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Seed cleaning and germination testing for the restoration of ground layer plants in a Longleaf Pine ecosystem

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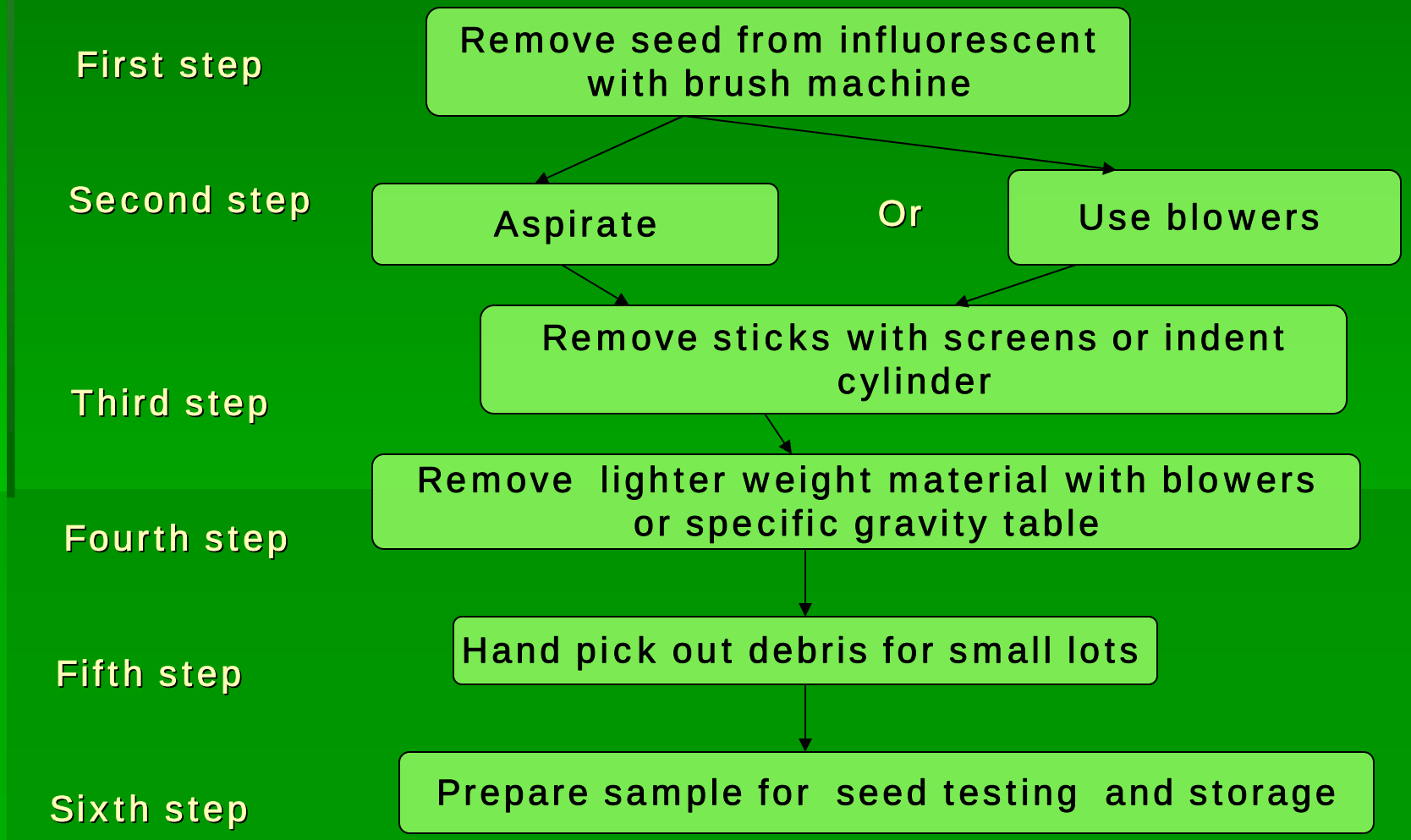
Ground Layer Plants Project

- 39 species of ground layer plants
- Alabama, Georgia, South Carolina
- Seed collection
- Seed cleaning
- Laboratory and nursery germination
- Nursery propagation
- Outplanting

