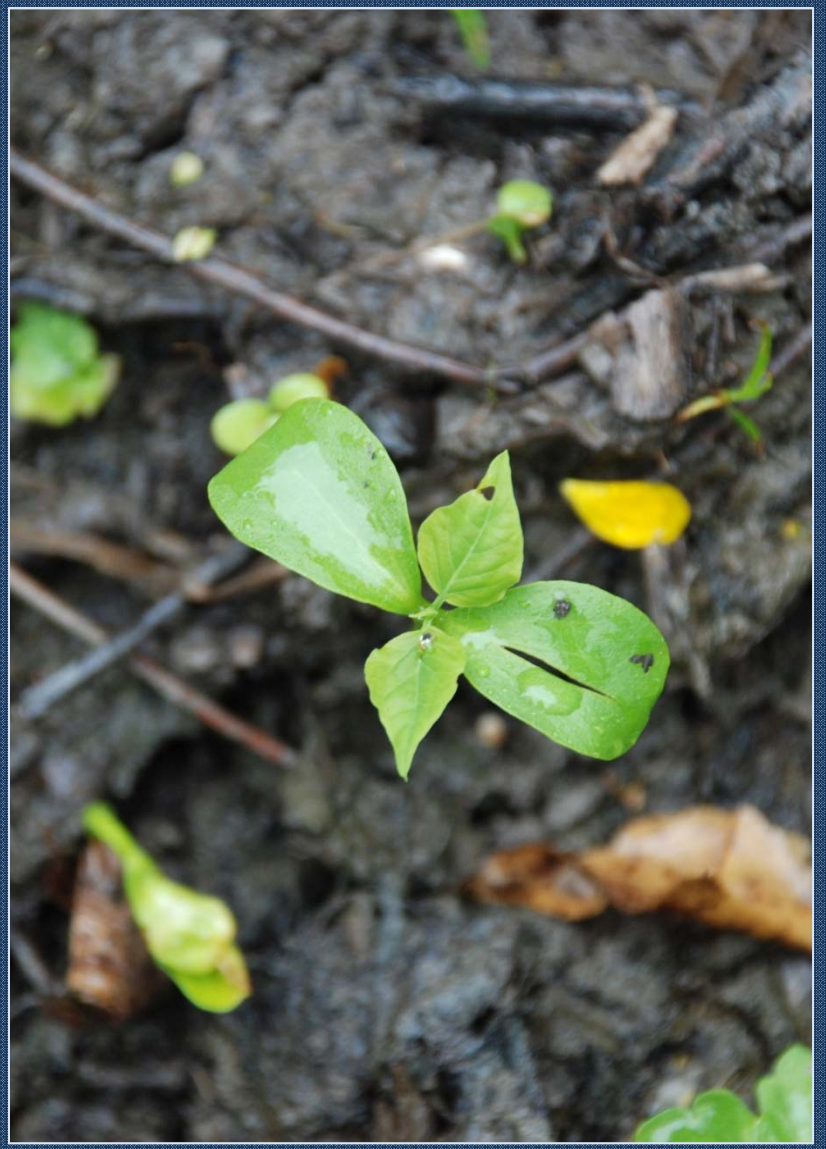
Reproductive Pressure

- Mature trees may produce 100K seeds per year
- Seeds are spread by birds and water
- Seed bank estimates of over 3 million per acre
- Seeds may be viable for at least seven years
- Seedlings emerge from spring through fall




Chinese tallowtree – a prolific sprouter

Control Options

Standard Foliar Herbicide Treatment Options for Tallowtree

- **Triclopyr ester** (Remedy, Garlon 4, Generics)
  - 2% v/v for spot treatment (high volume)
- **Triclopyr amine** (Garlon 3A, Generics)
  - along water
  - 2% v/v for spot treatment (high volume)
- **Imazapyr** (Arsenal or Habitat)
  - 1% v/v (high volume)
- **Imazamox** (Clearcast)
  - 0.5-2%v/v for spot treatment

- Timing for all: after full leaf out through early fall

Standard Basal Bark Treatment Options for Tallowtree

- Triclopyr ester (Garlon 4, Remedy)
  - 20% v/v in oil carrier
  - Pathfinder II (ready to use product)

- Size - ≤6 inches ground line diameter
- Timing – anytime, but late fall is easiest

Standard Cut Stump Treatment Options for Tallowtree

- Triclopyr amine (Garlon 3A, Generics)
  - 10-50% v/v
  - Fall or winter
- Imazapyr (Arsenal)
  - 10% v/v
- Glyphosate
  - variable success with Chinese tallowtree

- For homeowners: OrthoMax Poison Ivy and Tough Brush Killer Concentrate (8.8% triclopyr amine)
  - 100% product

Common problem:

Sprouting following treatment

…from root collar *and* from lateral roots

Lateral roots

S. Enloe

"New" herbicides

- Imazamox - Clearcast
  - Veg control in and around aquatic and non-cropland sites including ROWs, wildlife openings
  - Labeled for Chinese tallowtree (64 – 128 fl ozs/A)
- Aminocyclopyrachlor - Streamline, Prospective, Viewpoint
  - Selective for broadleaf weeds, woody species, vines and grasses (possible damage to pines)
  - ROWs, turf and lawns, wildlife areas
- Fluroxypyr - Vista XRT
  - Broad spectrum control of annual and perennial broadleaf weeds
  - ROW, non-irrigation ditch banks, pine plantations (with care), industrial sites, grazed areas
- Aminopyralid - Milestone
  - broadleaf weeds, kudzu, wisteria, black locust, mimosa, Japanese stiltgrass
  - Rangeland, pastures*, CRP, non-cropland, ROWs, non-irrigation ditch banks, natural areas

