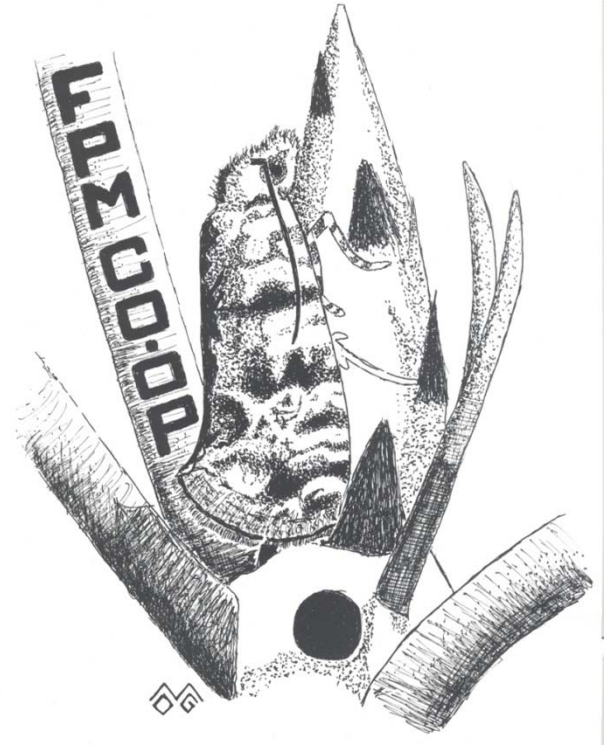
FOREST PEST MANAGEMENT COOPERATIVE

2011 Executive Committee Meeting



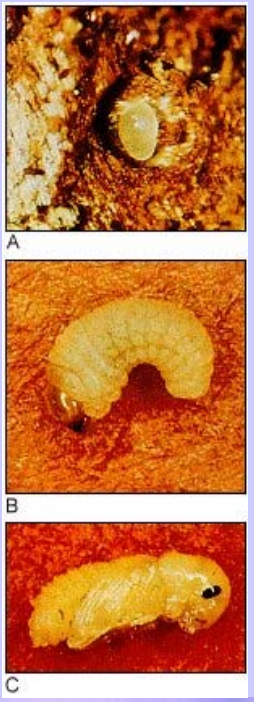
April 19 - 20, 2011
Texas Forest Service
Lufkin, TX

Agenda

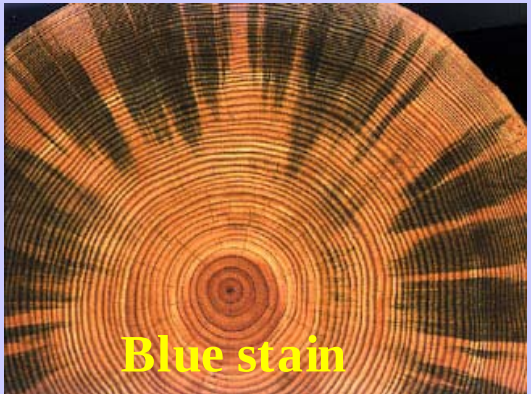
- Introductions.
- Pest Activity in 2010
- Overview of recent FPMC accomplishments
- Discussion of 2011 research proposals
- Containerized Seedling Plug Injection System
- FPMC & Forestry Pesticide Web Sites
- Training needs (?)
- Other items (?)

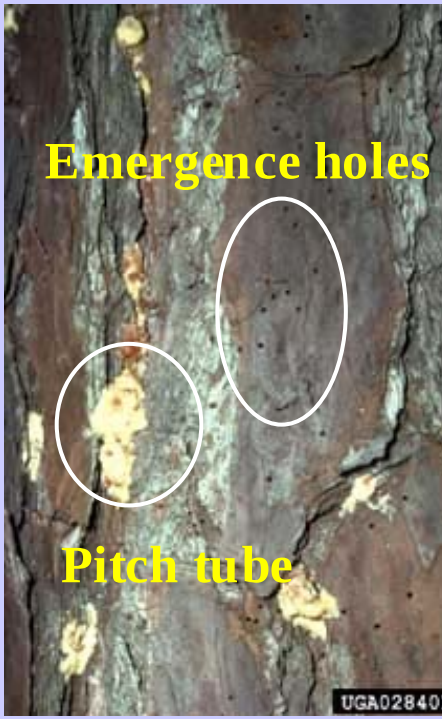
Southern Pine Beetle
Dendroctonus frontalis

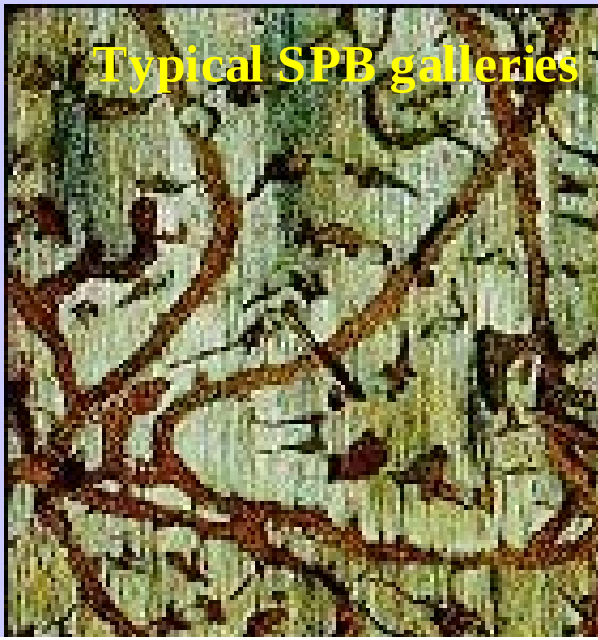
SPB life stages



Typical SPB expanding spot







Southern pine beetle infestations by state, 2001 - 2010 and latest trend.

State	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Latest Trend
OK	0	0	0	0	0	0	0	0	0	0	Stable
AR	0	0	0	0	0	0	0	0	0	0	Stable
TX	0	0	0	0	0	0	0	0	0	0	Stable
LA	0	0	0	0	0	0	5	1	1	0	Stable
MS	143	689	65	158	92	50	208	31	0	10	Up
AL	11,849	4,991	206	1,434	1,791	1,286	765	222	9	22	Up
GA	4,938	9,070	333	73	0	0	2,077	115	24	4	Down
TN	12,746	6,394	1,294	257	5	14	39	1	0	0	Stable
KY	3,456	NA	NA	0	0	0	0	0	1	0	Stable
VA	763	274	50	10	0	0	64	33	25	25	Stable
FL	2,892	650	2	10	7	3	43	22	15	1	Stable
SC	22,270	67,127	9,514	4,324	2,388	2,267	734	990	142	0	Down
NC	3,871	4,028	181	10	24	49	15	131	5	5	Stable
Total	62,928	93,223	11,645	6,276	4,307	3,669	3,950	1,546	222	67	Down

Extensive pine mortality occurred across the South (particularly in Arkansas, Louisiana, Georgia and Florida) in 2010.

Mortality was attributed to *Ips* engraver beetles, but stress factor was likely drought.

Shoot dieback and tree mortality reported in stands of different ages (6 – 20) near Crossett, AR.

Shoot dieback likely due to pitch canker disease. Wounds caused by cerambycid/weevil feeding may have allowed entry of pathogen. Tree mortality due in part to *Ips* and deodar weevil attacks.

FPMC Research Projects - 2010

Ants

Leaf-cutting ant; Imported fire ant

Systemic Pesticide Injection

Seed Orchard; *Ips; Dendroctonus;* Oak; Invasives

Regeneration Weevil

Control

Tip Moth

Impact; Hazard Rating; Control

Leaf-cutting Ant Control

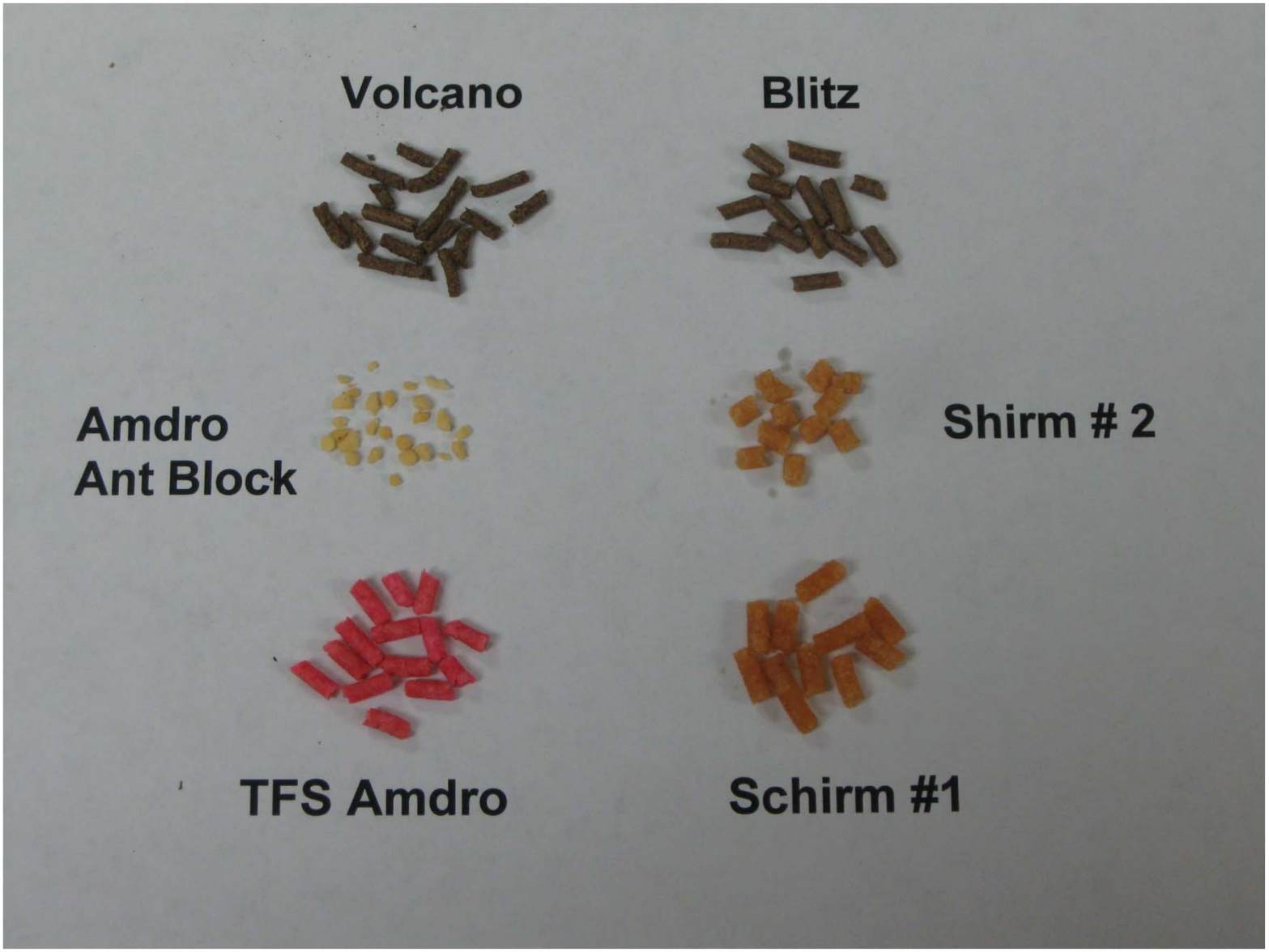
Leaf-Cutting Ant: 1996 - 2010

Objective

- **Evaluate and register one or more alternatives to methyl bromide and Amdro® Ant Block for control of the Texas leaf-cutting ant.**

In 2010, confirm efficacy of modified Amdro® bait and PTM™ soil injection treatments in the winter, spring, summer and fall.

