Pine Tip Moth and Ant Control

Professional Vegetation Management
BASF Corporation

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Nantucket Pine Tip Moth

- Infests loblolly, shortleaf and Virginia pines
- Occurs in the early years of plantation establishment
- Female deposits eggs on needles and shoots
- The larvae bore into the tips of branched and leaders
- Larvae pupate in the bored holes and emerge as adults
- Result in death of actively growing pine tissue
- Two - five generations per year in the South
- On intensively-managed sites (weed control & fertilization), damage levels tends to be greater
- Results in decreased pine growth and an increase in stem deformity
- Once trees reach a height of 15 feet, tip moth problem usually tends to subside.

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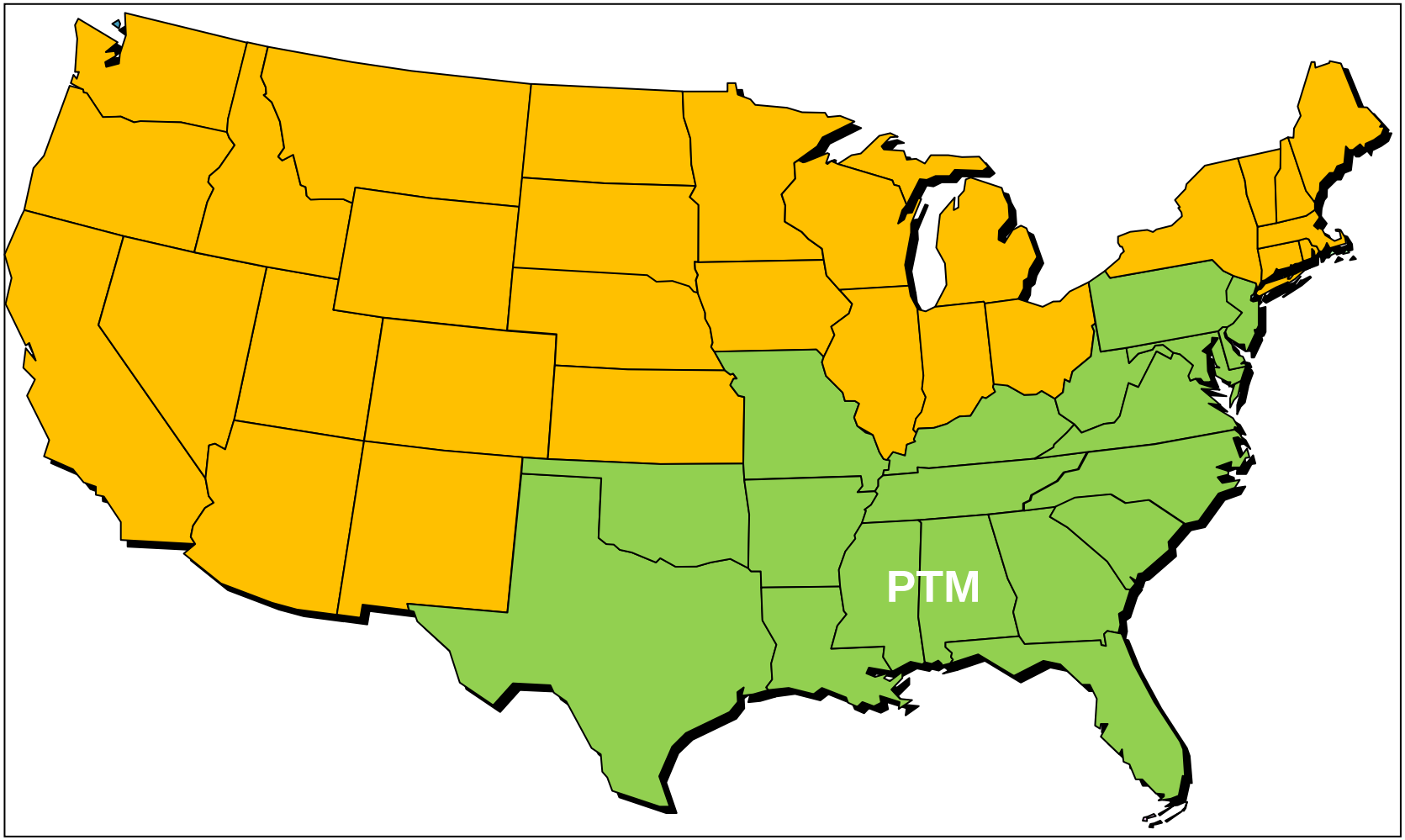
PTM Review

- For control of Nantucket Pine Moth and Pine Bark Aphid at planting on forest sites and Christmas trees
- For control of Leaf Cutter Ants and Imported Fire Ants on forest sites and Christmas trees
- Water based suspension concentrate
- Active ingredient: Fipronil
- Signal word: Caution
- Use rate:
  - 21 fl oz (621 ml) per acre OR 1.4 ml per tree
- Applications
  - Tip Moth and Pine Bark Aphid
    - At time of planting or soon after planting for bare root trees
    - Injected into root-ball during grading for containerized trees
  - Leaf Cutter and Imported Fire Ants
    - Inject into mounds as needed