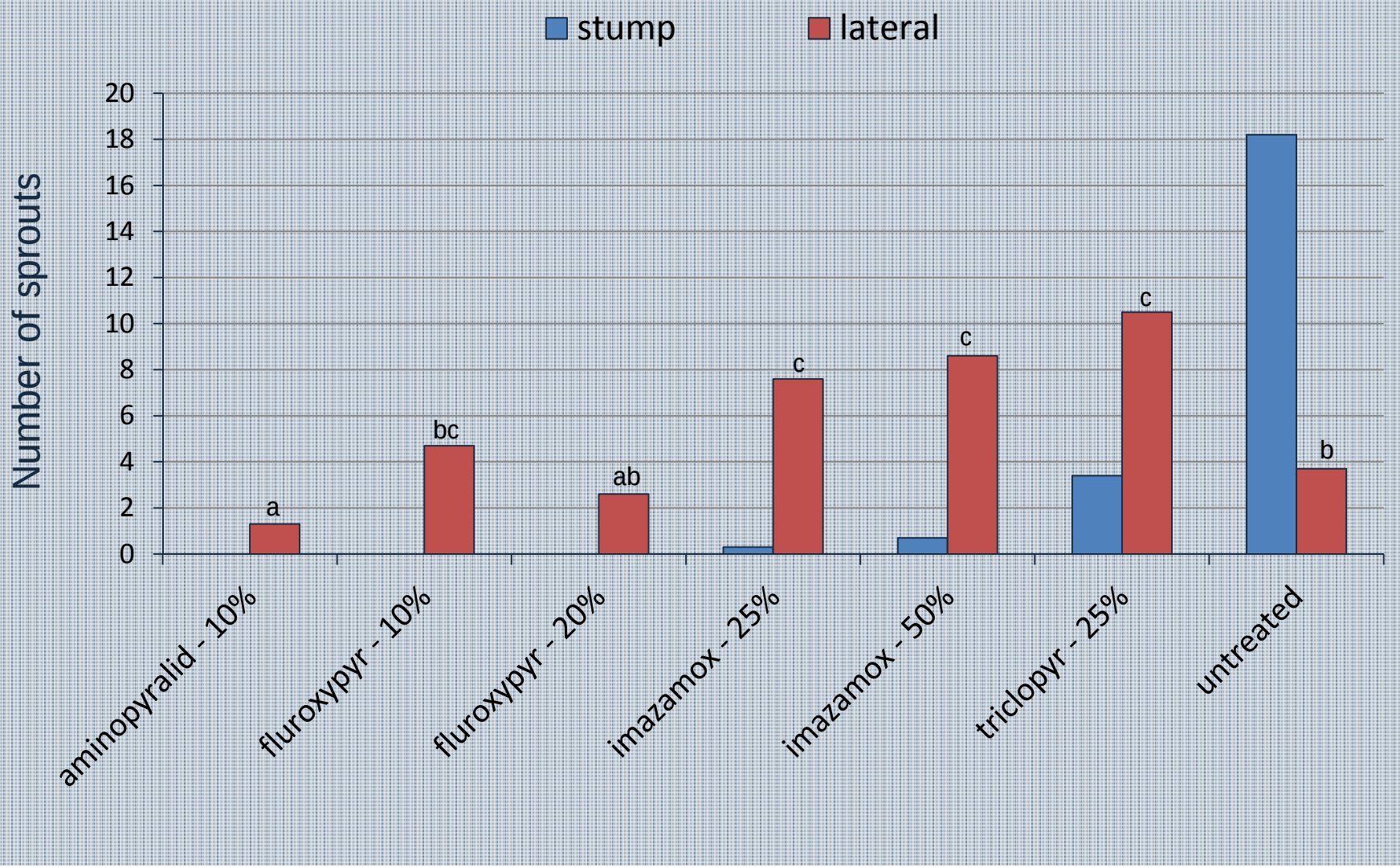
Cut Stump Treatments
Applied December 2011

- Garlon 3A
  - 25% v/v
- Clearcast
  - 25% v/v
  - 50% v/v
- Aminocyclopyrachlor (MAT)
  - 20% v/v
- Milestone
  - 10% v/v
- Vista XRT
  - 10% v/v
  - 25% v/v
- Untreated

