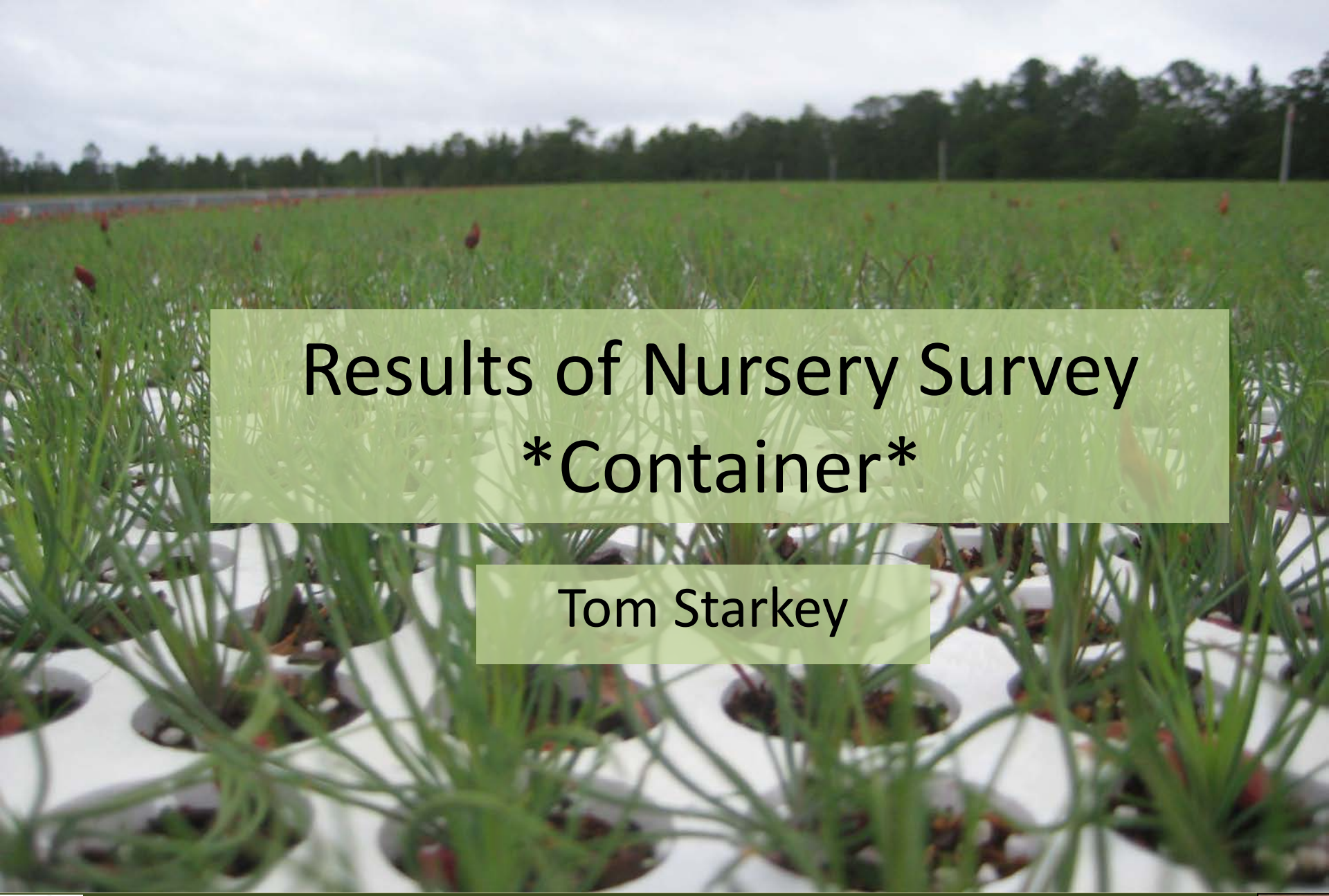


Results of Nursery Survey *Container*

Tom Starkey

Background to Nursery Survey

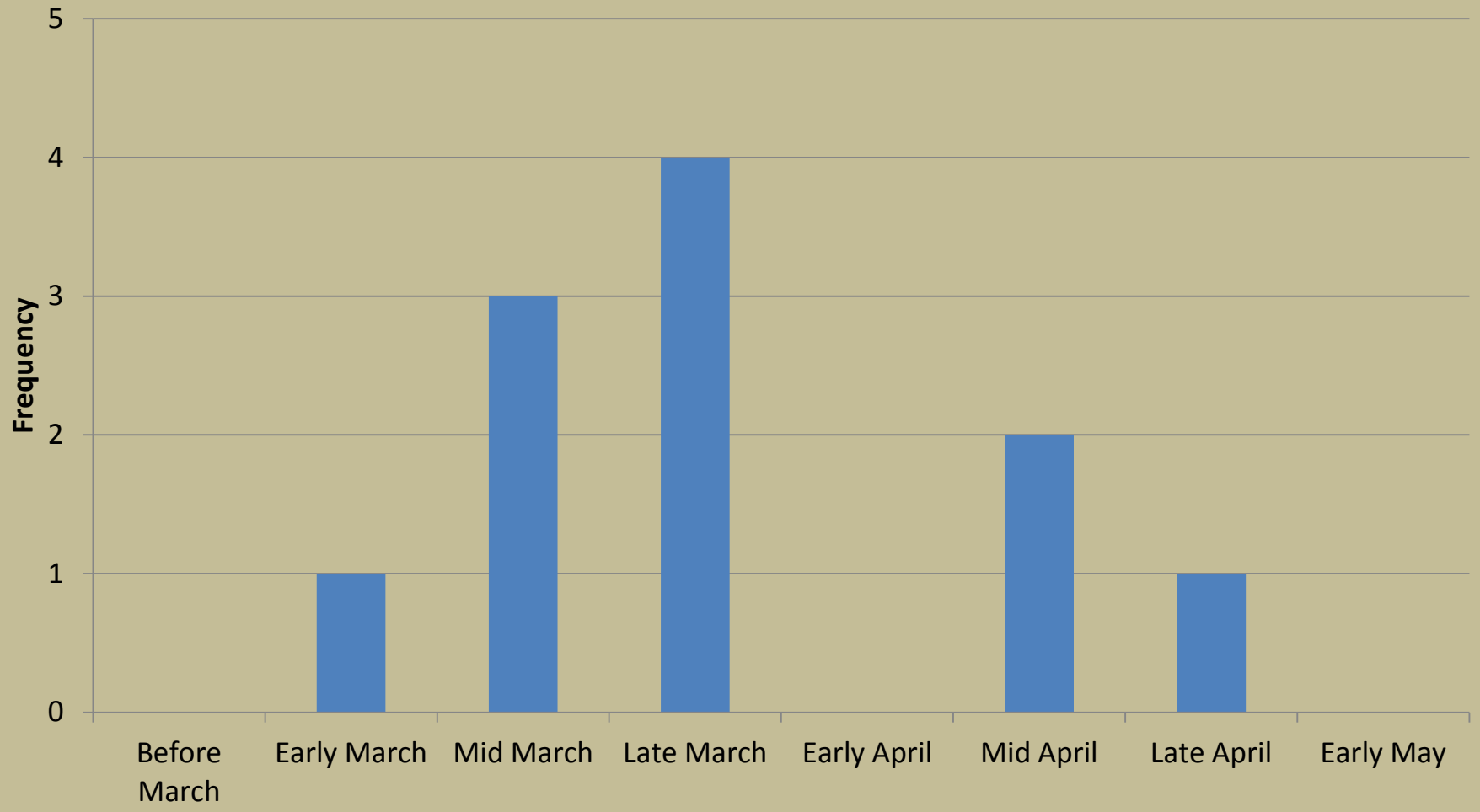
Previous Surveys:

- **1954** Abbott – Forest Tree Nursery Practices. 1956. *The American. Nurseryman.* Survey of all bareroot nurseries in US.
- **1964** Abbott & Eliason – Forest tree Nursery Practices in the United States. 1968. *JOF*. Survey of all bareroot nurseries in US.
- **1974** Abbott & Fitch – Forest Nursery Practices in the United States. 1977. *JOF.* Survey of all bareroot nurseries in US.
- **1980** Boyer & South – Forest Nursery Practices in the South. 1984. *SJAF*. Survey of bareroot nurseries 13 southern states.