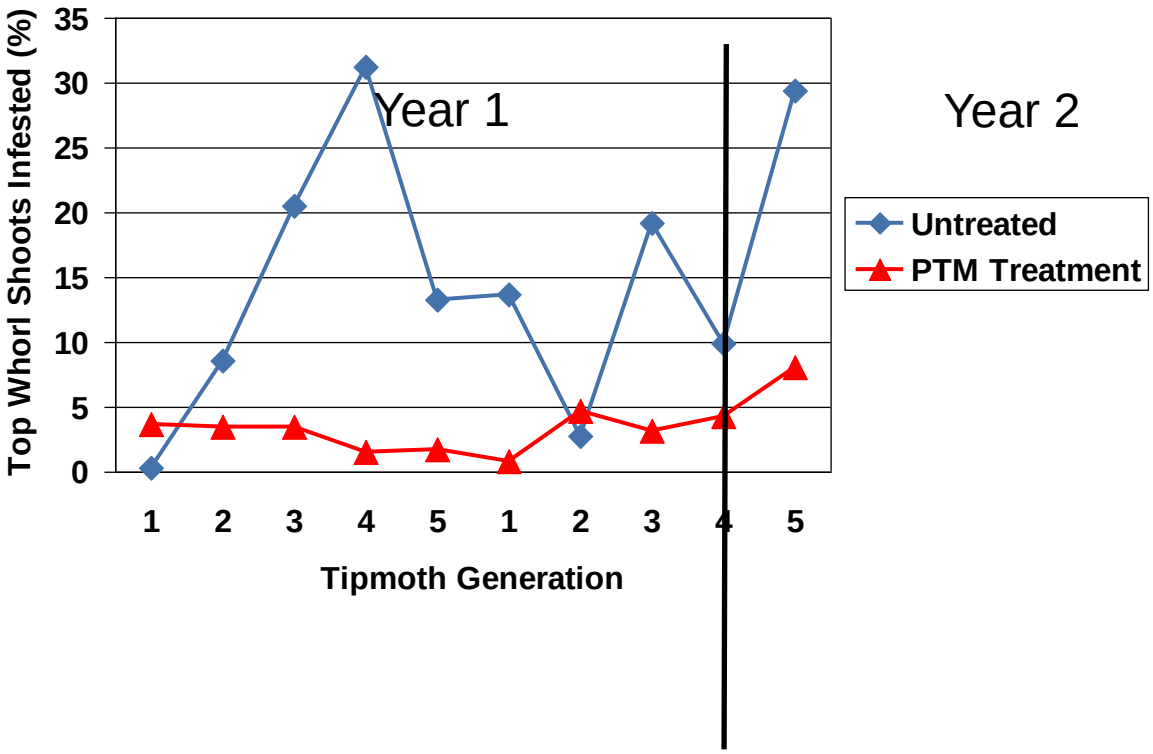
PTM State Registrations



PTM State Registrations

PTM Soil Injection

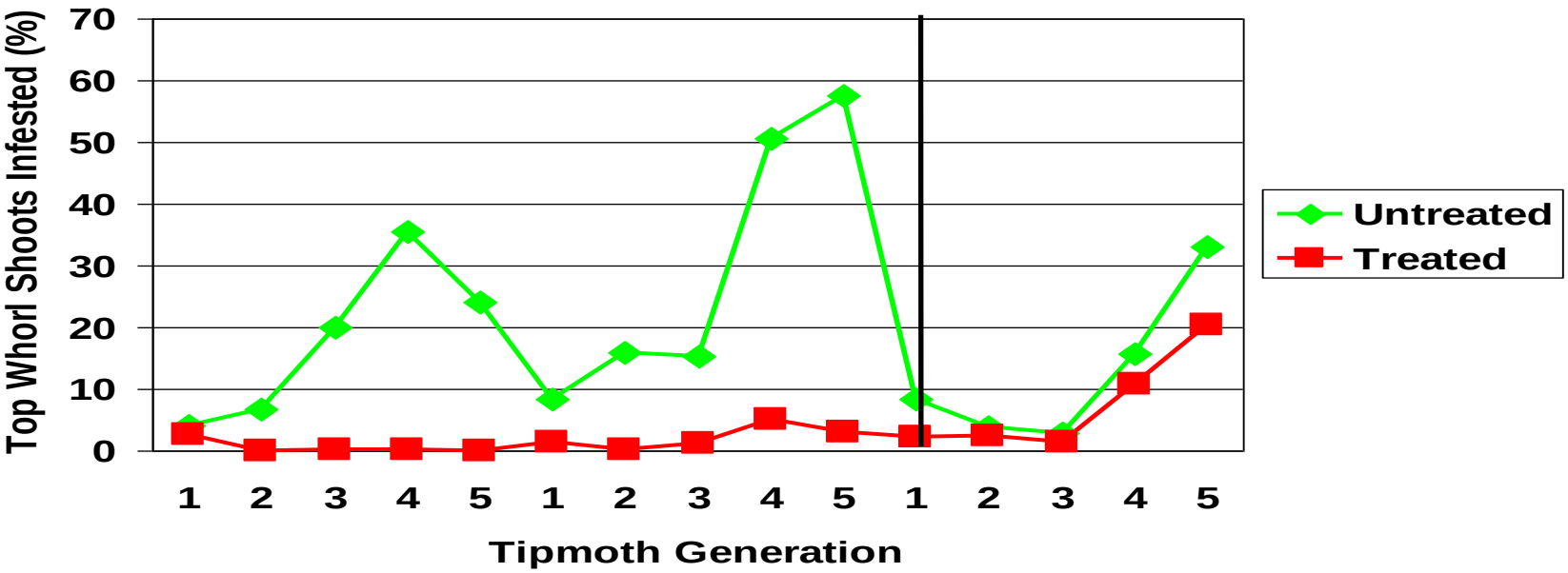
Two Years of Protection



West Gulf Pine Pest Management Cooperative. Mean of 2 installations.

PTM Insecticide