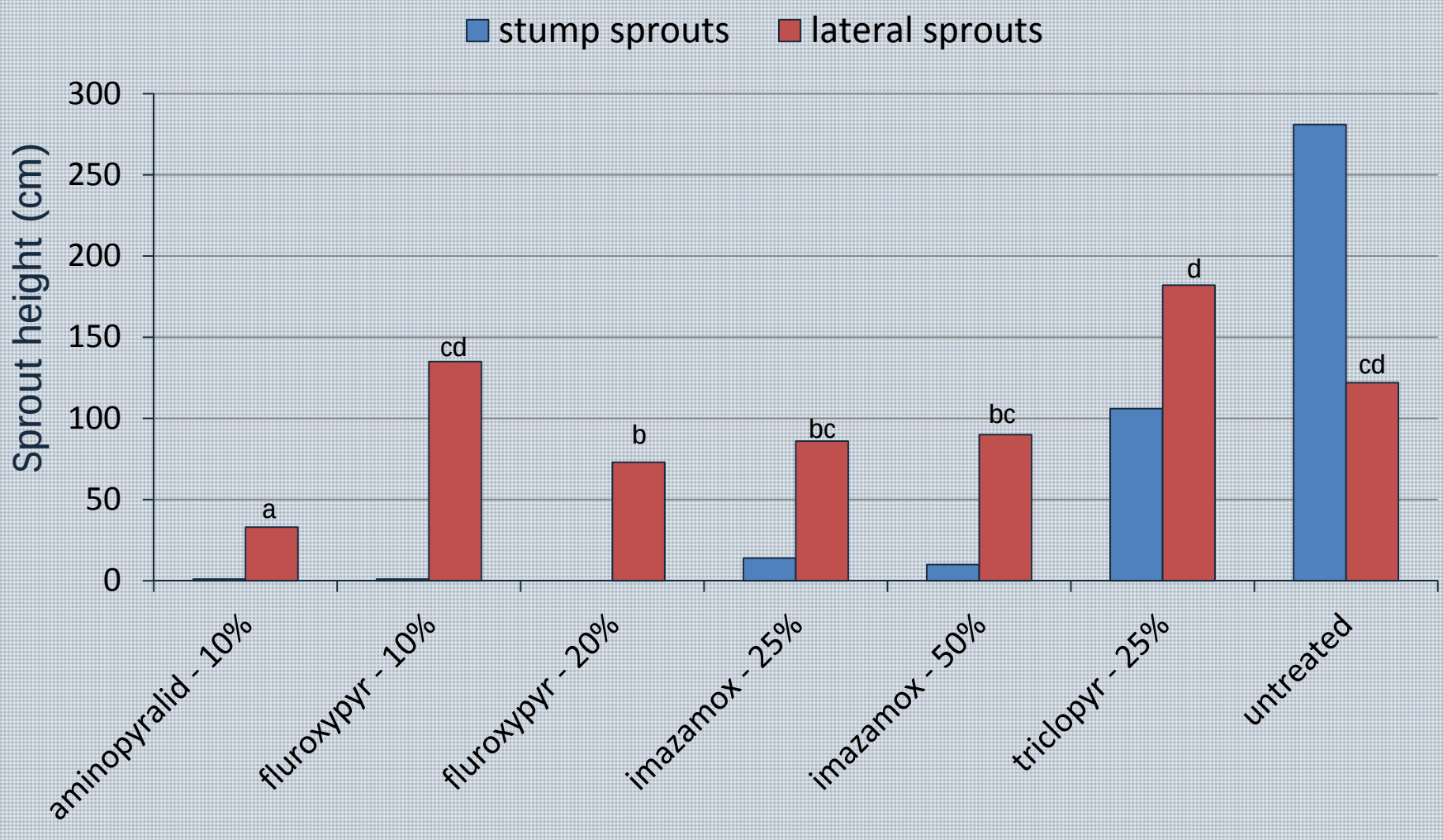
Untreated cut stumps

avg ht=11.8 ft

Chinese tallowtree response to cut stump treatment at 21 months – number of sprouts



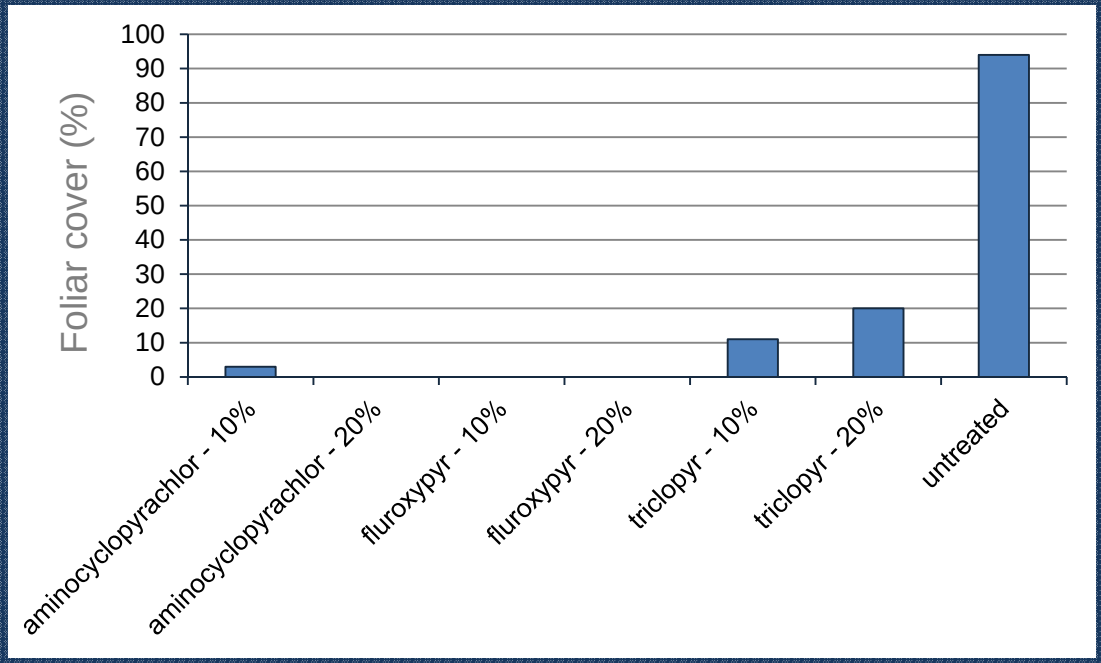
Chinese tallowtree response to cut stump treatment at 21 months –avg sprout height