Different Leaf-cutting Ant Baits

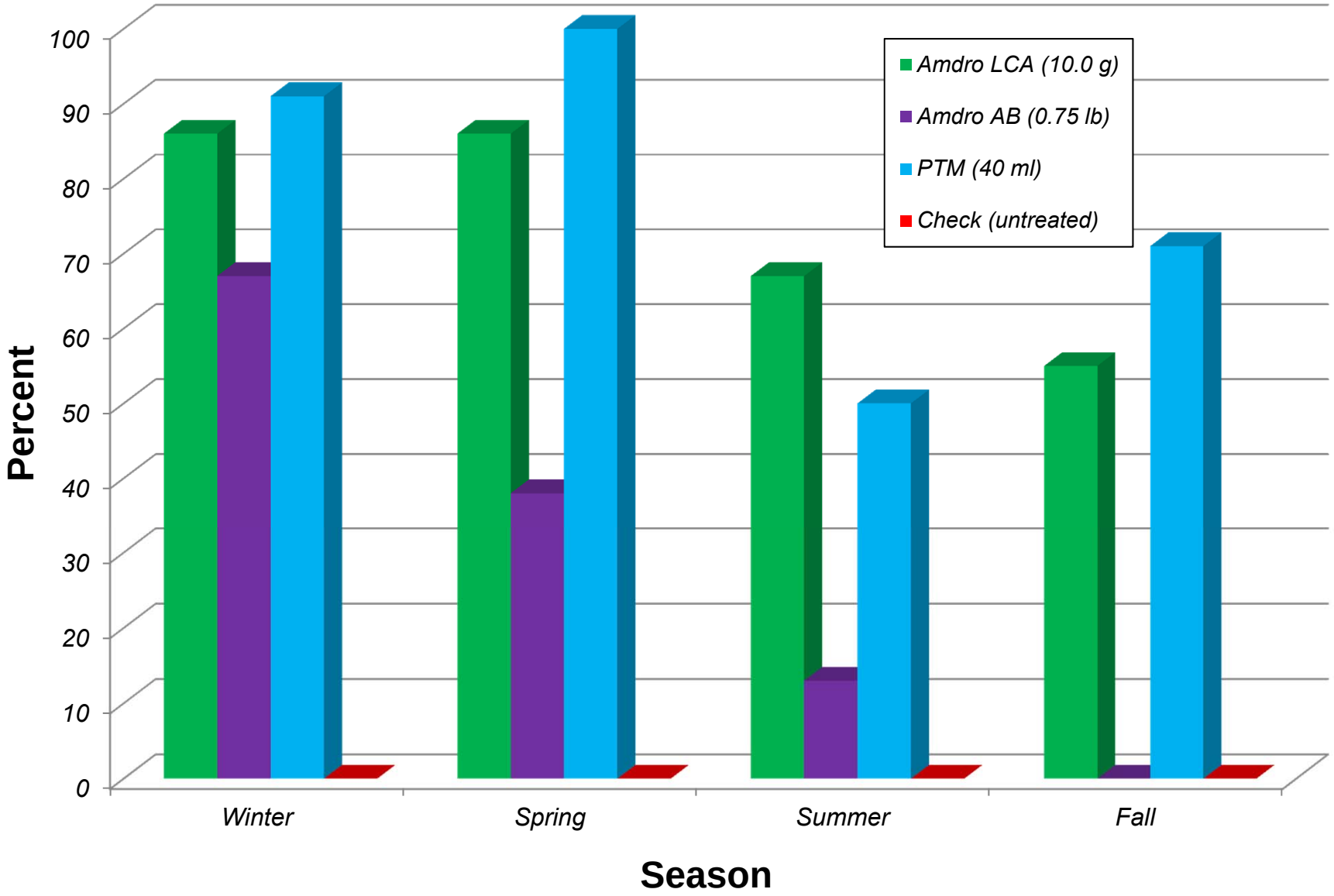


PTM™ (fipronil) solution applied to entrance holes within the Central Nest Area at 40 ml per hole.

Efficacy Trials – 2010

	Winter	Spring	Summer	Fall
LCA Amdro® (10.0 g/m^2 spread)	√	√	√	√
LCA Amdro® (10.0 g/m^2 bait station)			√	√
Amdro® Ant Block (~10.0 g/m^2)	√	√	√	√
PTM™ (40 ml/hole)	√	√	√	√
Untreated colony (Check)	√	√	√	√

Efficacy of modified (LCA) and unmodified (AB) Amdro® and PTM™ Soil Injection for halting Texas leaf-cutting ant activity 16 weeks after colony treatment, East Texas, 2009.



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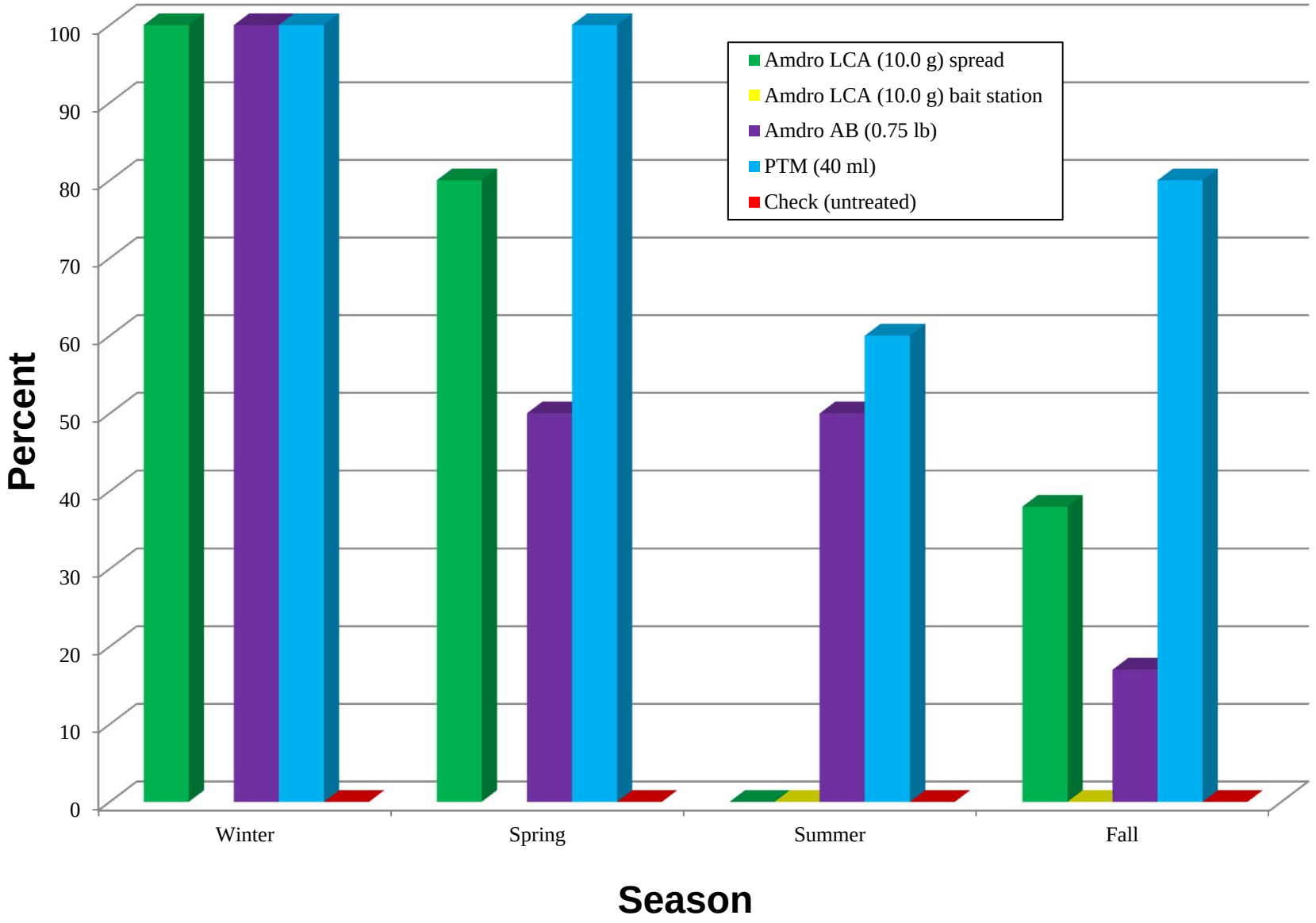


Status of LCA Control Options

- **EPA approved the addition of Texas leaf-cutting ants to the PTM™ Insecticide label in December 2009.**

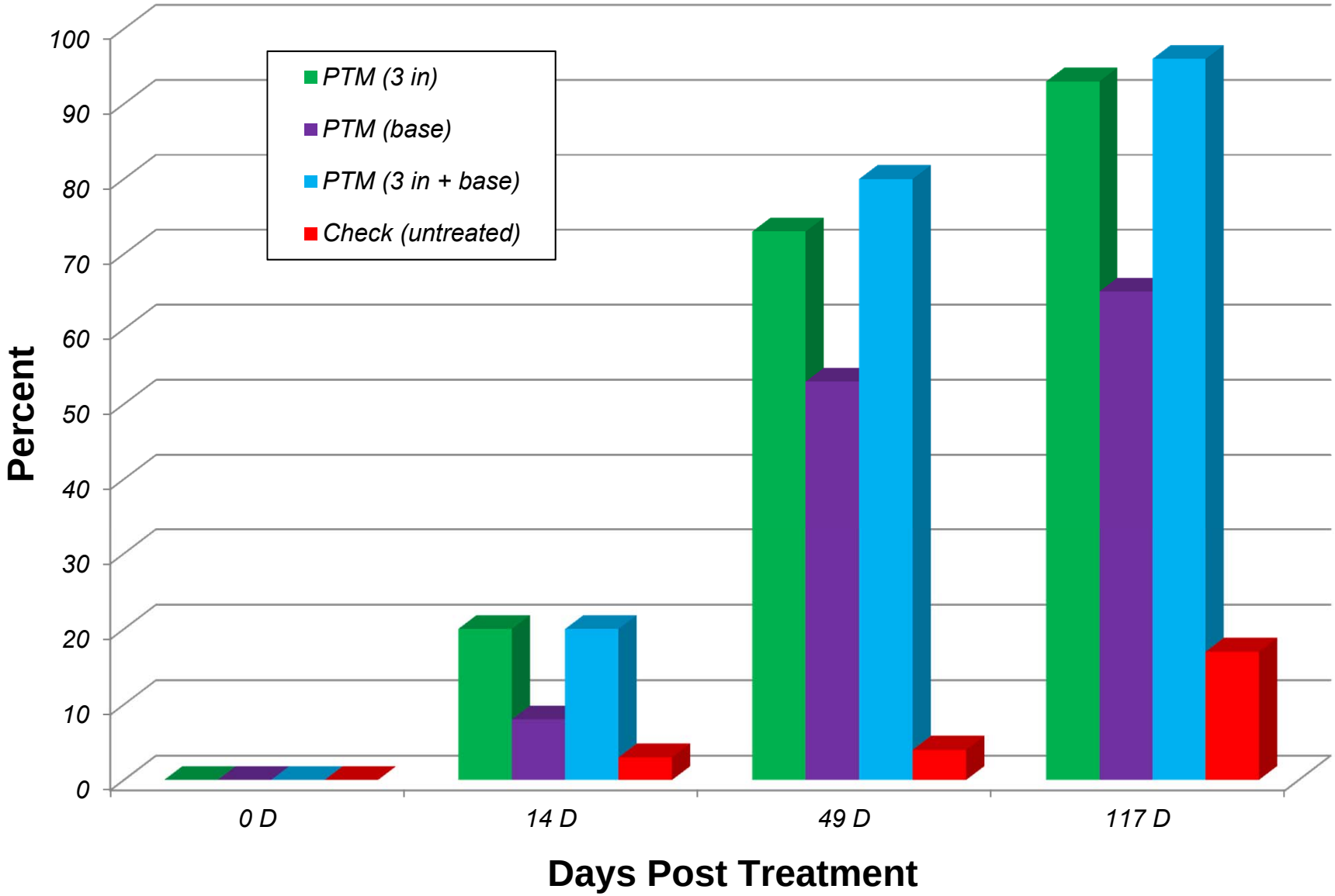
- **Efficacy of LCA bait is ~33% better than Ant Block. Central Garden and Pet initially was willing to submit for registration. Since no additional ingredients are added, the bait should be approved by EPA in short order and may be available by Summer 2011.**