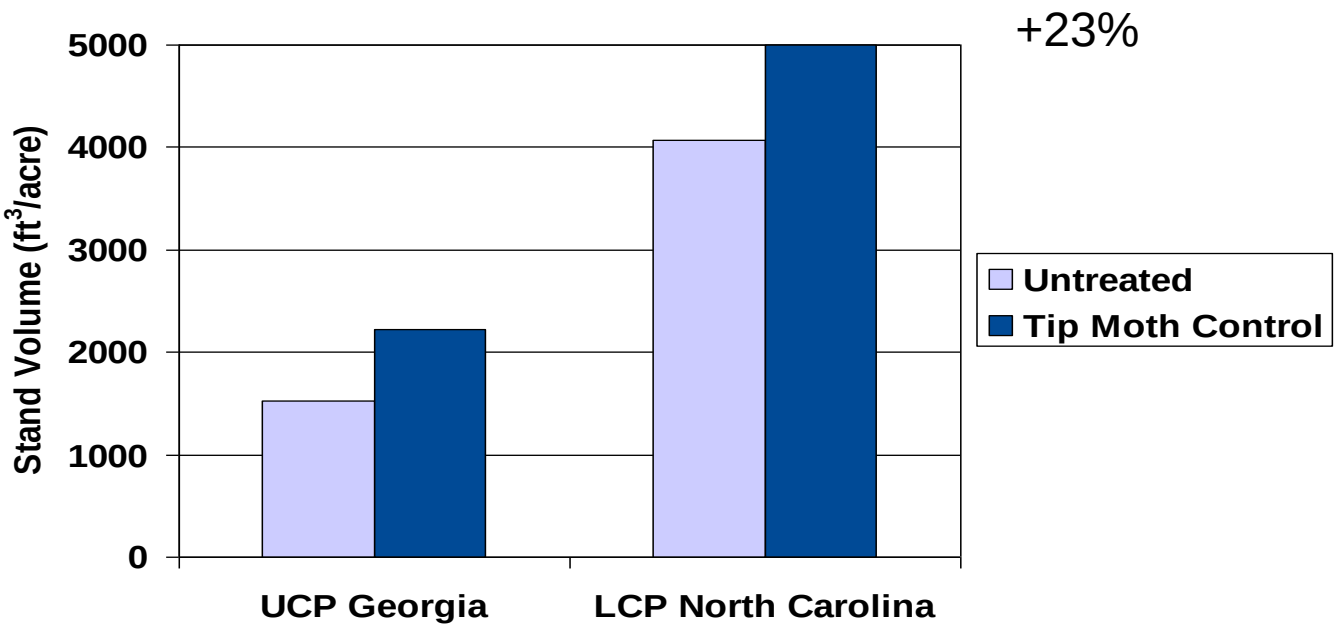
Soil Injection



West Gulf Pine Pest Management Cooperative. Mean of 4 installations.

Response to Tip Moth Control

Loblolly Pine at Age 15 Following Control in Years 1-3



Wayne Berisford, U. Georgia; Scott Cameron formerly International Paper and others.