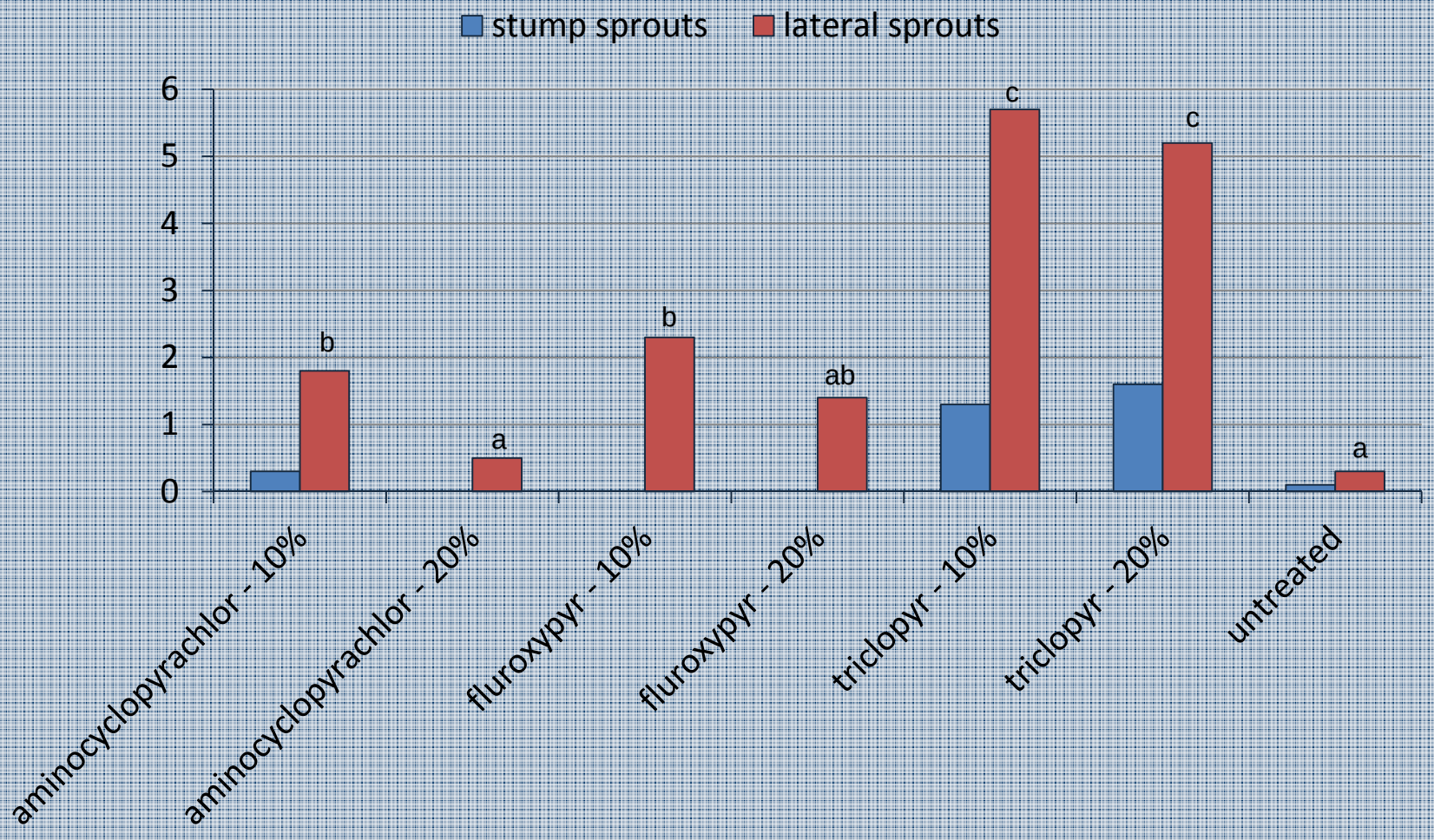
Basal bark treatments
Applied December 2011

- Garlon 4
  - 10% v/v
  - 20% v/v
- Vista XRT
  - 10% v/v
  - 20% v/v
- Aminocyclopyrachlor (MAT)
  - 1 lb ae/gal oil soluble formulation
  - 10% v/v
  - 20% v/v
- Untreated