Imported Fire Ant: 2009 & 2010

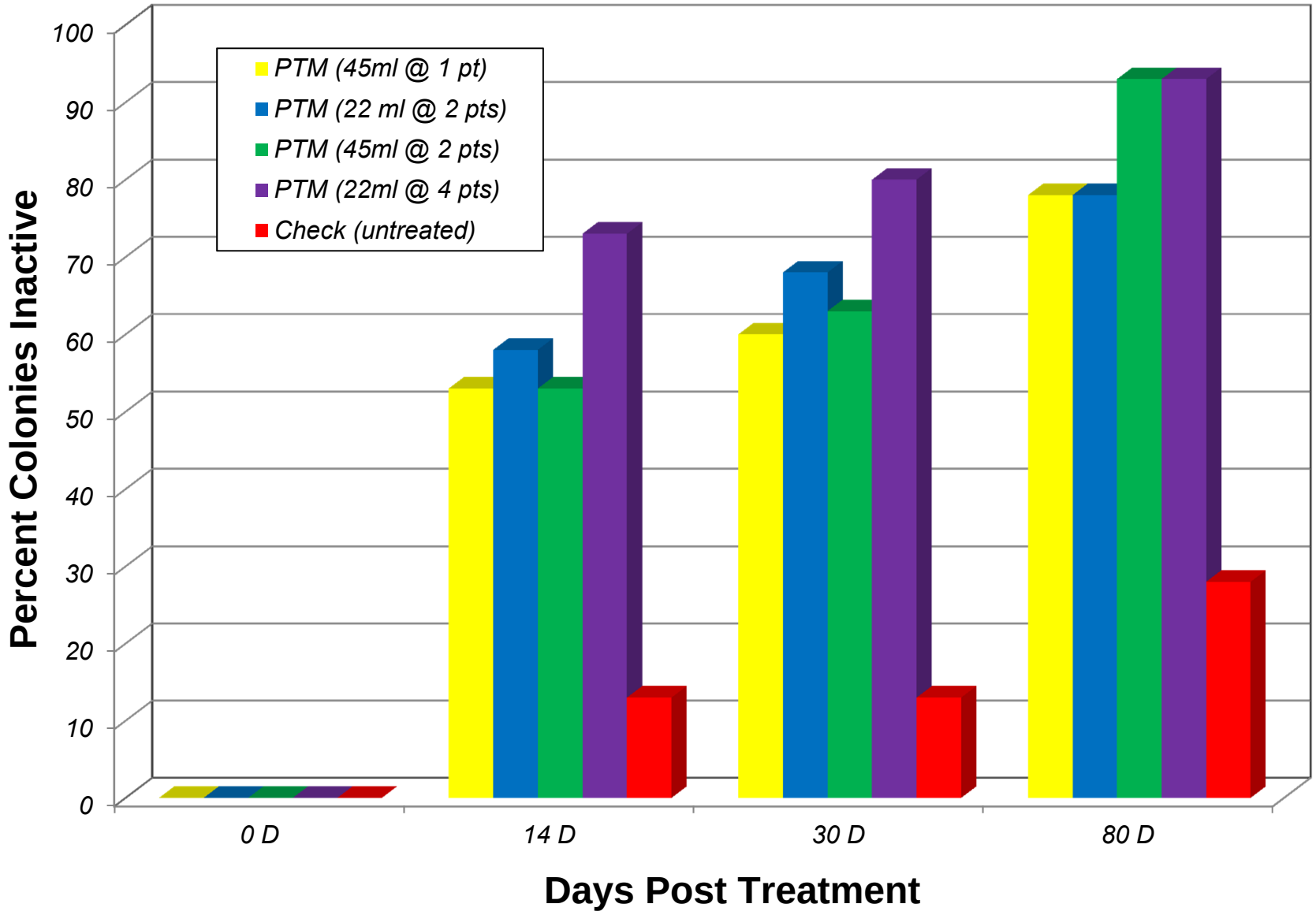
Objectives

- **Expand market for PTM™**
- **Evaluate and register PTM™ for control of the Imported fire ant.**

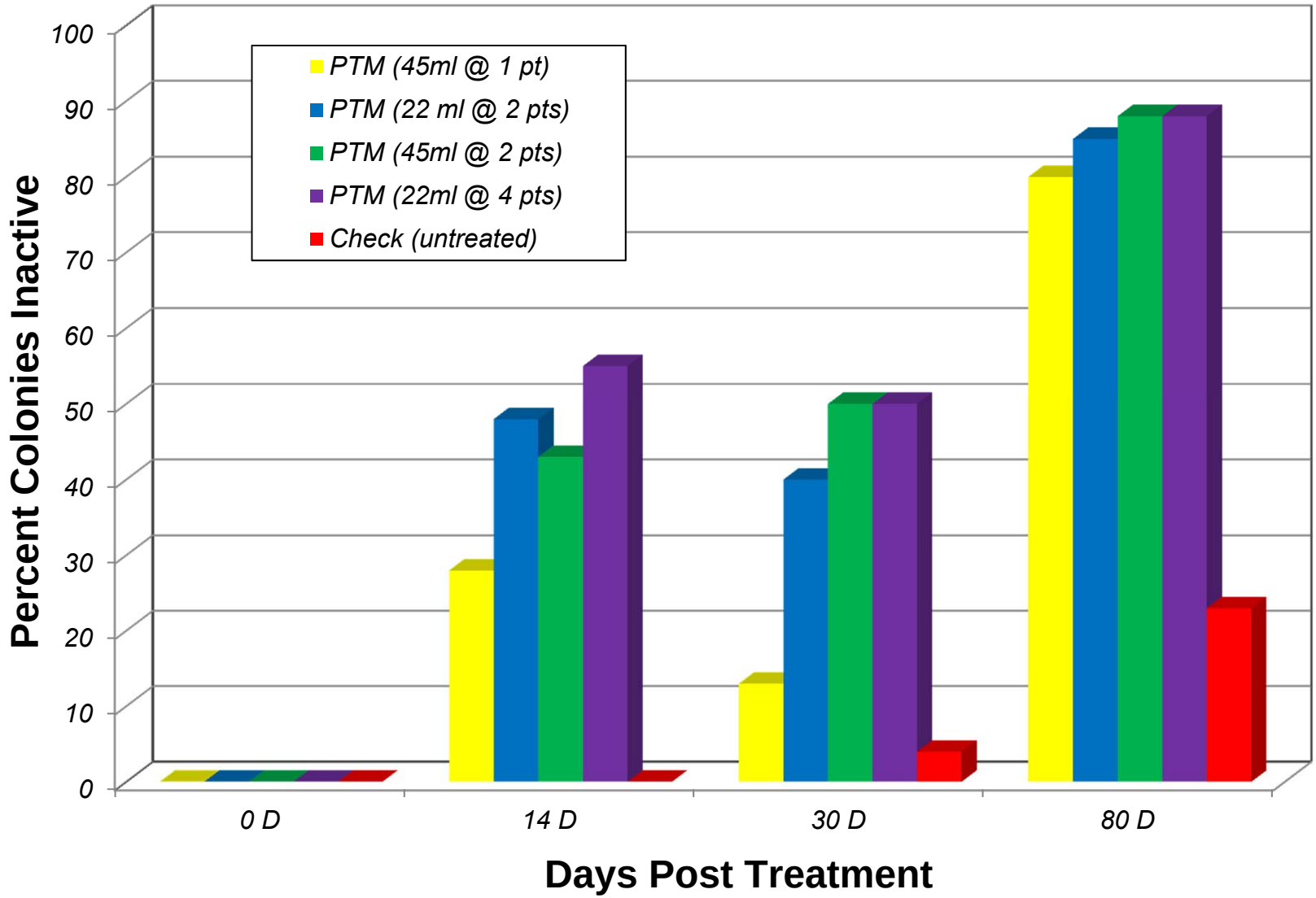
Efficacy of PTM™ Soil Injection for halting imported fire ant activity 16 weeks after colony treatment, East Texas, Winter 2009.



Efficacy of PTM™ Soil Injection for halting imported fire ant activity 11 weeks after colony treatment, East Texas, Spring 2010.



Efficacy of PTM™ Soil Injection for halting imported fire ant activity 11 weeks after colony treatment, Central Louisiana, Spring 2010.



Status of IFA Control Option

- **The efficacy of PTM averaged >90% for the three trials. BASF is willing to support the expansion of the label.**

- **BASF submitted a request to EPA in June for approval of the addition of red imported fire ants to the PTM™ Insecticide label. However, EPA has some issues that they are trying to resolve. EPA approval is <u>not</u> expected this year**

Proposed Research Efforts in 2011

- **Confirm efficacy of <u>new</u> modified Amdro® bait treatment against leaf-cutting ants in the late winter.**

- **Syngenta is asking if we would be interested in a field project looking at control options for leafcutter ants.**