Nursery Response

- Survey mailed:
  - Bareroot – 40
  - Container – 17
- Geographic Region - 13 states of the USDA Forest Service's Southern Region
- Surveys Returned:
  - Bareroot – 35
  - Container – 10
- Percent Coop/NonCoop 73%/27%

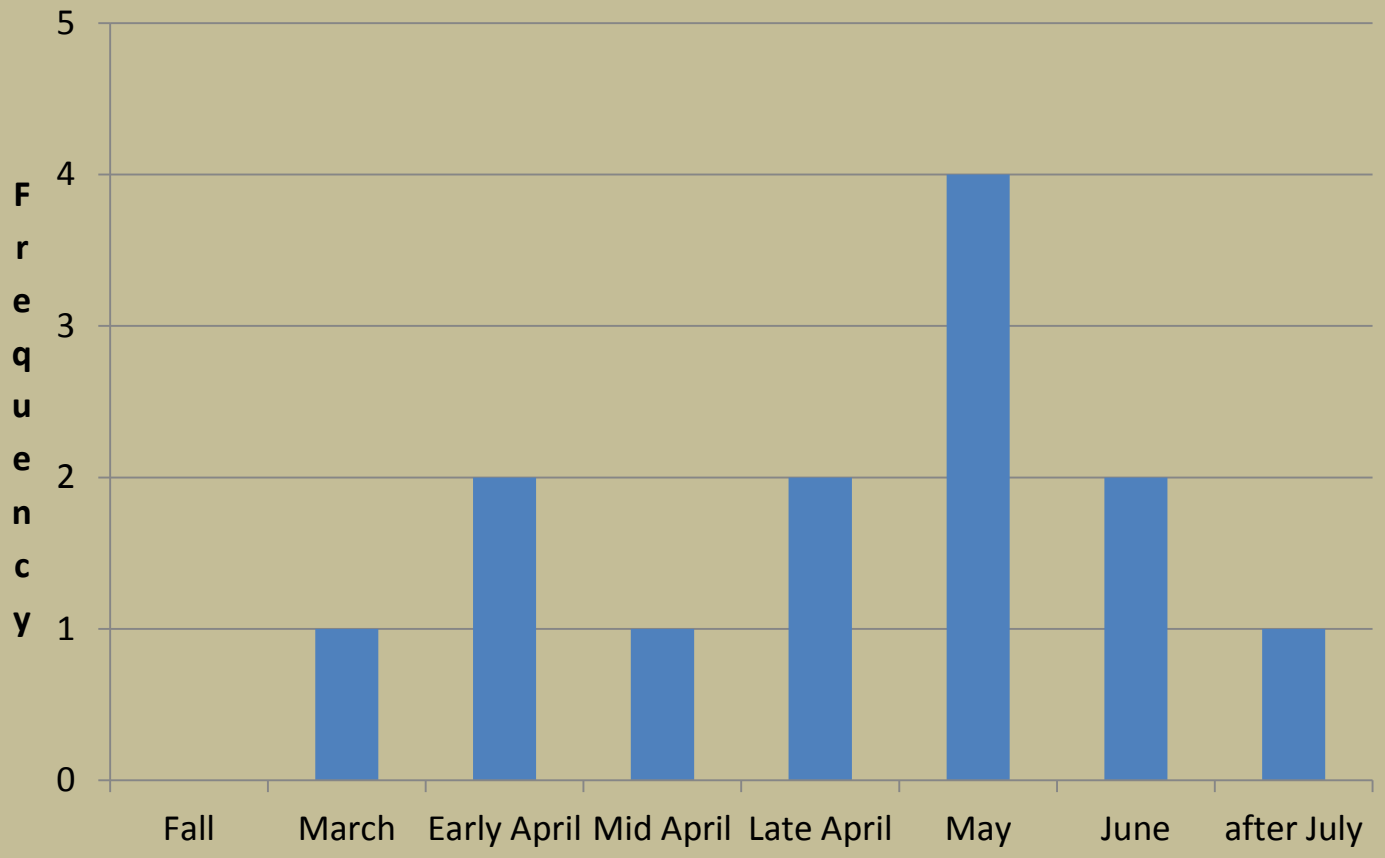
Start Sowing Pines



Sowing Pines

	Number of Nurseries
Vacuum Drum	5
Needle Sower	1
Gravity Drop	1
Vacuum/Gravity Drop	1
Hand Sow	5