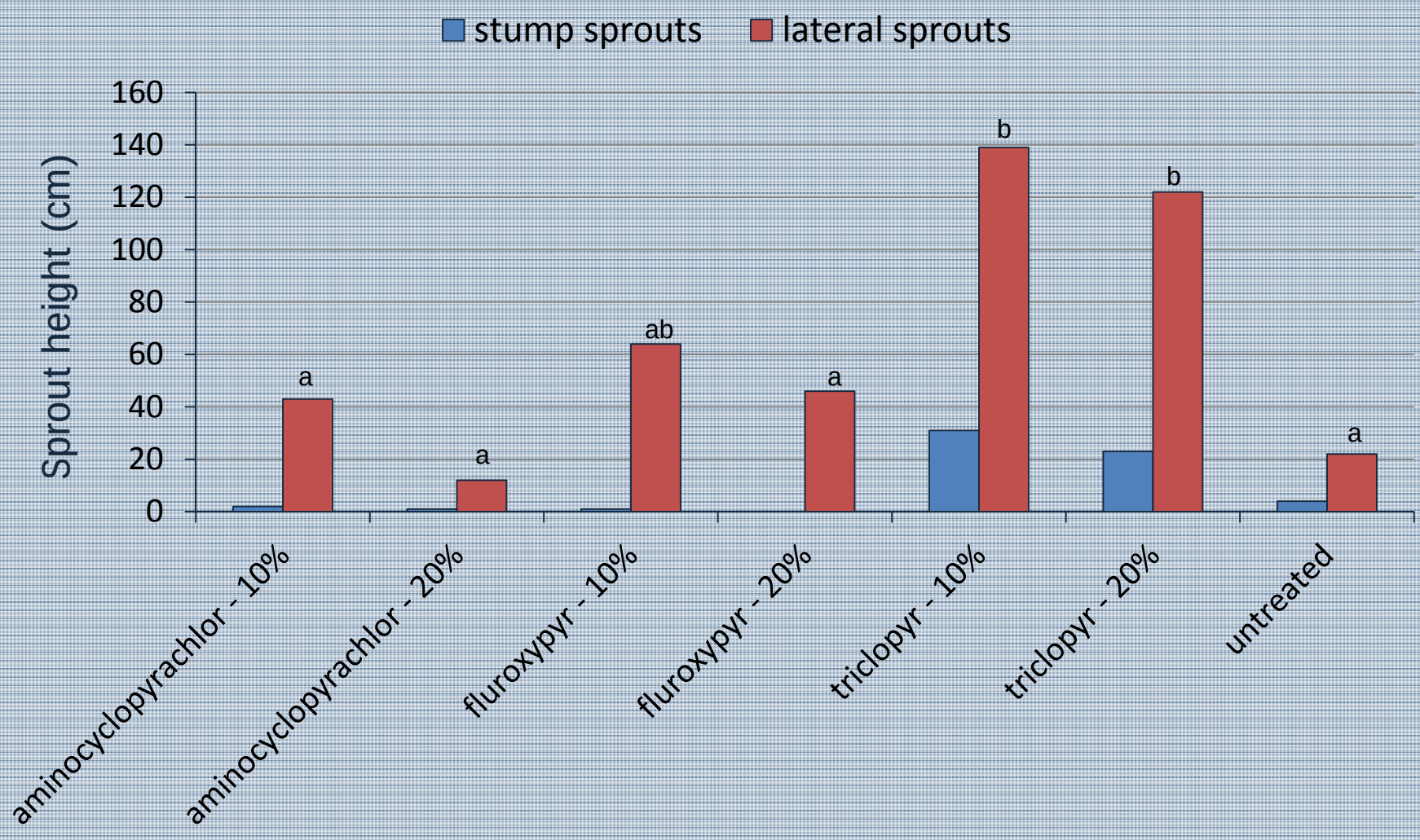
Chinese tallowtree response to basal bark treatment at 21 months - foliar cover

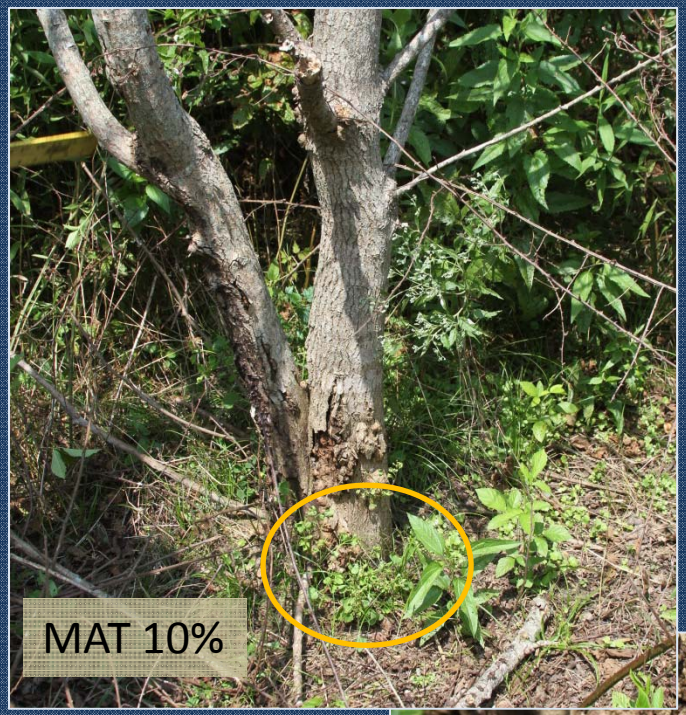


Chinese tallowtree response to basal bark treatment at 21 months- number of sprouts