ROI: PTM applied at planting

15-Year Response Period

Real annual rate of return

		Treatment Cost /Acre		
Response	**Stumpage**	**$50**	**$60**	**$70**
ft³/acre/yr	***… $/ton …***	***……. ROI (%) …….***		
60 ft³	**12**	**10.8**	**9.5**	**8.0**
	16	**11.6**	**10.4**	**8.8**
	20	**12.6**	**11.4**	**9.8**
	24	**13.9**	**12.6**	**11.0**

60 ft³=1.8 ton

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PTM Application Rates

Soil Injection

Nantucket Tip Moth and Pine Bark Aphid Control in Pine Seedling Plantations

Apply a dilution of water and 21 fl ozs per acre **PTM Insecticide** at the time of planting or after planting. Divide 21 fl ozs by the total number of target pine seedlings to be treated per acre to obtain the amount of **PTM Insecticide** to apply per pine seedling. Refer to **Table 1**. Dilute the required amount of **PTM Insecticide** with water to apply between 0.5 and 1.0 fl oz of total dilution per pine seedling. Spot treat by injecting an amount of dilution at least 3 inches below ground into the rooting zone of each pine seedling.

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PTM Application Rates

Soil Injection

Table 1. Application Volume based on Target Pine Seedlings Planted per Acre				
Target Plants per acre	PTM Insecticide + Water Total Volume		PTM Insecticide	Water
	per plant	per acre		
	(fl ozs)		(fl ozs each mixed per acre)	
400	0.5	200	21	179
	1.0	400		379
500	0.5	250		229
	1.0	500		479
600	0.5	300		279
	1.0	600		579

NOTE: Use the higher volume when soil moisture level is low.

PTM Application Rates

Keeping the rate per tree constant at 1.4 ml

- Apply 0.5 fl oz (15 ml) of total dilution per tree made up as follows:
  - 13.6 ml water + 1.4 ml PTM
- This is a PTM dilution rate of 9.3%

Total Dilution (water + PTM)	PTM at 9.3%	Number of trees treated
1 qt	3 fl oz	64
1 gal	12 fl oz	256
5 gal	60 fl oz	1280

Do not exceed 21 fl oz (621 ml) PTM per acre

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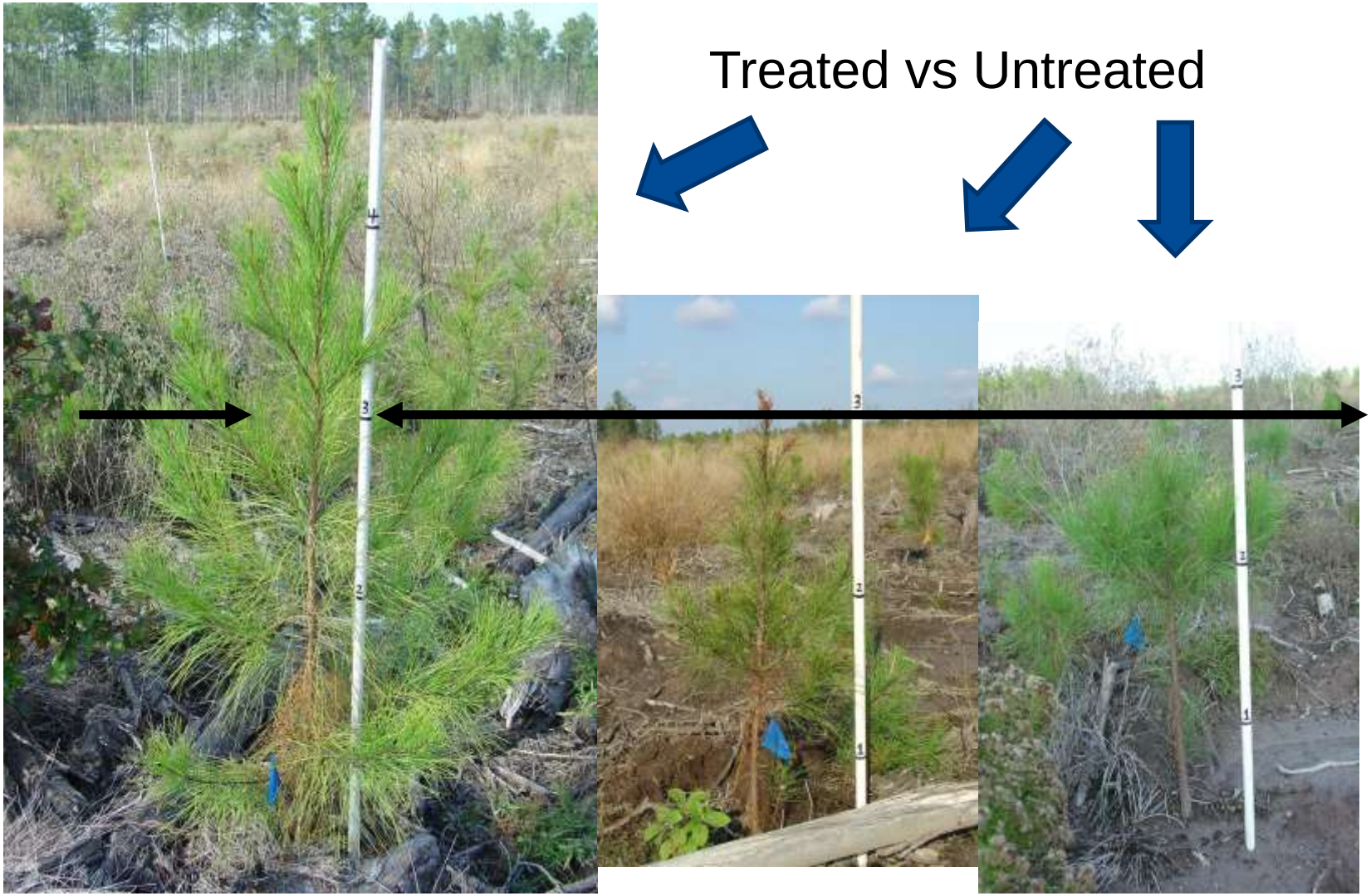
PTM Application Rates