Start Sowing Native Plants



Days to Sow

- For nurseries using 1 vacuum drum sower the average “seedlings” sown is 366,000/day
- For all other methods of sowing the average is 114,000/day

Sowing

- Germinate under shade cloth – 50%
- Vermiculite and sawdust most common capping material

Seedling Genotypes

		% grown
Loblolly	1st gen	4%
	2nd gen	33%
	3rd gen	22%
	Advanced	30%
Longleaf	Wild/Natural	73%
	Improved	27%

	% nurseries growing:
Loblolly	70%
Slash	20%
Longleaf	90%

Growing Containers

- Only hard plastic container = 60%
- Only styroblock = 10%
- Combination = 30%
- Average seedling density of hard plastic containers was between 50 and 55 seedlings/ft^2
- Average volume of hard plastic containers was 6 - 7 in^3
- Average seedling density of styroblock containers was 49 seedlings/ft^2
- Average volume of styroblock containers was 6.6 in^3

Growing Media

- 50% use large compressed “sky” bales
- 88% use a custom peat mix
- Average peat in mix was 68%
- Average pH of media was 4.7
- 80% use slow release fertilizer in media

Fertilization

	% of nurseries using
Top-dress media with granular fertilizer[1]	9%
Slow/controlled release fertilizer in growing media	18%
Combinations of slow release plus tractor/spray-applied foliar applications	64%
Combinations of slow release plus injector-applied fertilizer into irrigation	27%
Only tractor/sprayer-applied foliar sprays	0%
Only injector-applied fertilizer into irrigation	18%

[1] Some nurseries choose more than one method

Fertilization

- Most fertilizer applied through irrigation system is dry water soluble
- 82% applied a single element in response to a nutrition problem (Iron – most common)
- 73% have tried fall fertilization
- 50% of nurseries evaluate their seedling nutrition 2 times a year. 40% - 3 times a year

Irrigation

- Type of irrigation:
  - Stationary head – 70%
  - Center Pivot – 40%
  - Traveling boom – 20%

- Source of irrigation water:
  - Well - 50%
  - Surface pond – 30%
  - River – 20%

Irrigation

- 80% irrigated every day during germination.
- Target to irrigated during germination - 40% of plug. Only 30% aim to keep the top 20% wet.
- During growing season the target to wet is 93% of plug.
- During shipping 40% alter the frequency of irrigations. 60% alter both frequency and amount.

Irrigation

- 50% would consider irrigating at night.
- 80% irrigate to cool seedlings in summer
- Target temperature is 94F
- All nurseries said seedling growth slowed or stopped in hot weather.
- 70% of container nurseries monitor water usage.
- 30% are concerned about water/fertilizer runoff.

Pine Culture

- Top Prune Loblolly – 86%
- Top Prune Longleaf - 80%
- 44% begin top pruning in July
- 36% only top prune crop one time
- 56% have not received customer concerns about multiple leaders
- Target RCD in November – 4.5 mm; in January 5.1 mm

Container weeds & herbicides

- Temporary labor does nearly all handweeding
- 2 nurseries indicated that the permanent staff does all the weeding
- 3 Primary weeds:
  1. Black Willow - 70%
  2. Grass – 50%
  3. Spurge - 50%

Container weeds & herbicides

- Primary Herbicides
  1. Goal – 60%
  2. Goal Tender – 50%
  3. Grass Herbicides – 50%

Disease Control

- Average loss – < 3%
  - Birds – 90% of nurseries reported - 44% of total loss
  - Pre and Post Damping off accounted for 33% of loss
- Fungicides:
  - 60% Banrot
  - 40% Proline
  - Abound/Heritage, Aliette, T-methyl, Cleary's