Chinese tallowtree response to basal bark treatment at 21 months- sprout height





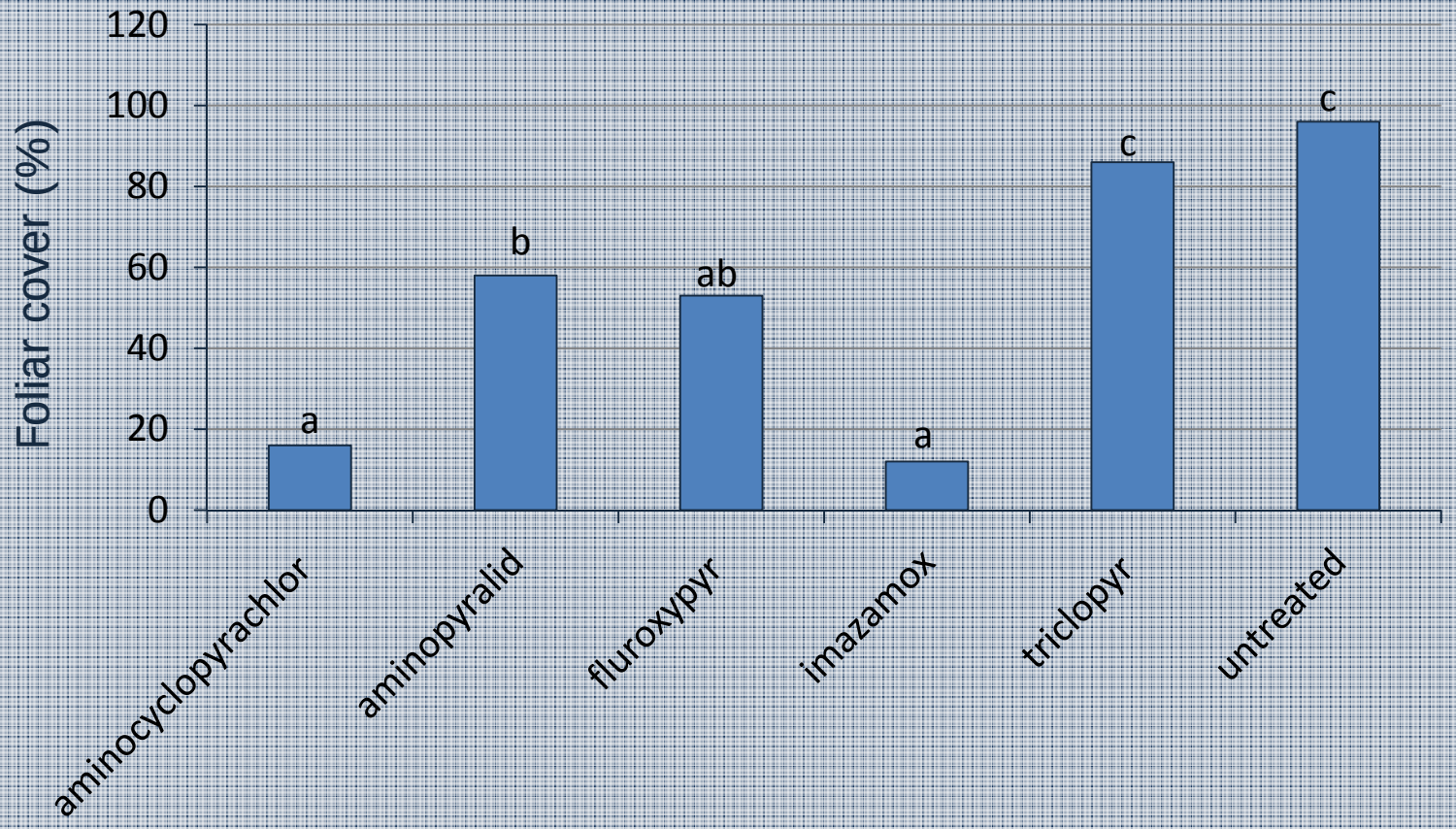
Sprouting following basal bark treament

Foliar treatments

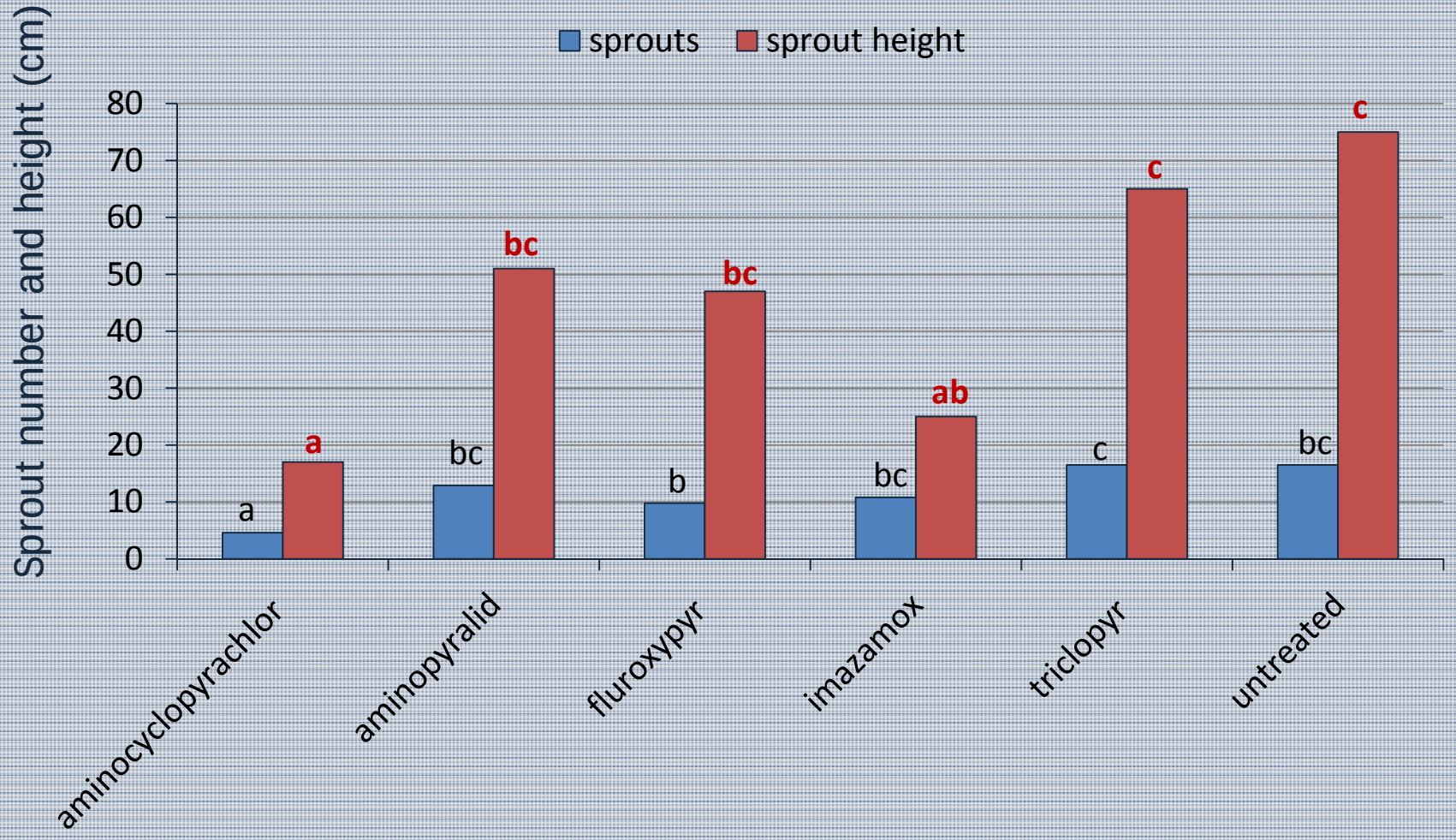
Applied June 2012 … after about 4.5 ft of regrowth (cut Jan 2011)

