REFORESTATION TECHNIQUES IN COGONGRASS (*Imperata cylindrica*) INFESTED AREAS

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Cogongrass

- ✓ *Imperata cylindrica* (L.) Beauv
- ✓ Synonyms:
  - Japgrass
  - Imperata grass
- ✓ State and federal noxious weed

Identification

- ✓ **Aggressive, perennial grass**
- ✓ **Produces scaly rhizomes**
- ✓ **Leaf blade serrated, with prominent white midrid that is distinctly off-center**
- ✓ **Blades 0.4 –3.9 ft tall, rarely to 9.8 ft (in tropical regions)**
- ✓ **Propagation:**
  - ✓ **seed**
  - ✓ **rhizomes**

The Cogongrass Threat
1974-2004

Severe infestations Light-moderate infestations

Cogongrass in Georgia
April 2004

The Cogongrass Threat!

- ✓ Impacts biological diversity of our forests
  - – Native plants
  - – Wildlife
  - – Endangered species
- ✓ Wildfire!
  - – Cogongrass burns readily

The Cogongrass Threat

- ✓ Forest Products
  - – Increases mortality
  - – Decreases wood production
  - – Effects secondary income sources (*i.e.* hunting leases)

Research Objectives

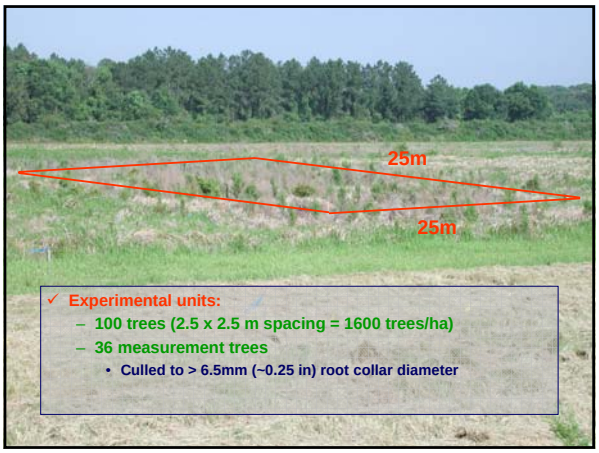
- ✓ A field study was designed to investigate establishment alternatives for loblolly pine (*Pinus teada* L.) into cogongrass infested areas
  - – Mechanical site prep
  - – Chemical site prep
  - – Pine release
- ✓ We want to quantify:
  - – Pine tree response (growth, survivability, wood production)
  - – Cogongrass control

Materials & Methods

- ✓ Location
  - – Degussa.
  - – 800 acre site surrounding a chemical manufacturing facility
    - Theodore, AL (Mobile, Co.)
- ✓ Site history
  - – Row crop agriculture (ceased in late 1980's)
  - – Fallowed until spring 2001
  - – Overstory removed by hand (brush saws, chain saws)
    - Privet (*Ligustrum sinense* and *L. japonicum*)
    - Waxmyrtle (*Myrica cerifera*)
    - Yaupon (*Ilex vomitoria*)
    - Tallowtree (*Triadica sebifera*)
    - Longleaf pine (*Pinus palustrus*)
  - – Stumps treated with 3% triclopyr in diesel to prevent regrowth
  - – Solid stand of cogongrass remained

Materials & Methods (cont'd)

- ✓ Soil
  - – Bama fine sandy loam
  - – pH 5.6
- ✓ Site index
  - – 90 loblolly pine



Materials & Methods

- ✓ Factorial treatm
  - – Mechanic
    - • "Sca
    - • Re
  - – Chem
    - • gl
    - • ima
    - • surfa
  - – Pine release
    - • Imazapyr (4, 6 oz pr/A)
    - • Sulfometuron (2 oz pr/A)
    - • Metsulfuron Escort ag ai/ha (1.0 oz pr/A)
- ✓ Also included a "complete control" treatment
  - – Double rate of SP herbicides, release with Arsenal, Escort, Oust tankmix
- ✓ 9 total treatments, 4 replications

Materials & Methods (cont'd)

Timeline of Events

- October 2001 — Chemical SP
- January 2002 — Trees planted
- Spring 2001 — Site cleared
- December 2001 — Mechanical SP
- October 2002 — Release treatments