Soil Injection



PTM Application

PTM Application
with Spot Gun

PTM Application

- PTM application with hand crews
- Felton Equipment

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PTM Application

- PTM injection 3” to 4” below soil and next to root zone
- Felton Gun

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PTM Application

- Felton spray gun and backpack
- Felton wand tip

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PTM Application

PTM applied into planting slit

Machine planted pine seedling

The Ideal Way to Get Immediate Tip Moth Protection

Containerized Tree Root-ball Injection

Containerized Tree Root-ball Injection

Containerized Tree Root-ball Injection

Containerized Tree Root-ball Injection

Containerized Tree Root-ball Injection

PTM Application Rates

Root-ball Injection

Table 2. Injection Volume based on Treated Pine Seedlings Planted per Acre			
Treated Pine Seedlings (plants per acre)	**PTM™ Insecticide Maximum Volume per Pine Seedling Root Ball** (fl oz)	(mL)	**Maximum per Treated Pine Seedling** (lb ai)
300	0.07	2.05	0.00043
400	0.05	1.54	0.000325
500	0.04	1.23	0.00026
600	0.035	1.03	0.000217

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PTM Results

Containerized Tree Root-ball Injection

- Field data has confirmed results are similar or better than soil injection after planting
- Benefits
  - Tree is protected immediately
  - Save field application cost

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Research Efforts in 2007 - 2010

- Evaluate efficacy of PTM™ applied to containerized seedlings.
- Evaluate efficacy of PTM™ applied one year after planting at different rates, placement, volume.

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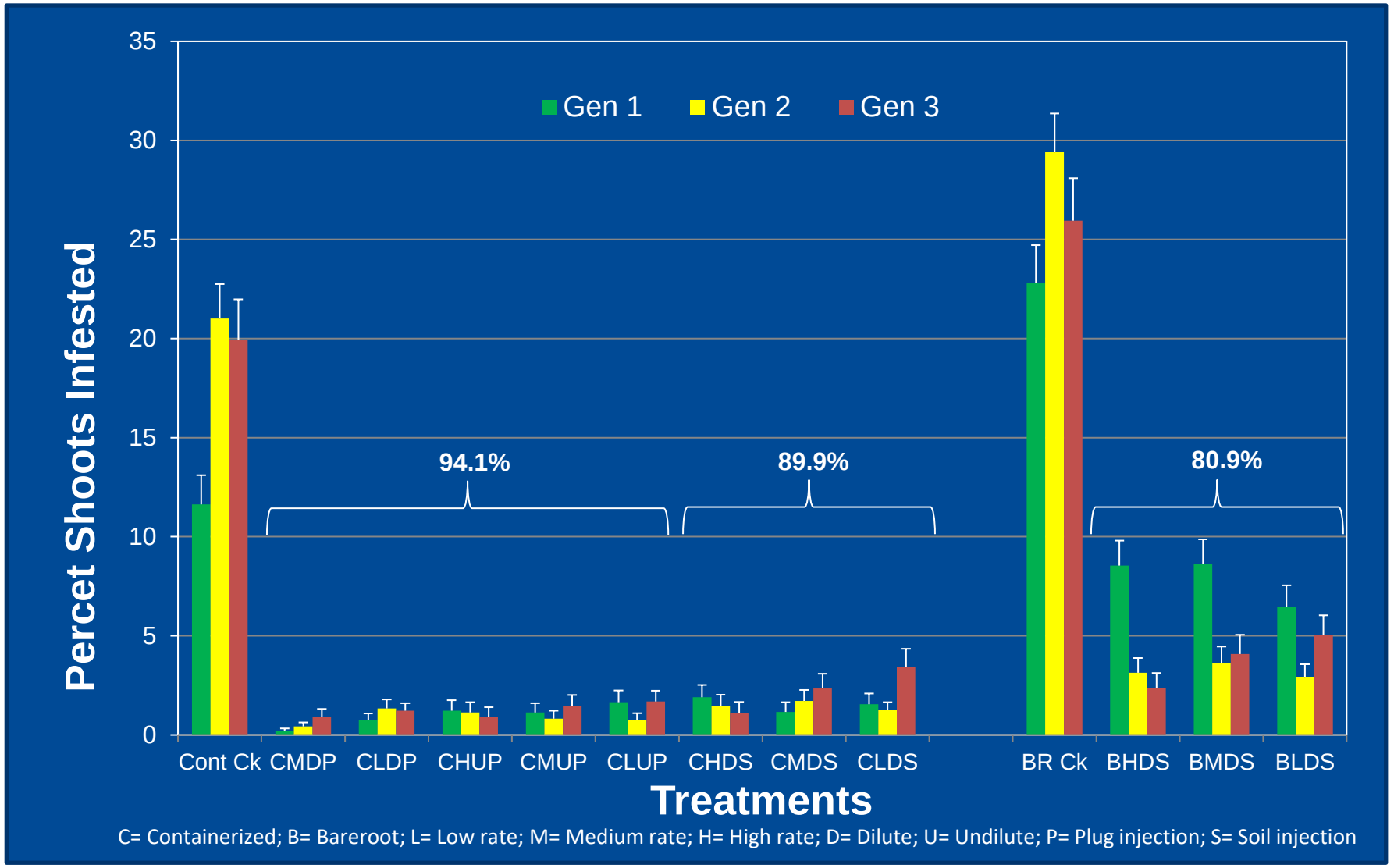
Plug Injection Trial