Systemic Tree Injection

Research Efforts in 2010

Seed Orchard

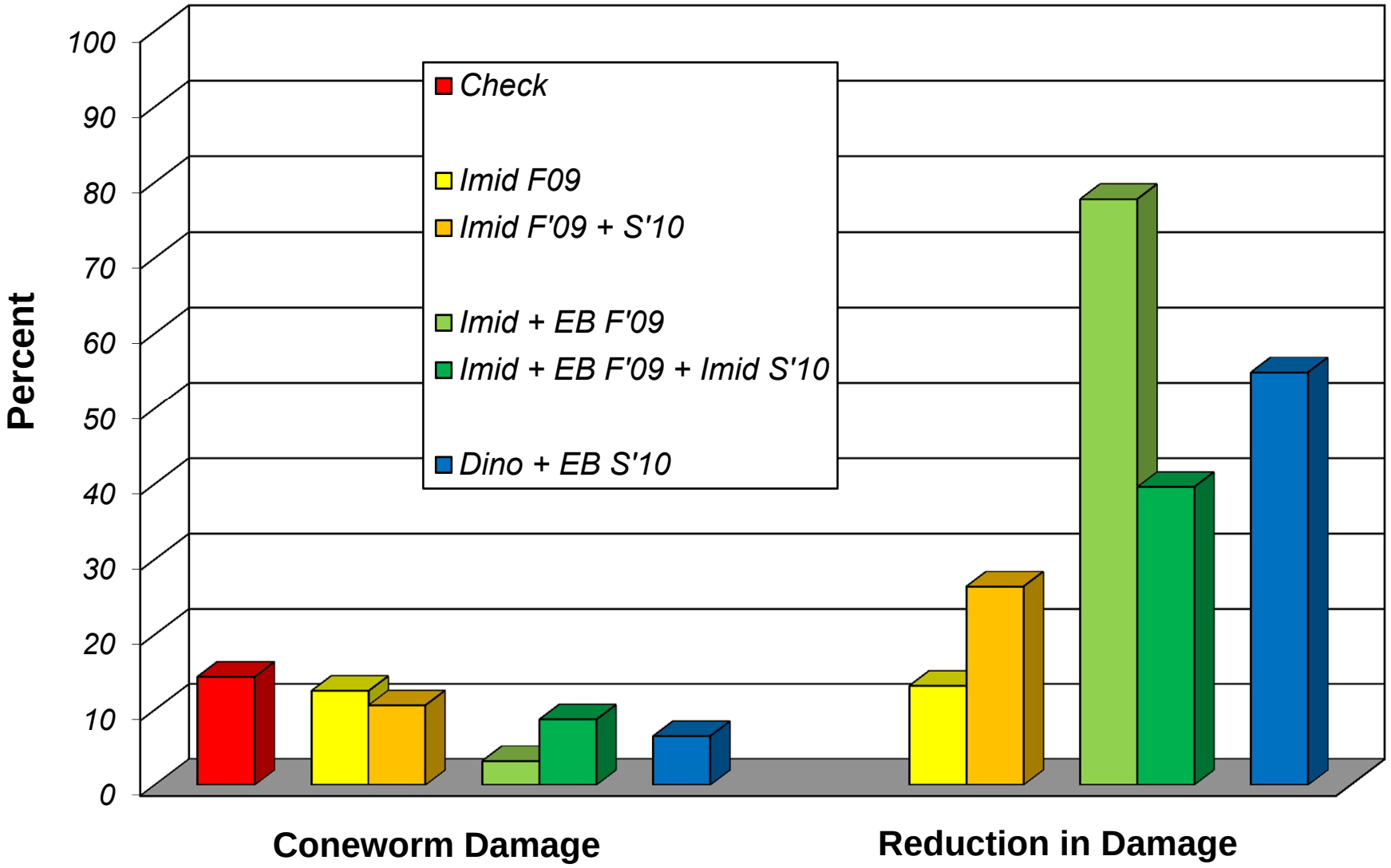
- **Objective – Continue to evaluate potential products for protection of seed crops against pine seed bugs.**

- **Inject seed orchard trees with several different systemic insecticides near Woodville, TX and Magnolia, AR.**

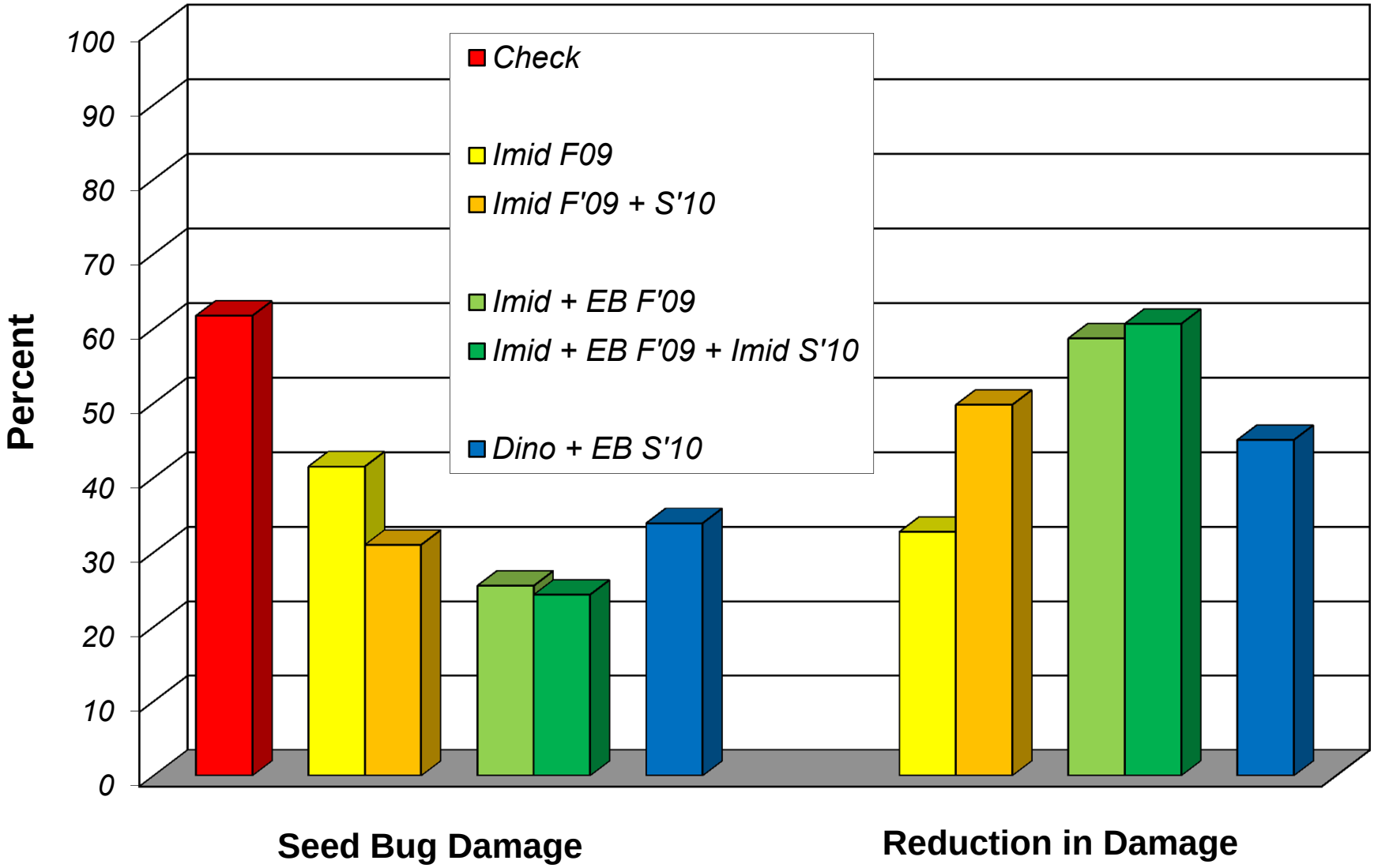
Magnolia, AR 2010

	Oct. 2009		Apr. 2010
• *Imidacloprid (Ima-jet®)*	*X*		
• *Imidacloprid*	*X*	*+ Imidacloprid*	*X*
• *Imidacloprid + EB*	*X*		
• *Imidacloprid + EB*	*X*	*+ Imidacloprid*	*X*
• *Dinotefuran + EB*			*X*
• *Check*			

Percent coneworm (*Dioryctria* spp.) damage and reduction in damage compared to check, Magnolia, AR 2010.



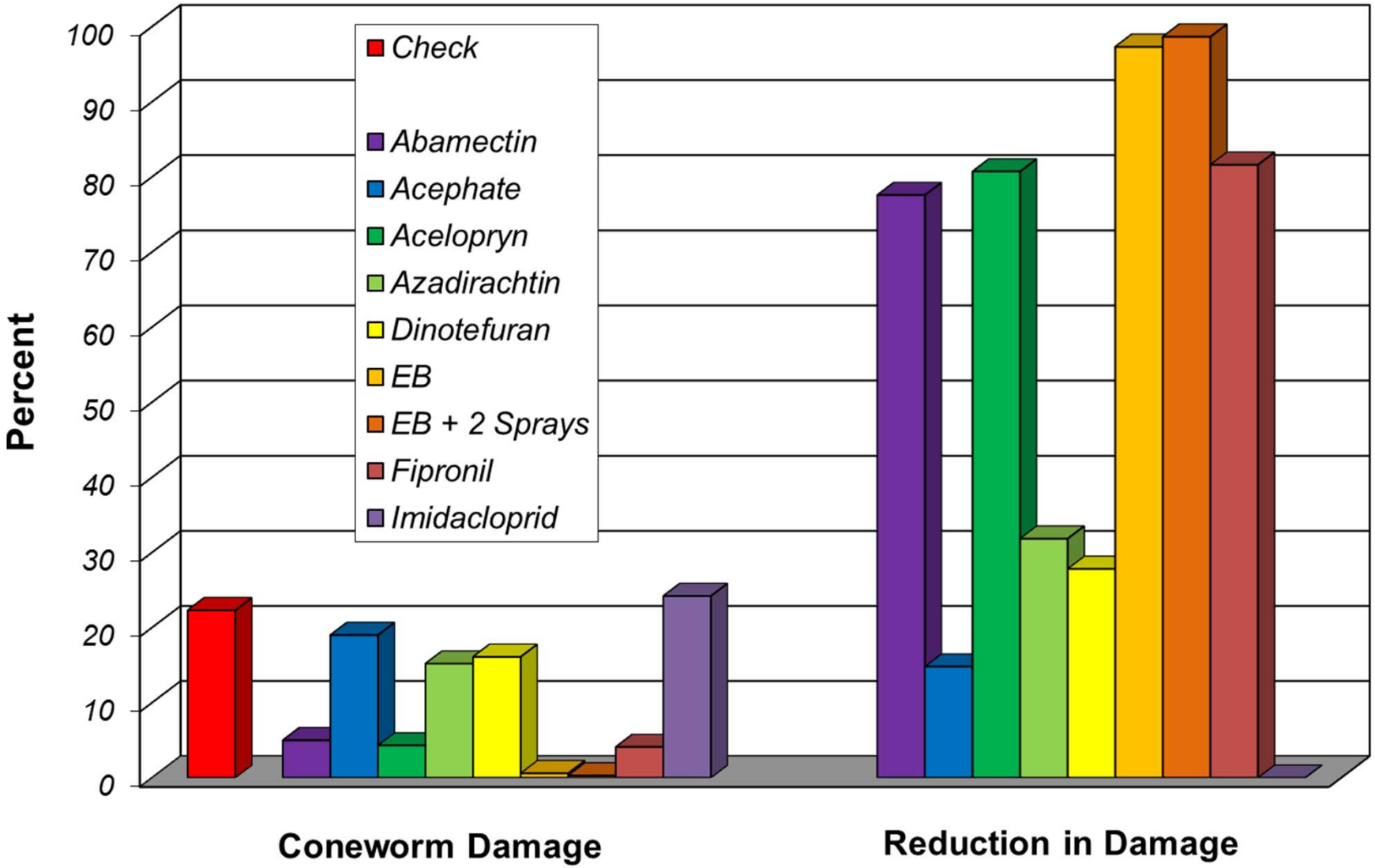
Percent seed bug (*Leptoglossus* and *Tetyra* sp.) damage to second year cones, Magnolia, AR 2010