- Garlon 3A
  - 2% v/v
- Clearcast
  - 2% v/v
- Milestone
  - 0.25% v/v
- Vista XRT
  - 0.44% v/v
- MAT
  - 1.5 g/L
- Untreated

Chinese tallowtree response to foliar treatment at 15 months- foliar cover



Tallowtree response to foliar treatment at 15 months- number and height of sprouts



Note: most sprouts originated at root collar

Promising new herbicides for tallowtree control

- Milestone for cut stump
- MAT and Vista XRT for basal bark
- MAT and Clearcast for foliar

ANR-2232

Management Options for Chinese Tallowtree

Chinese tallowtree has slender yellow flowers that bloom during the early summer. The distinctive diamond-shaped leaves turn red in the fall.

Chinese tallowtree, *Triadica sebifera* (L.) Small, is one of the most invasive trees in the southeastern United States. It is a classic example of a plant introduced into the United States with good intentions but with very bad outcomes.

Benjamin Franklin is often cited as having introduced the tallowtree into the United States in 1772, but the species has been repeatedly promoted over the past 100 years for numerous purposes, including in the soap industry, as an ornamental shade tree, for honey production, and, most recently, for bioenergy. Chinese tallowtree is an ecosystem transformer with tremendous negative impacts in wetlands, pastures, prairies, and forests. In almost all of these areas, tallowtree invasion frequently results in a closed canopy tallowtree forest with few other species present.

Multiple factors can make tallowtree management difficult. It produces large numbers of fruits, which are spread by water and are consumed and spread by many species of birds. Bottomlands subject to periodic flooding may be repeatedly reinfested from upstream seed sources. Tallowtree is also an aggressive sprouter and rapidly regenerates from both stumps and lateral roots, so mechanical control methods frequently exacerbate the problem.

Multiple factors can make tallowtree management difficult.

This publication provides recommendations for several control techniques that can be used for tallowtree across a range of environments. Some discussion of techniques that do not work is also provided. Not all techniques can be used in all situations, and tallowtree frequently grows along water in places that are difficult to access.

Physical Removal

Seedlings may be pulled when they are very small, but hand pulling is not generally an effective option for controlling established tallowtree. Tallowtree rapidly establishes a deep taproot, making saplings difficult to


cogongrass research and control

Cogongrass Control with Herbicides

- **Glyphosate** (Accord, Roundup, Glypro, …)
  - 3-4 lb ai/A broadcast
  - 2-5% v/v spot
- **Imazapyr** (Arsenal, Arsenal AC, Chopper Gen 2, …)
  - 0.5-1 lb ai/A broadcast
  - 0.5-2% v/v spot
- **Glyphosate + Imazapyr**

Summary of herbicide control

- One application per year of glyphosate can control cogongrass, but it will take longer
- Two applications per year of glyphosate is more effective
- Imazapyr is consistently more effective than glyphosate
- Combining glyphosate with imazapyr did not provide better control than either used alone
- Aminocyclopyrachlor with imazapyr may help with seed suppression on ROW
- Cogongrass can be eradicated on individual sites, but some sites are easier to control than others

ANR-2230

Cogongrass Management FAQ

Cogongrass (*Imperata cylindrica*) is one of the greatest invasive plant threats in Alabama and in the southeastern United States. Although it has been here for more than a century, the problem has dramatically increased in the last 20 years. Many land managers actively and aggressively manage cogongrass and Auburn University researchers have been working on solutions for cogongrass for many years. This publication provides a summary of many years of research and is in the form of answers to the most common questions regarding cogongrass management.

Q: Can I hand pull cogongrass?

Cogongrass has sharp leaf edges and razor-sharp sprouts at ground level making hand pulling quite hazardous. Furthermore, it is extremely difficult to pull cogongrass without leaving behind rhizomes (underground stems), making this approach largely ineffective, even for very small patches.

Q: Will tillage alone control cogongrass?

In areas that can be accessed with machinery, repeated tillage that breaks up the entire rhizome layer will eventually exhaust the energy reserves of cogongrass rhizomes. Tillage fragments the rhizome network, resulting in an increase in new shoot emergence. When repeated after new shoot emergence, tillage will further disrupt growth and decrease stored energy reserves. This approach of repeated tillage can work well over time. If tillage is not repeated, the cogongrass patch may end up thicker than it was to start with. Likewise, shallow, infrequent tillage will generally not control cogongrass. Care must also be taken to clean tillage equipment to avoid spreading rhizomes.

Q: Will prescribed fire control cogongrass?