Site Distribution - 2011

Root-ball versus Soil injection Treatment

10 sites: Gen 1-3, 2011



Tracking Progress

End of Year 1

End of Year 2

Mid-Year 4

Tracking Progress

3 1/4

Container 3ml Q clone

4 3/4

Container 15ml Q clone

2 3/4

Container Check Q clone

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Tracking Progress

Bareroot Soil Inj Q clone

Bareroot Check Q clone

Results

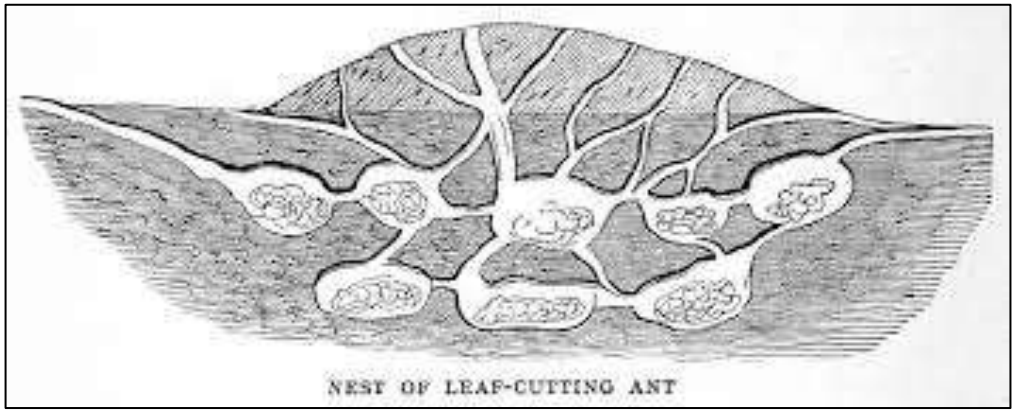
- PTM placed in the plant hole or as a root-ball injection work best and for the longest duration (3+ years)
- PTM applied after planting is best placed shallow (4 inches deep) and at higher rates (30 ml). Duration of control is reduced (<2 years) compared to plant hole treatments
- Operational treatments in conjunction with machine planting have been inconsistent. Work is needed to improve the machine planter system
- Root-ball injection of containerized trees, treated in the nursery eliminates the field application cost and provides immediate protection

Pine Bark Aphid

- PTM controls all species within the genus Cinara
- Based on the states where PTM is labeled, the most likely species to protect is white pine
- Does little damage to healthy trees, however heavy infestations in plantations in NC resulted in reduced growth measured 2 years after planting.