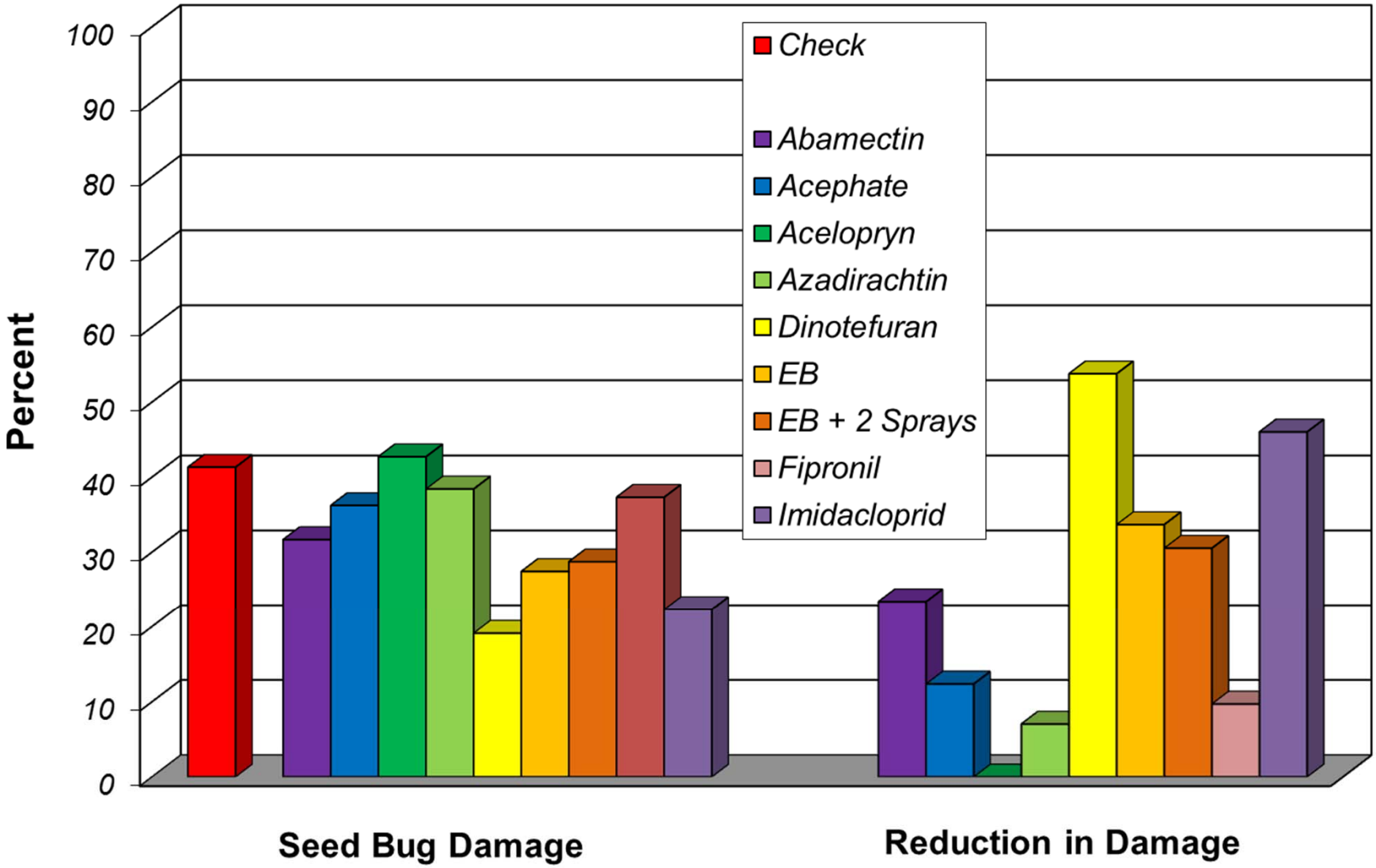
Woodville, TX 2010

	Oct. '09		Apr. '10	Aug. '10
• *Imidacloprid*	X			
• *Emamectin benzoate*	X			
• *Abamectin*	X			
• *Chlorantraniliprole*	X			
• *Fipronil*	X			
• *Azadiractin*	X			
• *Dinotefuran*			X	
• *Acephate*			X	
• *Emamectin benzoate*	X	*2 foliar sprays*	X	X
• *Check*				

Percent coneworm (*Dioryctria* spp.) damage and reduction in damage compared to check, Woodville, TX 2010.



Percent seed bug (*Leptoglossus* and *Tetyra* sp.) damage to second year cones, Woodville, TX 2010



Proposed Research Efforts in 2011 & 2012

- **Continue to monitor effects of single vs. double injections of imidacloprid applied in fall vs. spring at Weyerhaeuser's Magnolia SO, AR .**
- **Continue to monitor effects of six (6) different systemic insecticides for seed bug control at ArborGen's Woodville SO, TX .**
- **Evaluate injections alone or combined with sprays in 2012.**

Systemic Injection for Bark Beetles: 2004 - 2009

Objective

- **Evaluate and register alternative to bole sprays for protection of trees against bark beetles in seed orchards and residential sites.**

Research Efforts 2010

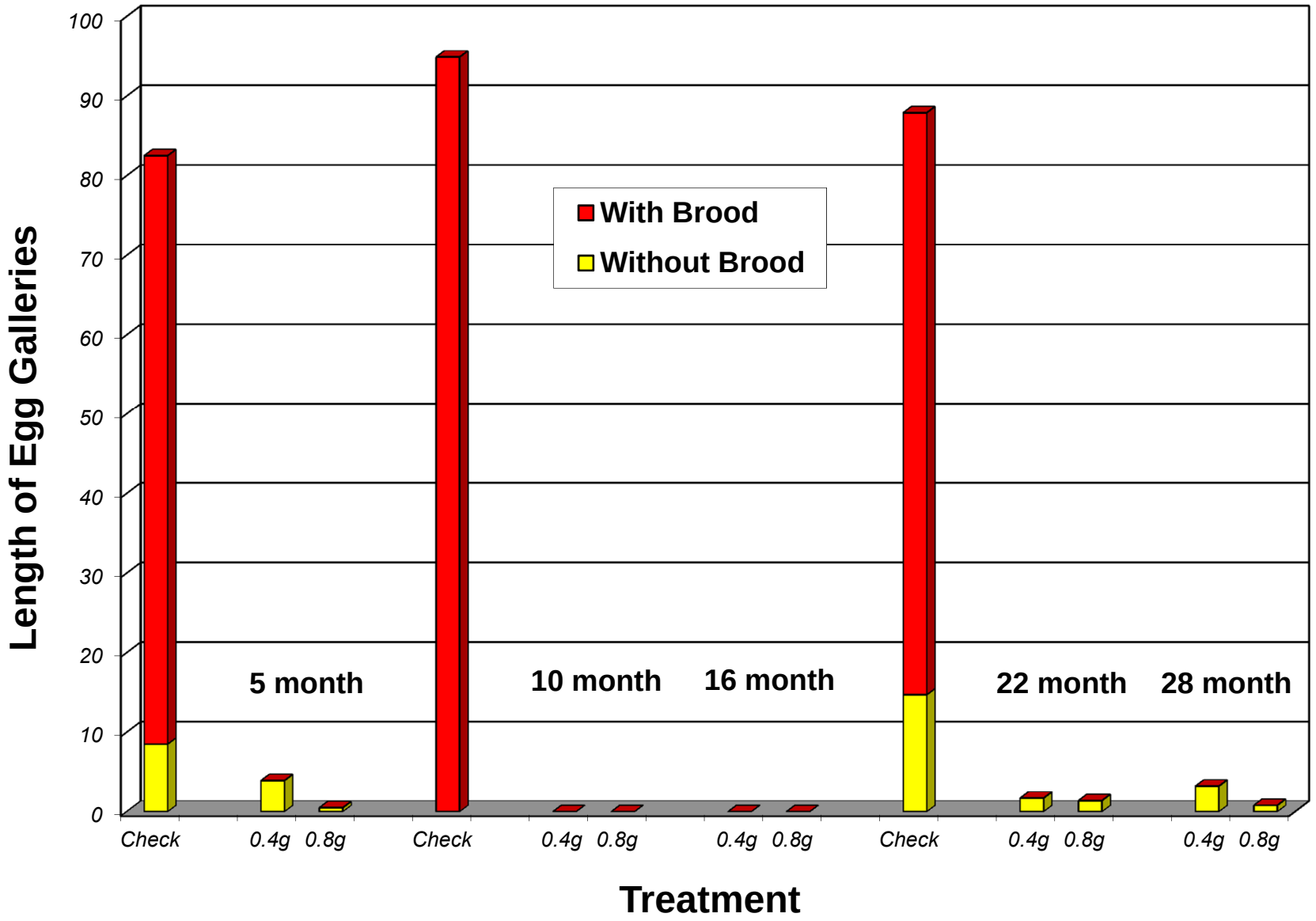
Ips & Dendroctonus Trials

- **Continue trial to evaluate efficacy of abamectin and fipronil at two rates against *Ips* in TX.**

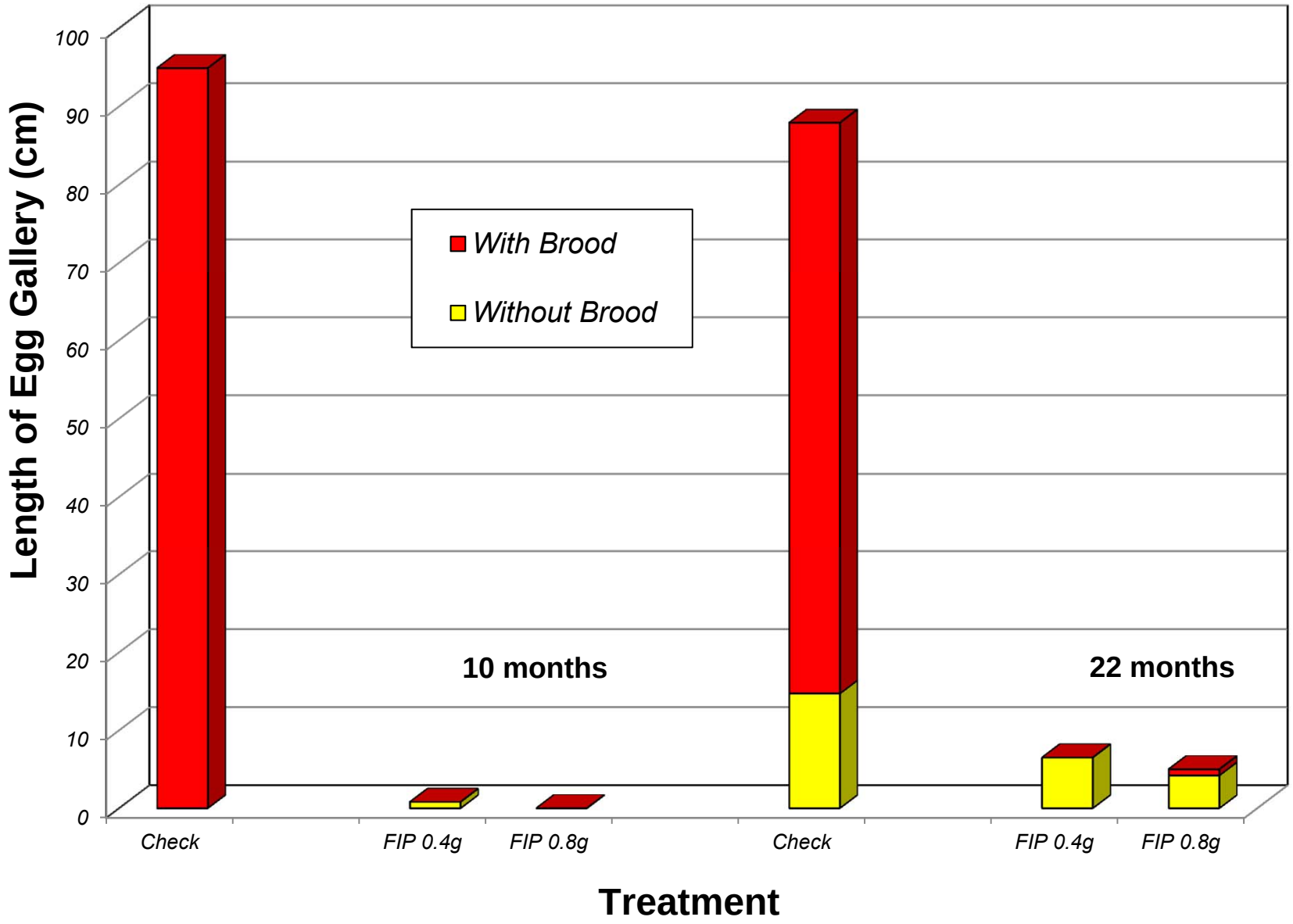
- **Continue evaluation of EB ± fungicide trials for:**

  1) SPB and blue stain fungi in Alabama.
  2) MPB and blue stain fungi in Utah.