26 Genera of ground layer plants

- *Amsonia*
- *Aristida*
- *Aster*
- *Baptisia*
- *Chamaecrista*
- *Chrysopsis*
- *Coreopsis*
- *Desmodium*
- *Eupatorium*
- *Galactia*
- *Lespedeza*
- *Liatris*
- *Manfreda*
- *Mimosa*
- *Paspalum*
- *Pityopsis*
- *Polygonella*
- *Saccharum*
- *Schizachyrium*
- *Silphium*
- *Solidago*
- *Sorghastrum*
- *Sporobolus*
- *Tephrosia*
- *Tetragonotheca*
- *Vernonia*

Flow chart of seed conditioning




Brush machine to
extract seed from fruits

Conditioning Equipment

Brush machine

Screens

Aspirator

Indent cylinder

Scarifier

Blowers

Amsonia ciliata, fringed bluestar

Aster tortifolius, white top aster

Coresopsis major, tickseed

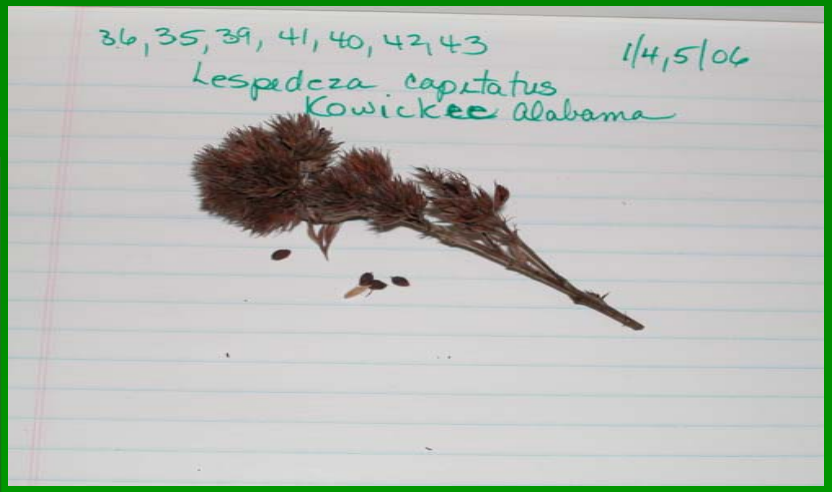
Seed coming out chute

Aspirating seed

Cleaned seed and trash

Chrysopsis gossypina, Cottony goldenaster

Lespedeza capitata



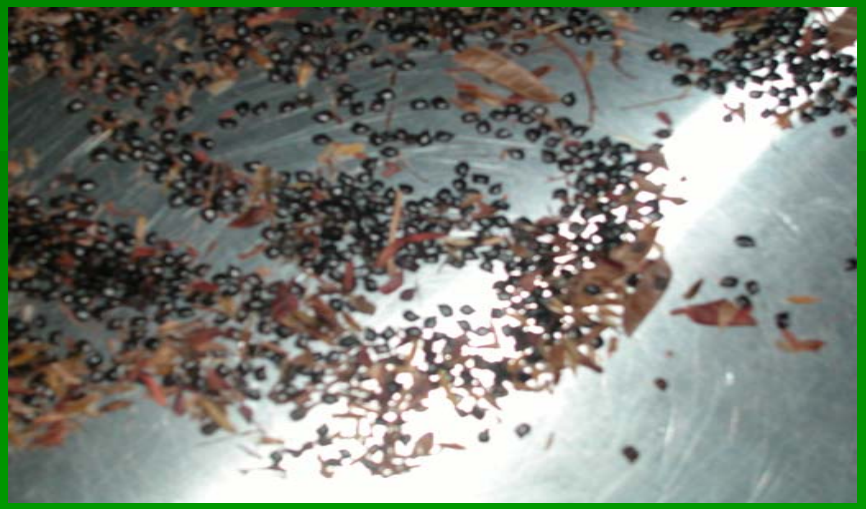
Seed

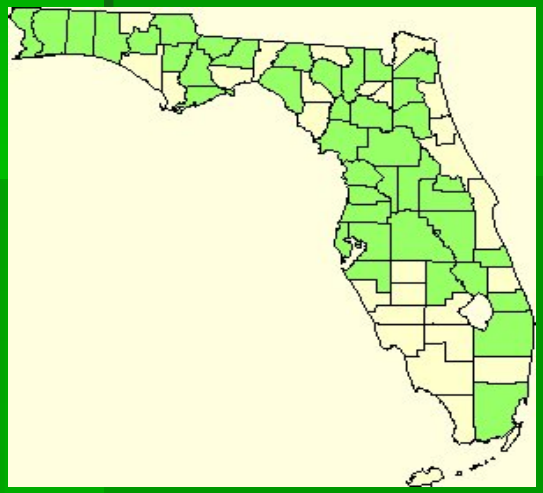
Picking out small trash

Lespedeza hirta, hairy lespedeza

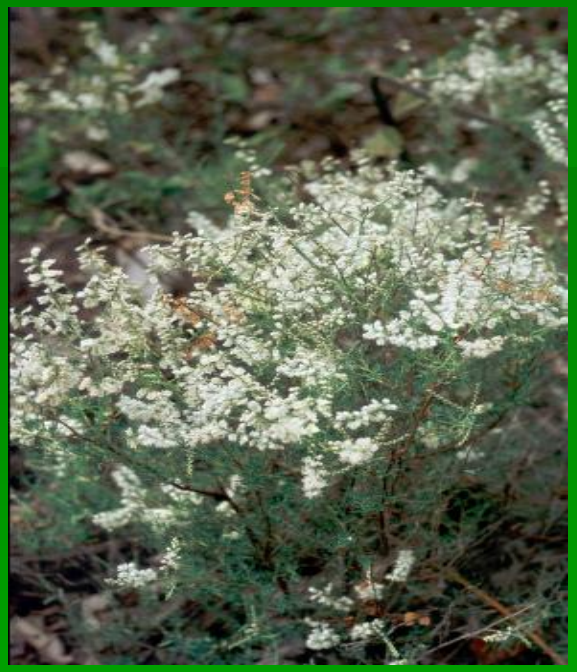