Pine Bark Aphid

Leaf Cutter Ants



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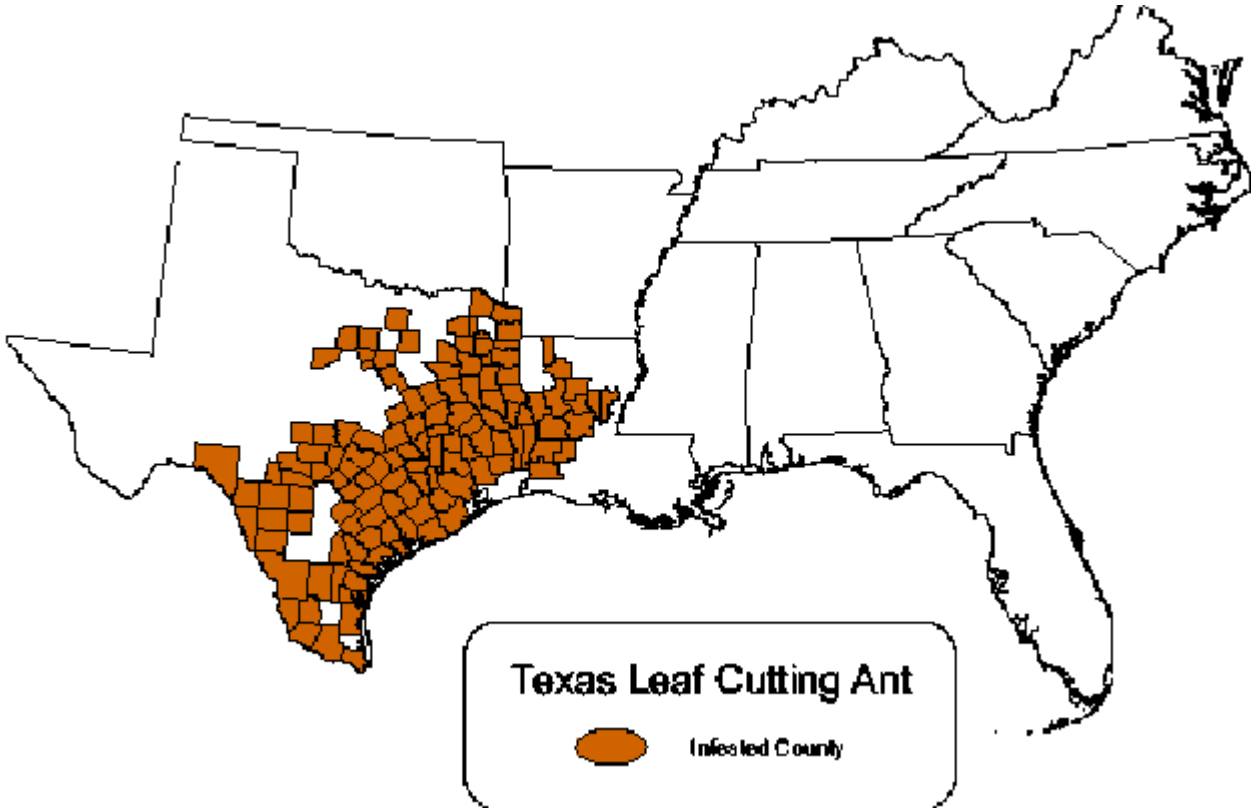
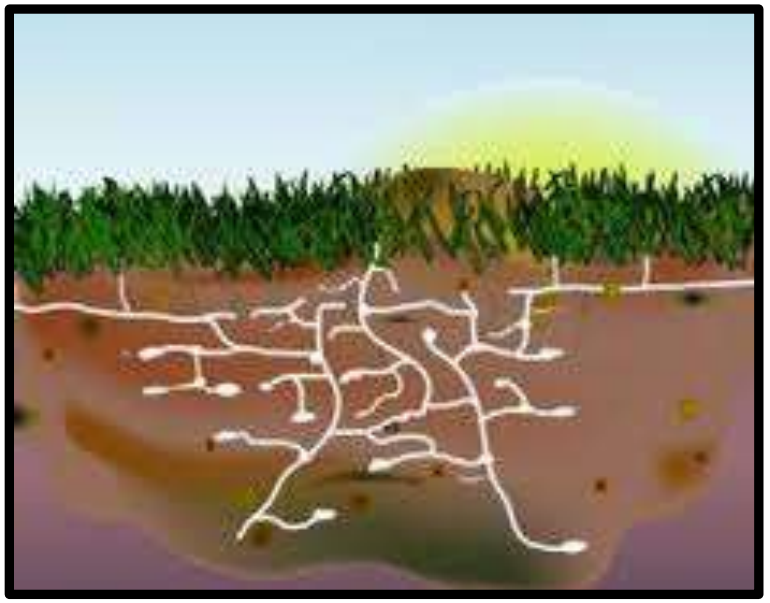
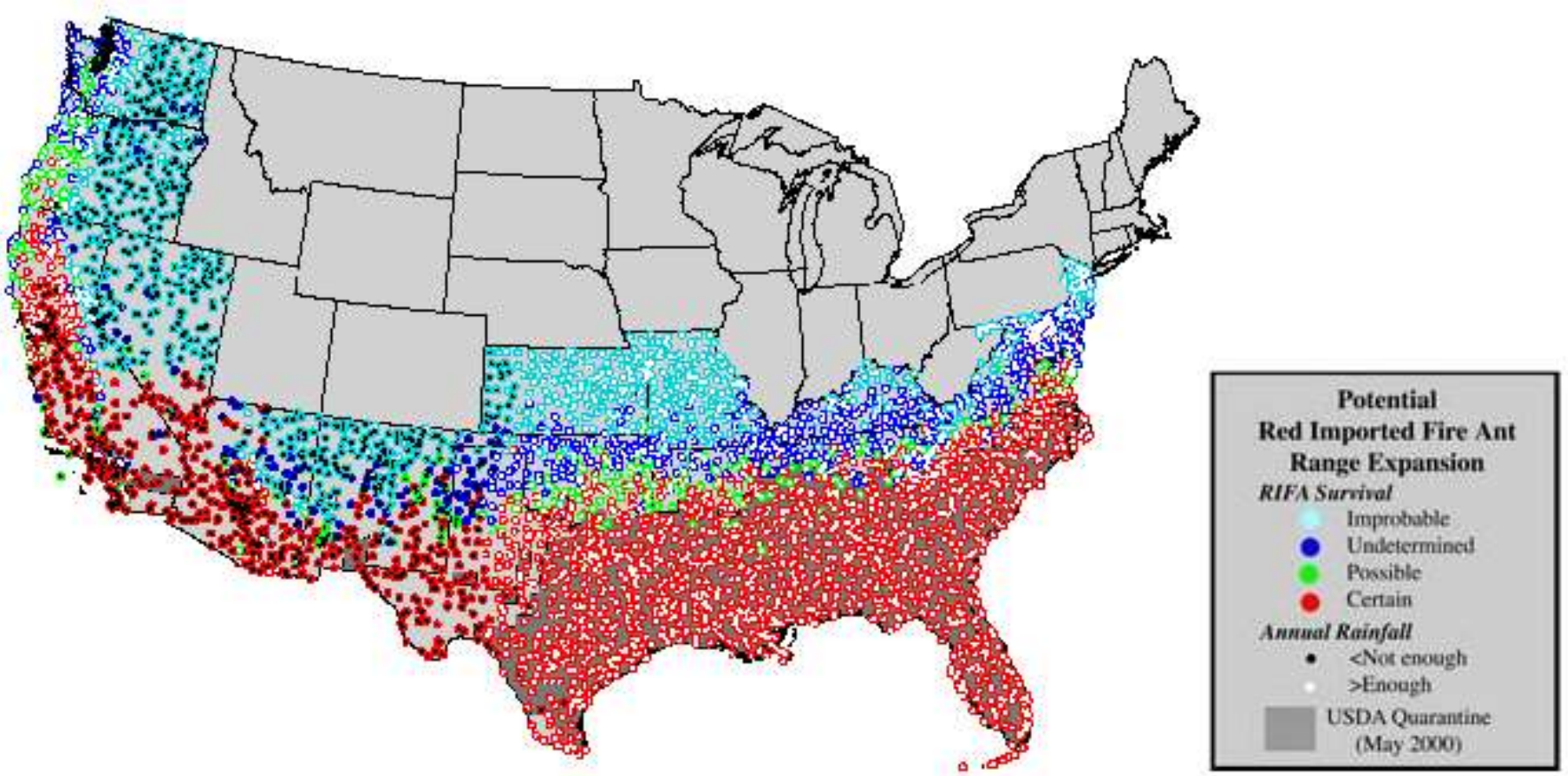
Leaf Cutter Ants