Effects and duration of abamectin rates on *Ips* galleries length and brood development in loblolly pine logs : 2008 - 2010.



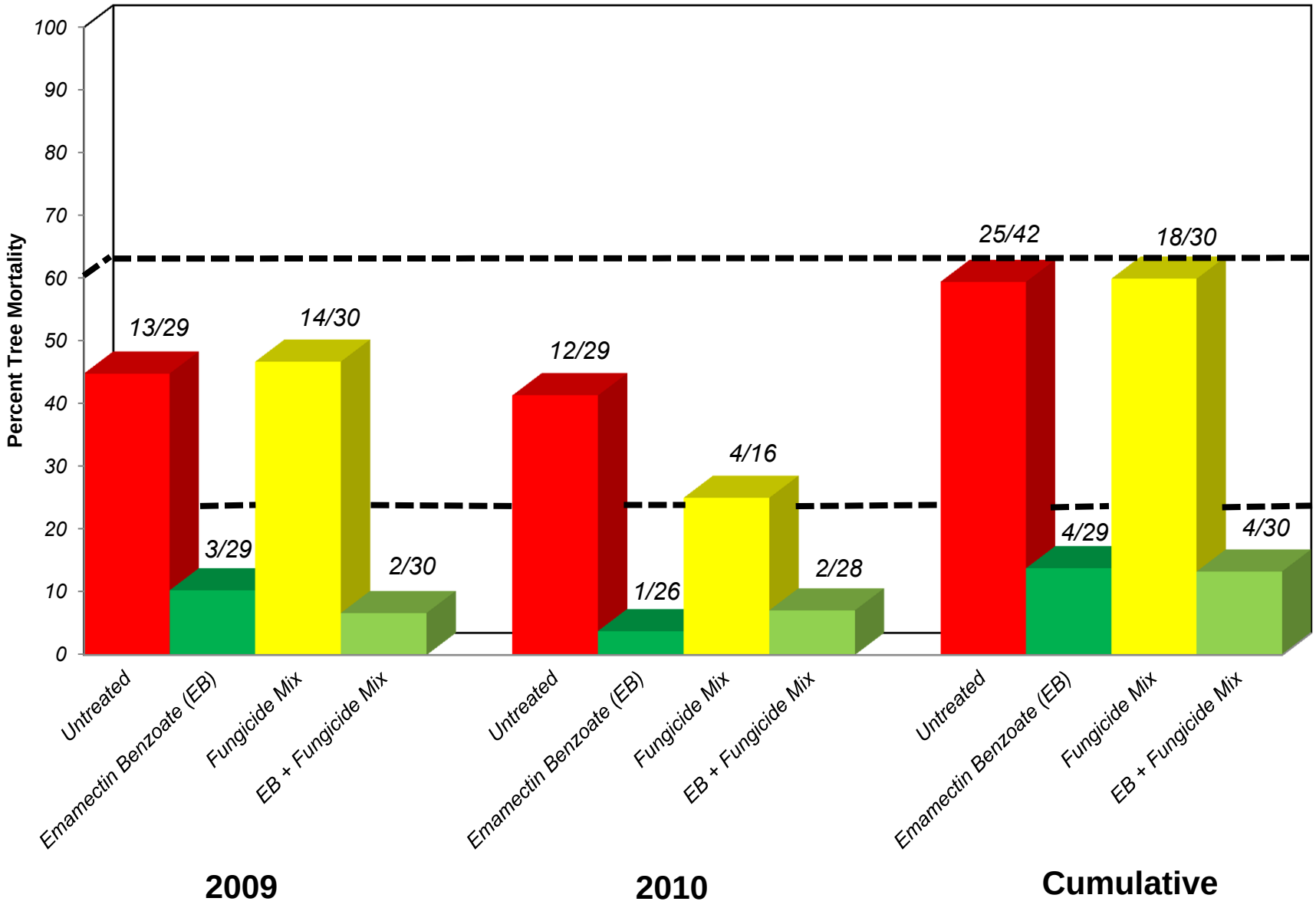
Effects and duration of fipronil rates on *Ips* galleries length and brood development in loblolly pine logs : 2009 - 2010.



SPB – Alabama 2009 - 2010

	Apr. 2009
• *Emamectin benzoate (EB)*	*X*
• *Propiconazole + Thiabendazole + (PT)*	*X*
• *EB + PT*	*X*
• *Check*	

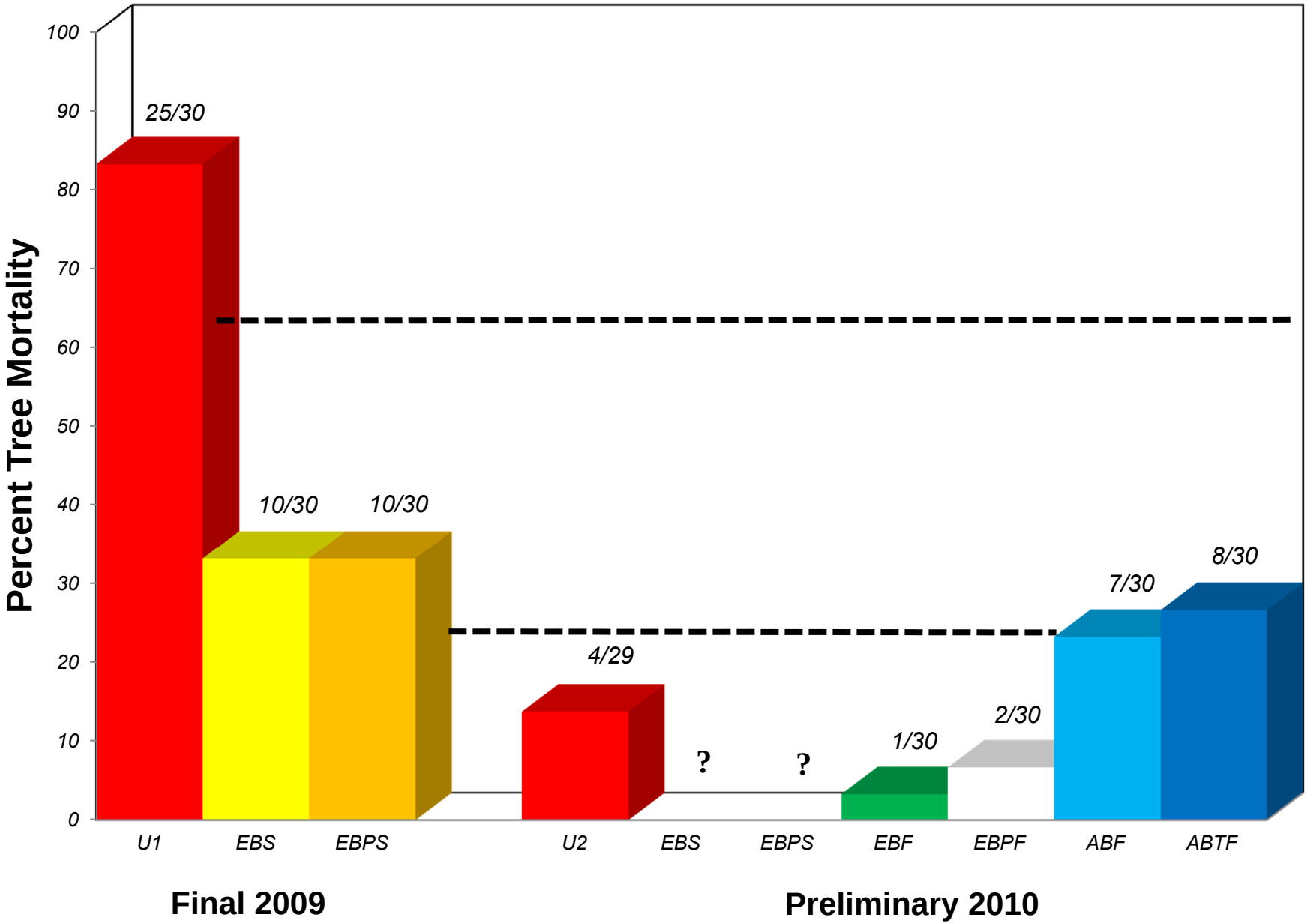
Effect of injection treatments on mortality of loblolly pine by southern pine beetle; Talladega N.F., Oakmulgee R.D., AL: 2009 - 2010



MPB – Utah 2009

	Jun. '09	*Sep. '09*
• *Emamectin benzoate (EB)*	*X*	
• *EB*		*X*
• *EB + Propiconazole (P)*	*X*	
• *EB + P*		*X*
• *Abamectin(Aba)*		*X*
• *Aba + Tebuconazole (Teb)*		*X*
• *Check*		

Effect of injection treatments on mortality of lodgepole pine by mountain pine beetle; Uinta-Wasatch-Cache N.F., UT: 2009 - 2010



Break Time!