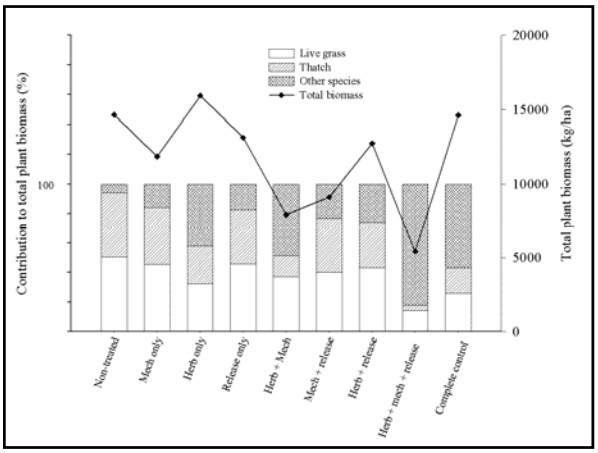
Materials & Methods (cont'd)

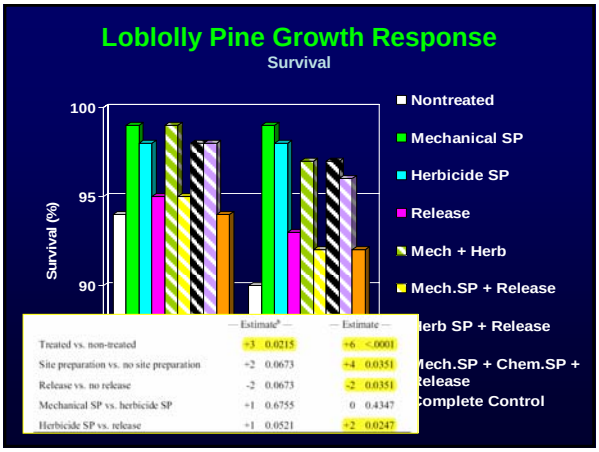
- ✓ Response variables
  - – Ground line diameters (GLD)
  - – Height (HT)
  - – Diameter breast height (DBH)
  - – Biomass
    - • Live cogongrass
    - • Dead cogongrass = 'thatch'
    - • Other species

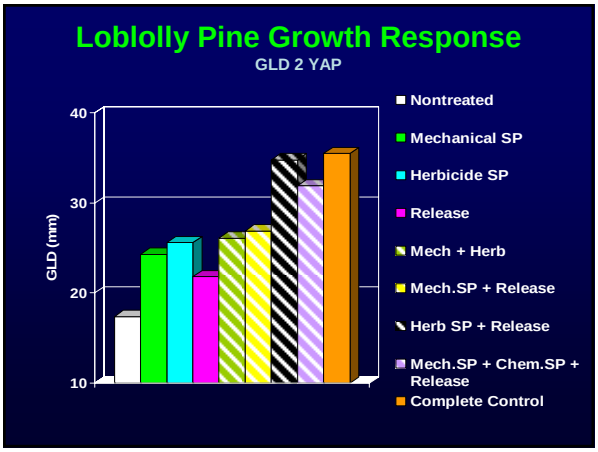
Table 4.7. ANOVA results with main effect and interaction values for woody and herbaceous plant biomass.

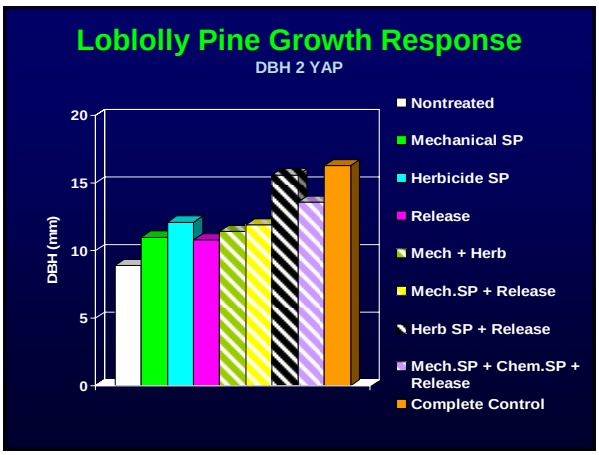
	Live grass		Thatch		Other species	
Effect	Value	$P > F$ [a]	Value	$P > F$	Value	$P > F$
Year 1 (2002)[b]	– kg/ha–		– kg/ha–		– kg/ha–	
Mechanical SP[c]	-1150	<.0001	-1420	<.0001	-260	0.3176
Herbicide SP	-670	<.0001	+300	0.2237	+1380	<.0001
Mechanical x herbicide	-930	0.0006	-950	0.2220	+410	0.0599
Year 2 (2003)						
Mechanical SP	-2820	<.0001	-2500	<.0001	-200	0.8086
Herbicide SP	-2020	0.0010	-2480	0.0001	+2810	0.1435
Mechanical x herbicide	-3650	0.2449	-3880	0.1192	+1300	0.4957
Release	-1250	0.0285	-950	0.0826	-300	0.7212
Mechanical SP x release	-3190	0.1960	-2390	0.7922	+140	0.4709
Herbicide SP x release	-1970	0.5570	-1990	0.4025	+920	0.3306
Mechanical x herbicide x release	-4370	0.3294	-3860	0.5758	+1440	0.2951