Red Imported Fire Ants



Fire Ants



Leaf Cutter and Fire Ant Control

Leaf Cutter Ant and Red Imported Fire Ant Control in Pine Seedling Plantations

Make a 2% dilution of **PTM Insecticide** in water. Refer to **Table 3**.

For leaf cutter ant control, inject 1.5 fl ozs of the dilution at least 3 inches below ground into each leaf cutter ant exit hole.

For red imported fire ant control, inject 3 fl ozs of the dilution at least 3 inches below ground divided among 2 injections for small colonies (mounds 12 inches wide or less) or 4 injections for larger colonies (mounds more than 12 inches wide).

DO NOT apply more than 21 fl ozs **PTM Insecticide** per acre per year.

Leaf Cutter and Fire Ant Control

Table 3. 2% Dilutions for Leaf Cutter Ant and Red Imported Fire Ant Control				
Total Volume (gals)	**PTM** (fl ozs)	**Water** (fl ozs)	**Leaf Cutter Ant Exit Holes to Treat**	**Red Imported Fire Ant Mounds to Treat**
1	2.6	125	85	43
2	5.2	250	170	85
3	7.8	375	255	128
4	10.4	500	340	170
5	12.8	625	425	213

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PTM Summary

- Root-ball injection (containerized) provided, immediate, consistent, long-term control
- Injection into the planting hole provided long-term control but allowed damage from the first generation of tip moth
- Injection after planting, in the vicinity of the root zone, provides shorter term control and allowed damage from the first generation of tip moth
- Injection into the mounds for Leaf Cutter and Imported Fire Ants provided consistent control
  - Note that re-infestations can occur from outside treatment area

Questions?

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