Systemic Injection for Oak Pests: 2009

Objective

- **Evaluate emamectin benzoate (TREE-äge) for protection of oaks against potential pests, including wood borers and defoliators.**

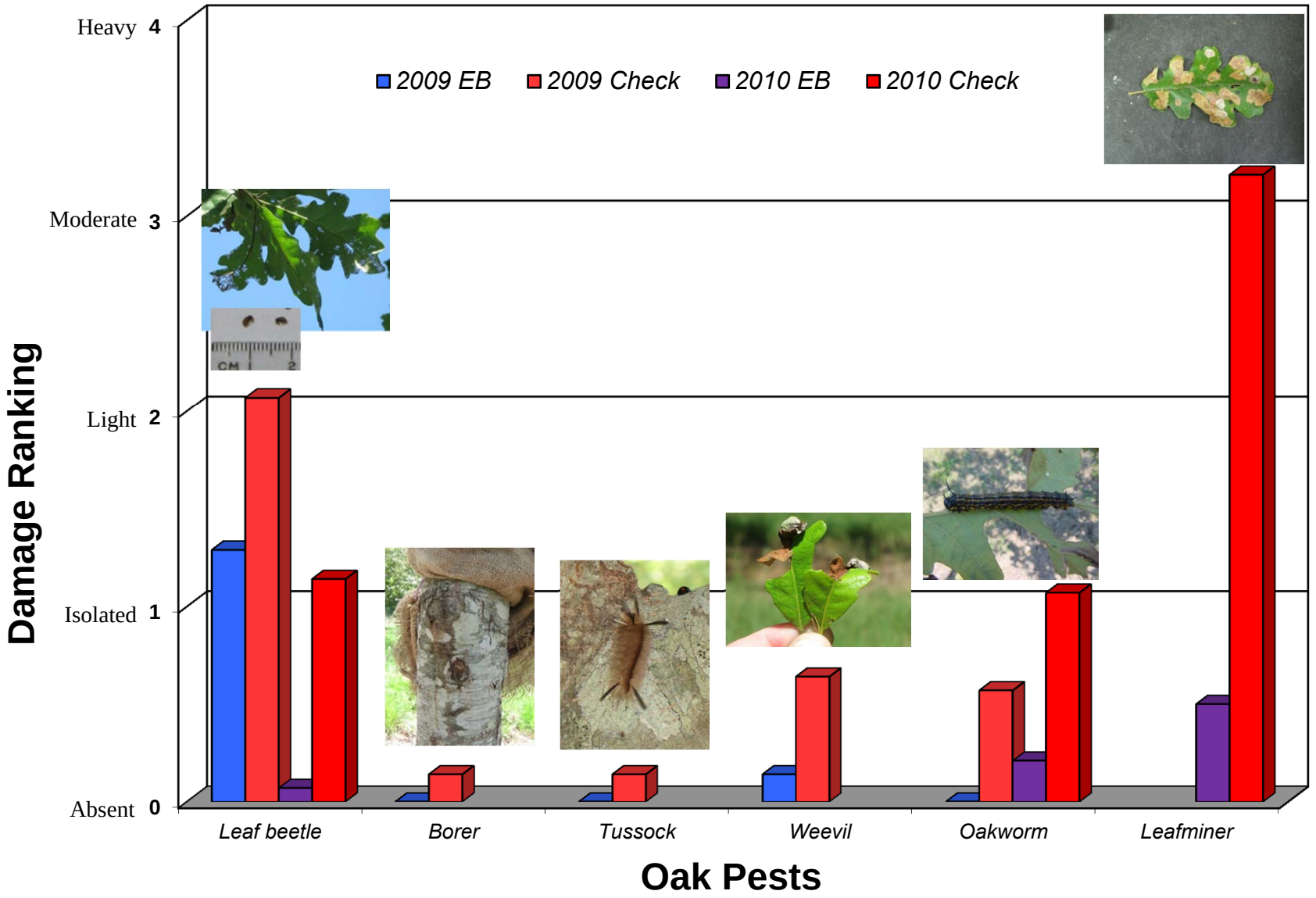
Research Efforts in 2009 & 2010

Oak Pest Trials

- **Injected cherrybark oak and bur oak with TREE-äge™ (EB) at Hudson Hardwood Orchard in April 2009.**

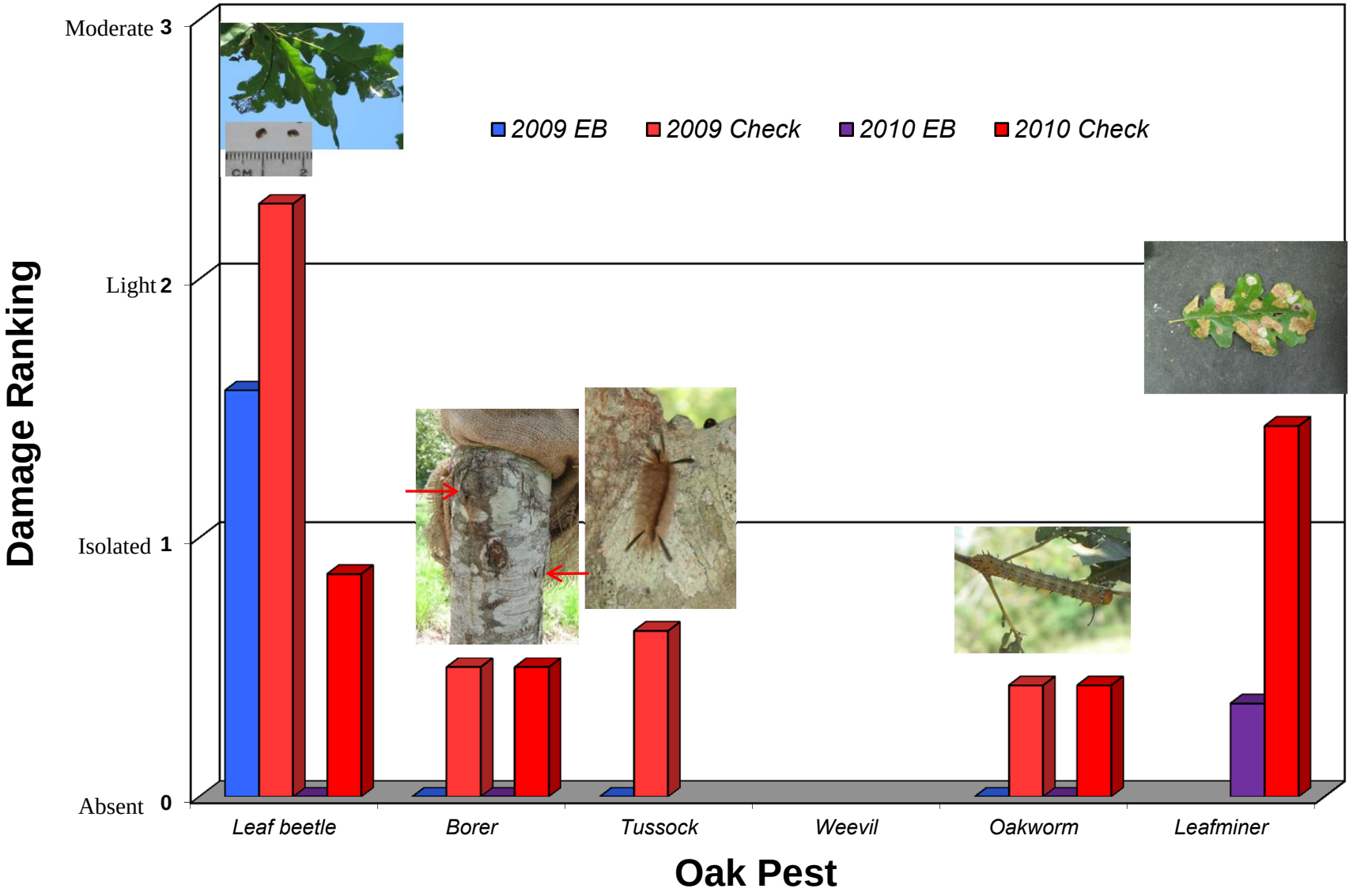
- **Visually monitor occurrence and severity of insects attacking cherrybark and bur oaks in 2009 and 2010.**

Effect of emamectin benzoate injection on occurrence of oak pests on bur oak; Hudson, TX 2009 & 2010



Damage Ranking: 0 = Absent; 1=Isolated; 2=Light; 3=Moderate; 4=Heavy; 5=Extensive

Effect of emamectin benzoate injection on occurrence of oak pests on cherrybark oak; Hudson, TX 2009 & 2010



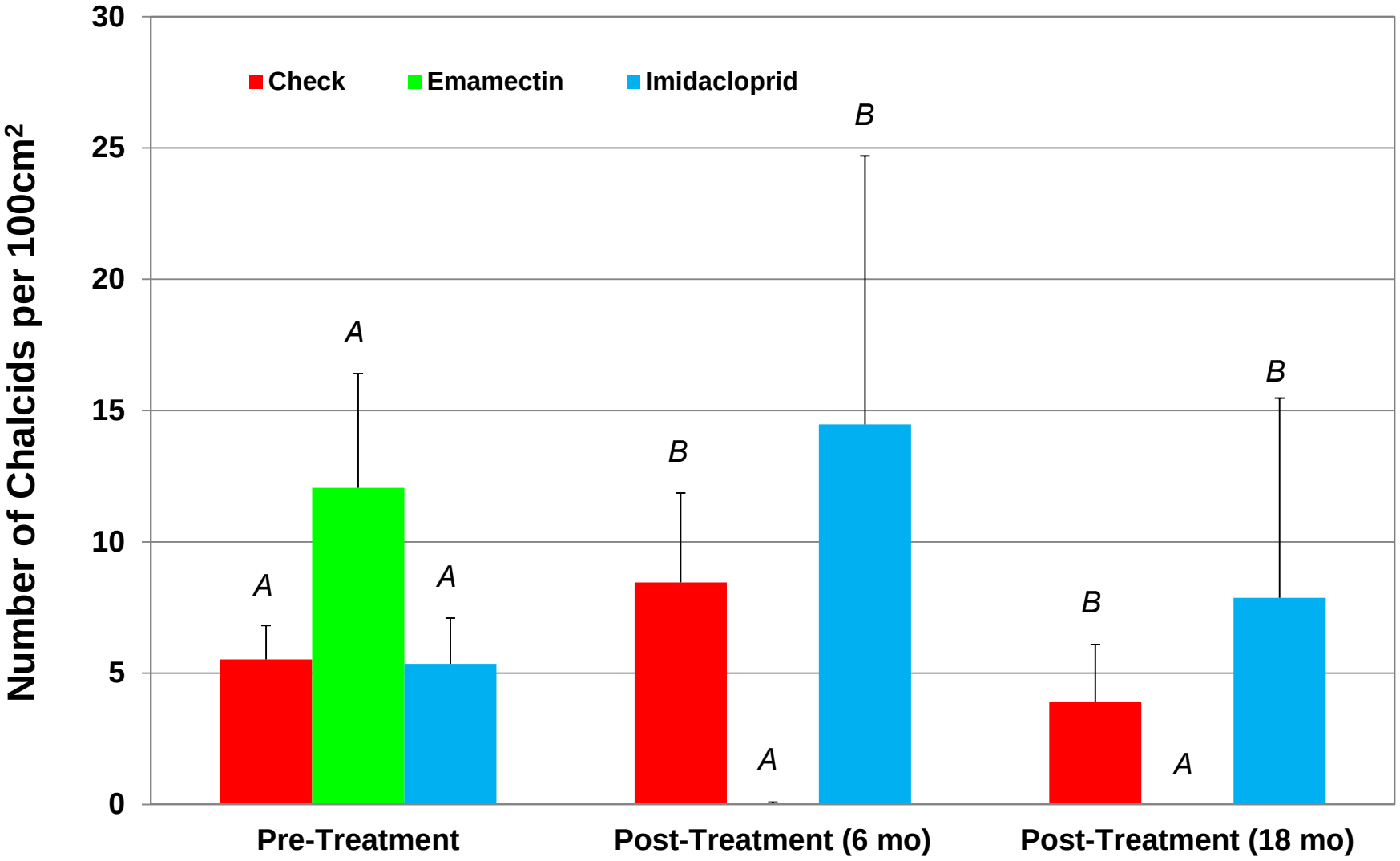
Damage Ranking: 0 = Absent; 1=Isolated; 2=Light; 3=Moderate; 4=Heavy; 5=Extensive

In the spring of 2008, Afghan pine in El Paso, TX was found to be dying. Deformed branches were observed. Chalcid (*Eurytoma* spp) adults and larvae were found in pits under the bark.