NO. Prescribed fire at any timing promotes cogongrass to the detriment of almost all other species. Cogongrass can burn hot enough to kill fire tolerant species, even young loblolly and longleaf pine. Burning dense patches of cogongrass when trees are at risk is not recommended. Cogongrass can also be spread by fire-plows that can drag rhizome pieces to uninfested areas.

Fig. 1. Cogongrass fires burn extremely hot.

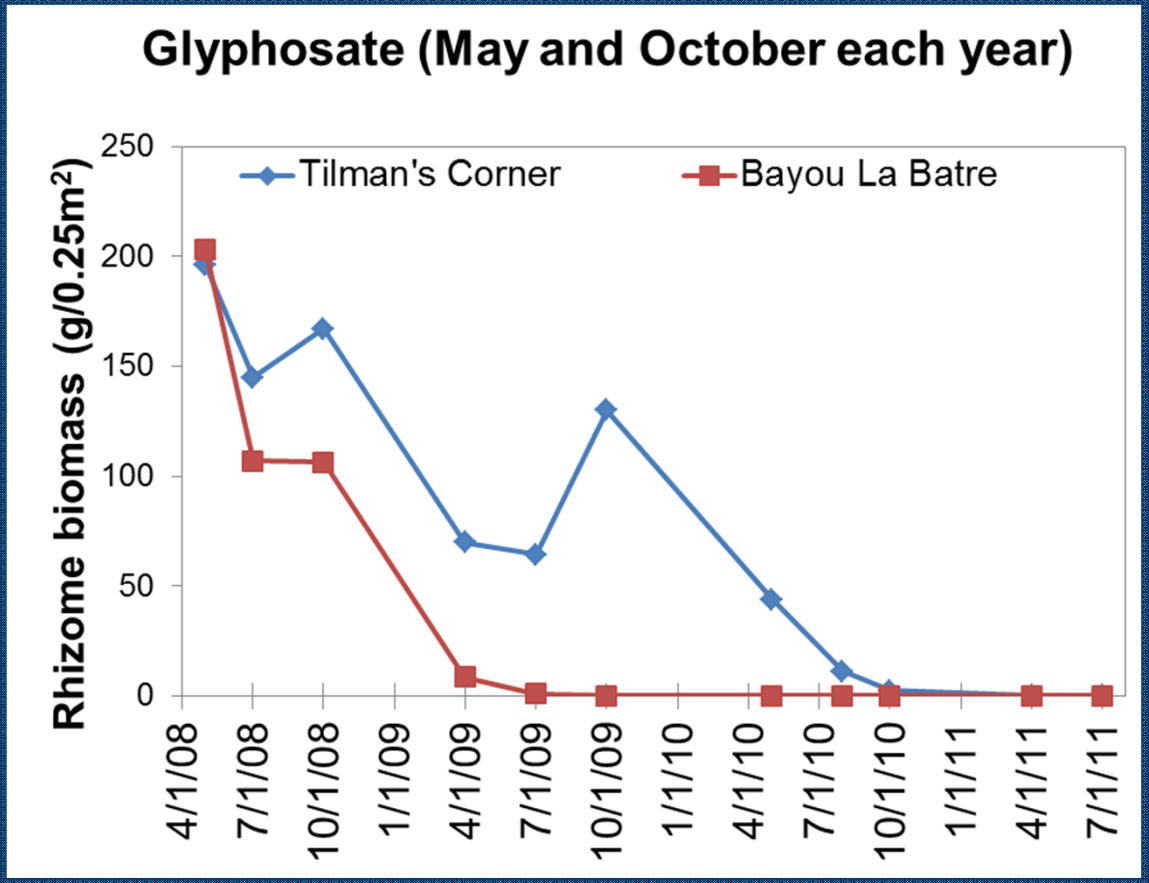
Q: Will grazing control cogongrass?

Cogongrass was tested as a potential forage crop in Mississippi and Florida more than 80 years ago and was found to be virtually useless. Cattle will graze very young cogongrass shoots, but they tend to avoid it as it matures. Cogongrass is high in silica and low in forage quality. Some cattle producers have used mowing to stimulate new growth for cattle grazing, but this is not an effective control strategy.

New cogongrass research

Phenotypic diversity among invasive cogongrass populations and differential responses to glyphosate

Previous research and numerous anecdotal reports indicate variation in response to herbicides between some populations of cogongrass.



Example of phynotypic differences in cogongrass

Primary objective: Determine response to glyphosate treatments

- Cogongrass populations from across the Southeast
- Grown in greenhouse (common garden)
- Dose-response testing with glyphosate
- Evaluate results in light of population genetics and phenotype
- Cooperative agreement with the Forest Service (Dr. Rima Lucardi)

Acknowledgements

- Funding provided by USDA Forest Service Cooperative Agreements
- Cogongrass study - Jatinder Aulakh's PhD study
- Excellent field assistance: Joe Borden, Jatinder Aulakh and Will Dixon


Questions?

Herbicide Costs

Herbicide	Active ingredient	Cost / gallon	Rate	Cost in one gallon of solution
Garlon 4 Ultra	triclopyr ester	$95	20% v/v	$19
Element 4	triclopyr ester	$62	20% v/v	$12
Garlon 3A	triclopyr amine	$85	25% v/v	$21
Element 3A	triclopyr amine	$59	25% v/v	$15
Vista XRT	fluroxypyr	$213	10% 20% 0.44%	$21 $43 $1
Milestone	aminopyralid	$357	10% 0.25%	$36 $1
Clearcast	imazamox	$235	25% 50% 2%	$59 $118 $5