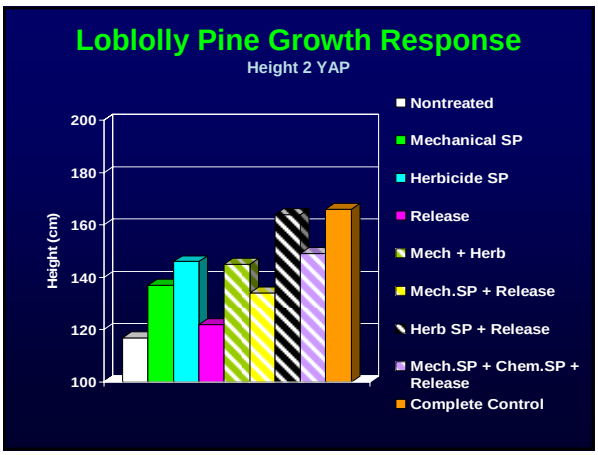
[a]Main effects considered significant for Type I error if $P \leq 0.05$. Interactions considered significant for Type I error if $P \leq 0.10$
[b]All release treatments not applied at time of biomass harvest, therefore, comparisons may only be made between mechanical and chemical site preparation effects and interactions.
[c]Abbreviations: SP, site preparation.









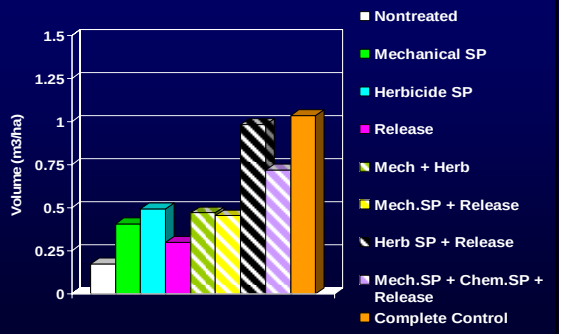


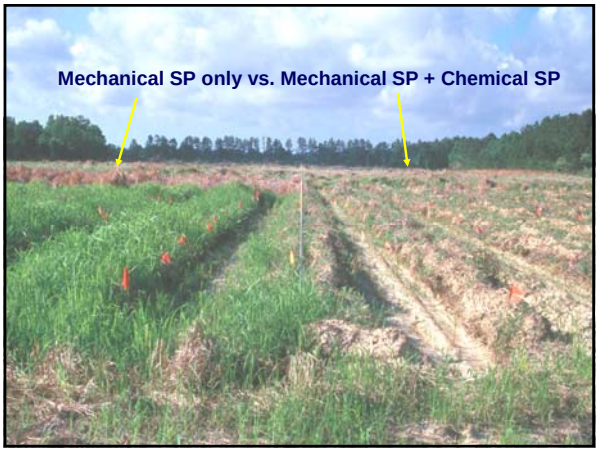
Loblolly Pine Growth Response

	GLD		HT		DBH	
	Estimate[b]		Estimate		Estimate	
Treated vs. non-treated	+11.0	0.0201	+28.3	0.0127	+3.9	0.0472
Site preparation vs. no site preparation	+9.7	0.0126	+29.3	0.0302	+3.3	0.0179
Release vs. no release	+4.9	0.0006	+10.8	0.1884	+2.8	0.0124
Mechanical SP vs. herbicide SP	-3.5	0.0562	-12.6	0.0064	-1.3	0.0934
Herbicide SP vs. release	+0.6	0.4210	+7.0	0.0189	+0.2	0.7160

Loblolly Pine Growth Response

Volume 2 YAP





Results & Discussion

- ✓ Biomass
  - – Cogongrass > 15% despite our efforts
  - – Herbicide SP increased species diversity
- ✓ Pine survivability
  - – 90% or greater
  - – SP = 4% increase
- ✓ Pine growth response
  - – Herb SP most influencing tree growth
  - – Release not effective as a stand-alone treatment