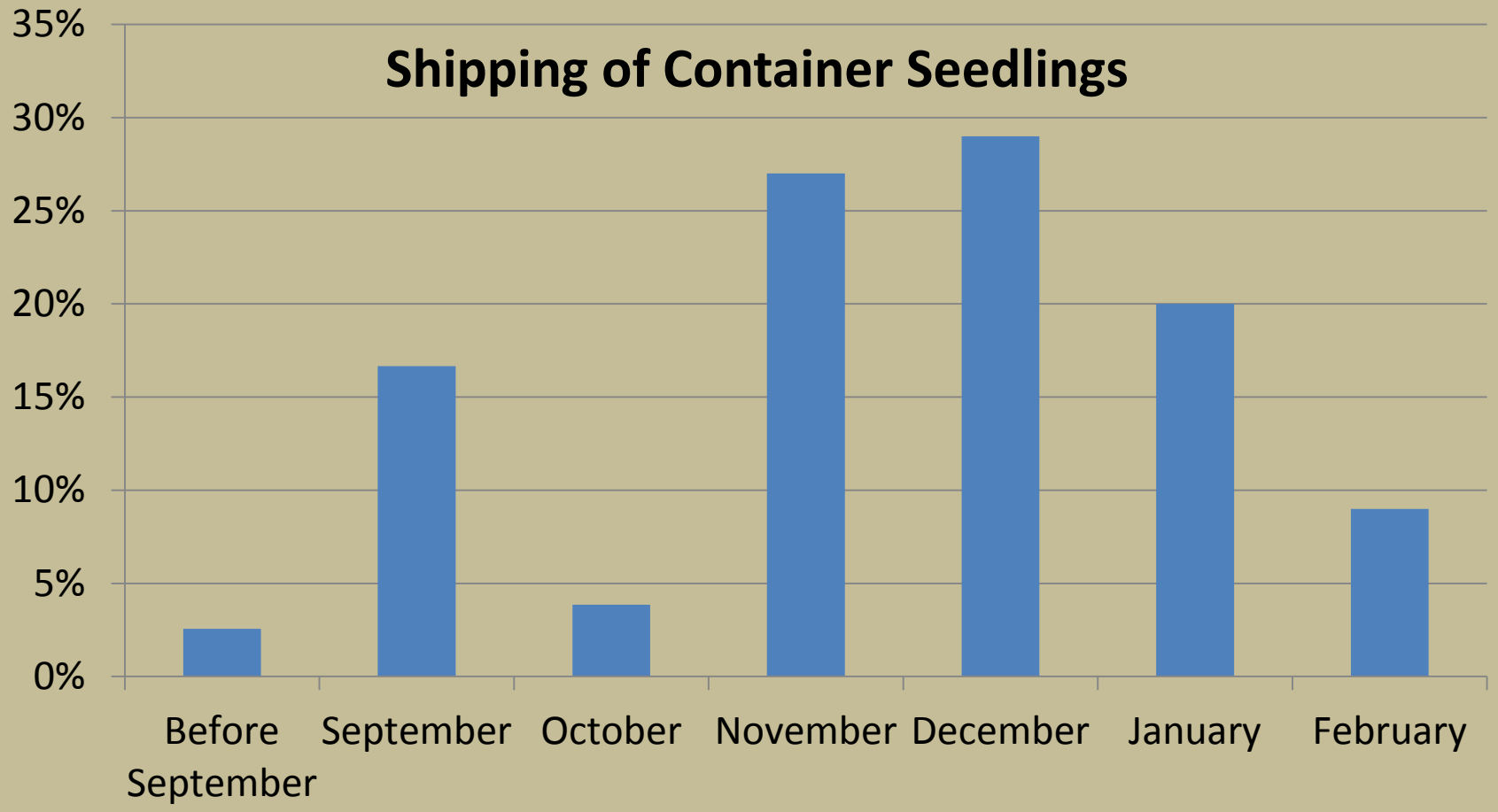
Disease Control

- Diagnosis:
  - AU Coop – 50%
  - Water's, A&L, State Lab, Internal - 30% each

Insect Control

- Average loss - 70%
  - Pine Tip Moth – 68%
  - Sawflies & Cutworms - 54%
  - Lygus – 41%
- Insecticides
  - Permethrin – 70%
  - Asana – 30%
  - Chloropyriphos - 40%

When are seedlings shipped?



Shipping

- 40% on field pack
- 30% only shed pack
- 30% both

- 70% have cooler storage available

- All packed in boxes – average/day – 154,000 seedlings (>500 boxes/day)

Use of Temporary Labor

Time	Average Percent	Primary Source
Sowing	30%	Local
Summer	8%	Local
Shipping	62%	Migrant

Concerns about use of temporary labor

1. Lack of attention to details
1. Labor costs (Cost have increase 6-8%)
3. Available when needed

THANK YOU!!!

- For your participation in the survey
- Your response will remain confidential.
- Next step – prepare a paper discussing container nursery practices. Also how regulations have impacted nursery culture.