Liatris tenuifolia, blazing star

Mimosa quadrivalvis, sensitive briar





Polygonella americana, southern jointweed



Schizachyrium scoparium, little bluestem

Seed coming chute end of machine

Flowers with seed

Cleaned seed

Sorghastrum nutans, Indian grass

Tephrosia virginiana , Goat's Rue

Tetragonotheca helianthoides

Vernonia angustifolia, tall ironweed

American Tree Seedling Nursery

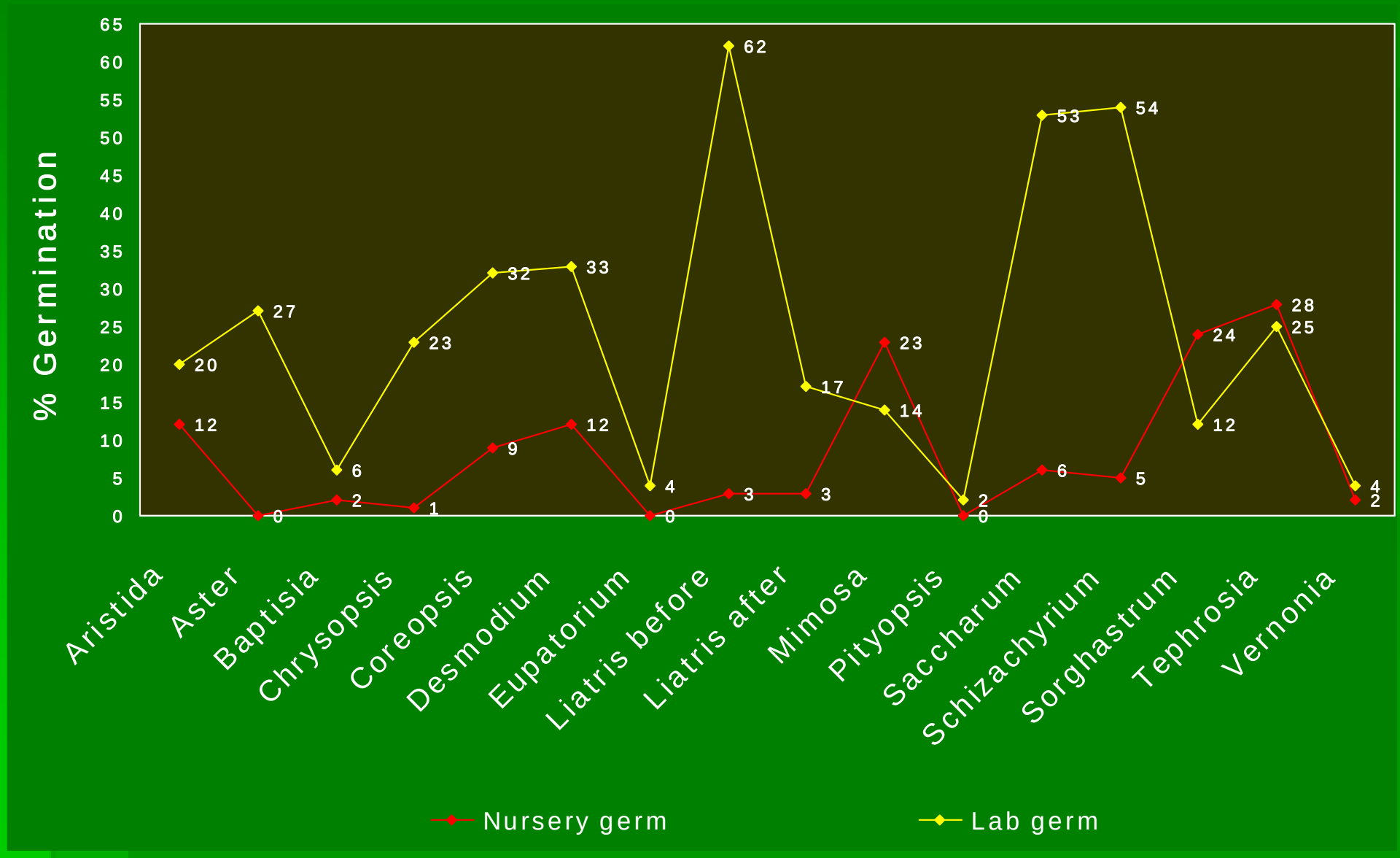
Ground layer plant nursery germination experiment

Nursery Seedlings

Nursery and Laboratory Germination Results

Species	Nursery % germ	Lab % germ	Comments	Comments
Aristida condensata	12	20		355 dormant after test
Aster tortifolius	0	27 20	No prechill; 28 day prechill	
Baptisia lanceolata	2	6 11	Brown Green	61% dormant 73% dormant
Chrysopsis gossypina	1	23	40% after cleaning	
Coreopsis major	9	32	65% dormant	27% after cleaning
Desmodium spp.	12	33 22	Brown Green	
Eupatorium album	0	4	40% dormant	
Liatris secunda	3	62	Before cleaning	17% after cleaning
Mimosa quadrivalvis	23	14		
Pityopsis graminifolia	0	2		
Saccharum alopecuroides	6	53 16	Caryopsis Whole seed	
Schizachyrium scoparium	5	54 49	Caryopsis Whole seed	
Sorghastrum nutans/ secundum	24	12	Caryopsis	11% after cleaning
Tephrosia virginiana	28	25		
Vernonia angustifolia	2	4	After cleaning	

Lab and Nursery Germination



Conclusions

- Use a softer mantle in brush machine for *Liatris*
- *Asteraceae* family difficult to clean- brush machine creates much debris
- Grasses clean easily in brush machine
- For multiple runs through brush machine, screen seed between each run to prevent seed damage
- Legumes clean easily in brush machine and Forsberg scarifier

Future of project

- Collect more seed but from fewer plants
- Determine best time to collect seeds
- Expand collection sites
- Fine tune the conditioning process
- Germination tests at different temperatures and prechilling
- Determine best time of year to plant seeds
- Fine tune nursery propagation
- Monitor nursery seedlings in the field