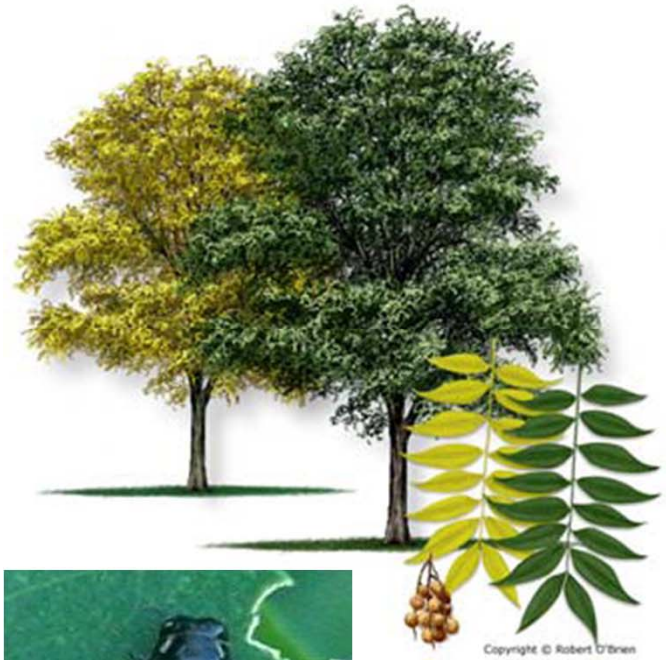
Control Trial

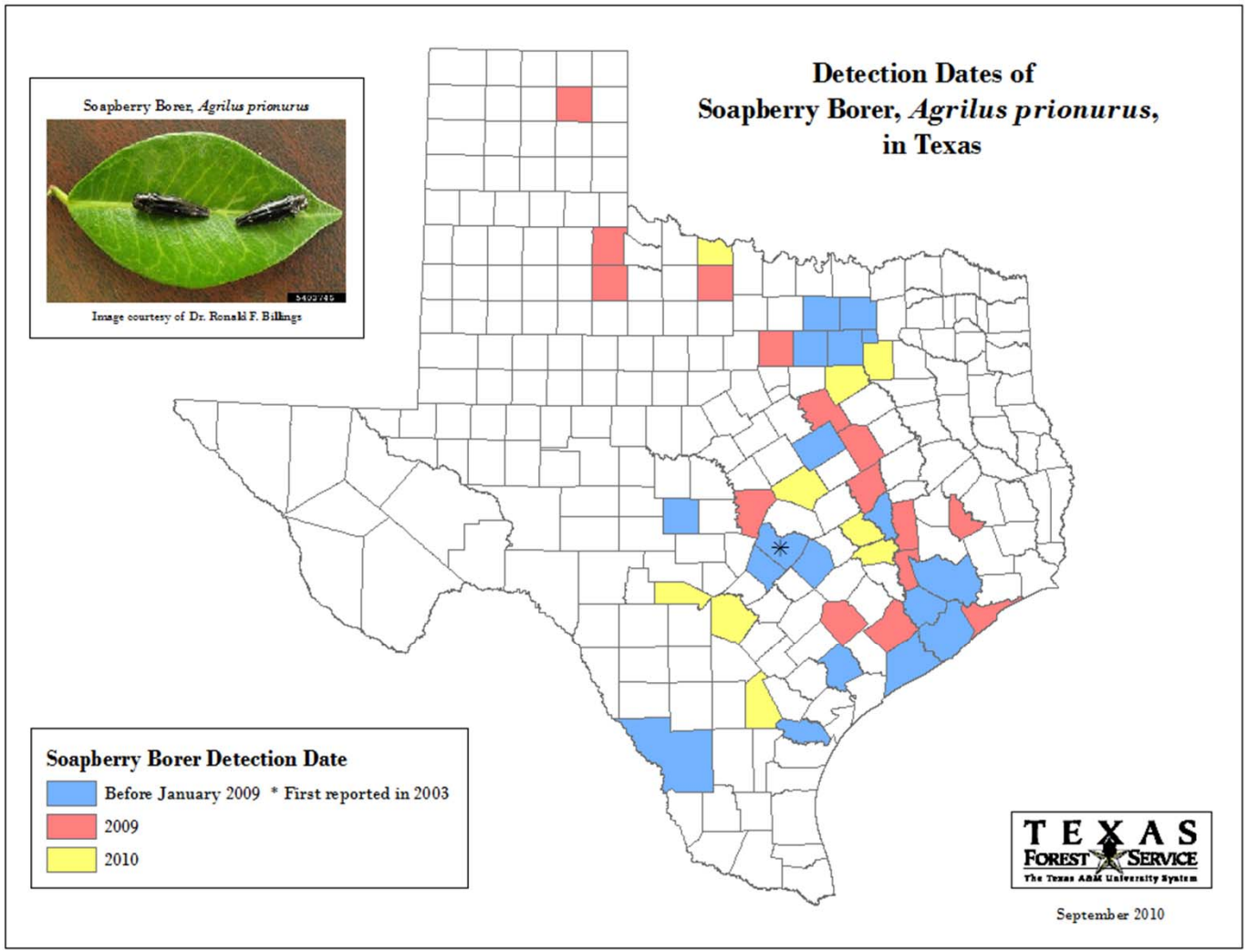
- **Fifteen trees were selected in El Paso and ten in Midland.**
- **Five trees were treated in El Paso with a Merit® (imidacloprid) soil injection in late December 2008.**
- **In early April 2009, five trees each (El Paso and Midland) were injected with emamectin benzoate (0.16g AI/cm DBH) using Arborjet's Tree IV (below right).**
- **Five trees were selected at each site and monitored as untreated controls.**

Pre- and Post-Treatment Occurrence of Chalcid Wasp on Afghan Pine Branches, El Paso, TX: 2009 & 2010



The soapberry borer (Agrilus prionurus), a native of Mexico, was first reported in Bastrop County, TX in 2003. Since then, it has been detected in seven additional counties, including the cities of Dallas, Austin, Houston and Corpus Christi,, and is causing extensive mortality of western soapberry.





Control Trial

- **Four to eight trees (2”–18” DBH) were selected in TX near Richmond (S of Houston), Allen (NE of Dallas) and Mesquite (E of Dallas).**

- **In early June and July 2009, these trees were injected with emamectin benzoate (0.16g AI/cm DBH) using Arborjet’s Quik-jet (below right) or Tree IV.**

- **An equal number of trees were selected at each site and monitored as untreated controls.**

Untreated Soapberry

Moderate to heavy epicormic branching

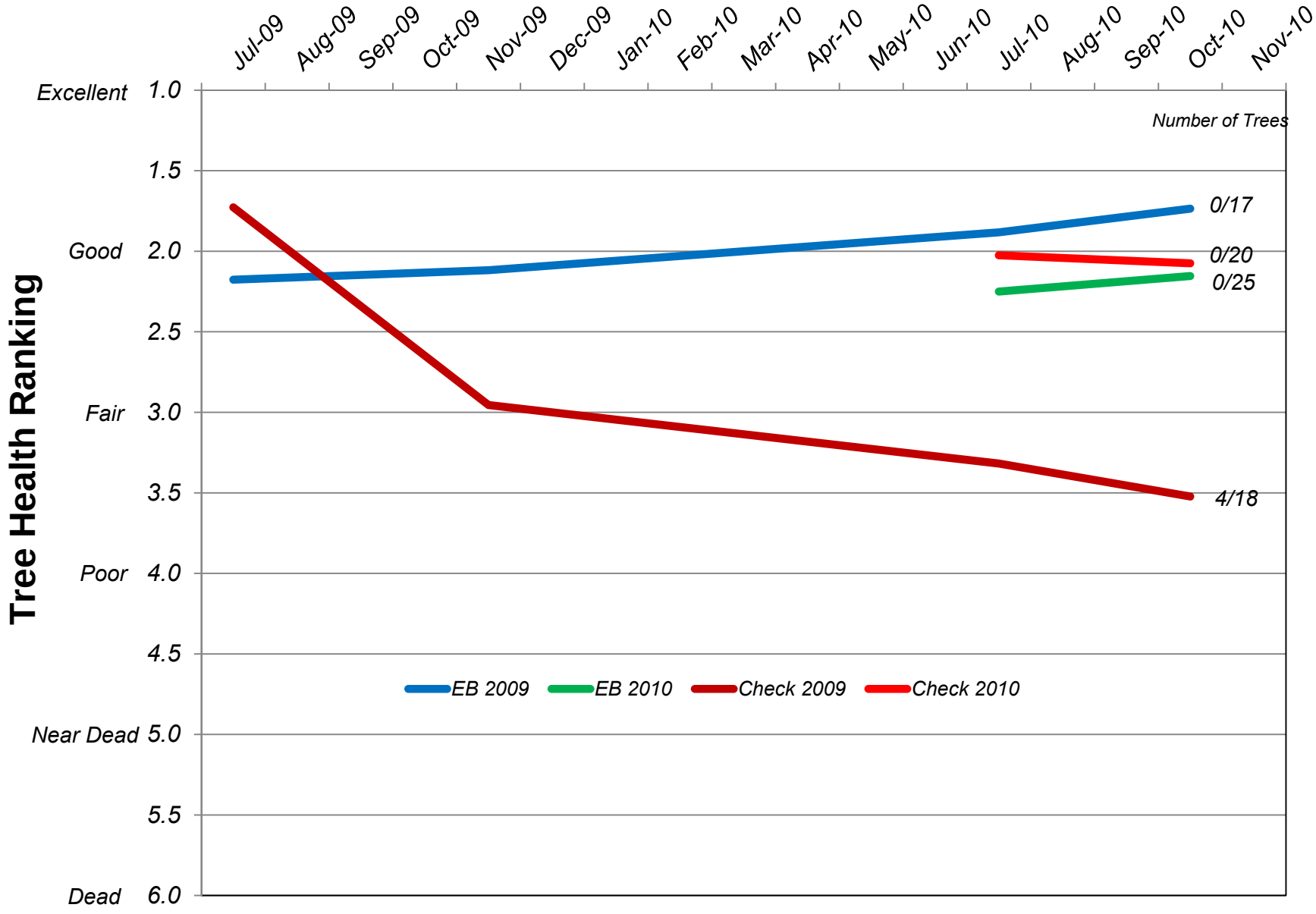
Larger trees had flaking bark and emergence holes.

EB-Treated Soapberry

Healing wounds

Little or no epicormic branching

Effects of EB treatments on health of western soapberry in central Texas, 2009 & 2010.



Status of Product Registration

- **EPA approved the full registration (Section 3) of emamectin benzoate (TREE-äge™) use on ash against emerald ash borer in July 2009. In December 2010, EPA approved additional uses - " for control of mature and immature arthropod pests of deciduous, coniferous and palm trees, including, but not limited to, those growing in residential and commercial landscapes, parks, plantations, seed orchards, and forested sites (in private, municipal, state, tribal and national areas)."**

- **Abamectin and fipronil have also shown very good efficacy against Ips engraver beetles. Mauget will likely add bark beetles and pine coneworm to their Abicide 2 lable.**

Research Efforts in 2011

- Continue to monitor effects of abamectin and fipronil against *Ips* engraver beetles in TX.
- Continue to monitor effects of EB and fungicides against SPB (AL) and MPB (UT).
- Continue to monitor effects of EB against oak pests.
- Continue to monitor invasive trials.
- Evaluate Azasol (azadirachtin) and Safari (diniteferon) for ability to protect pines against Ips engraver beetles
- Evaluate microinjection systems for ability to apply Alamo (propiconazole) for protection of live oaks against oak wilt disease.

Injection System Evaluation

Chemjet

Pine Infuser

Portle

Macroinjection

Mauget

Tree IV

Regeneration Weevils

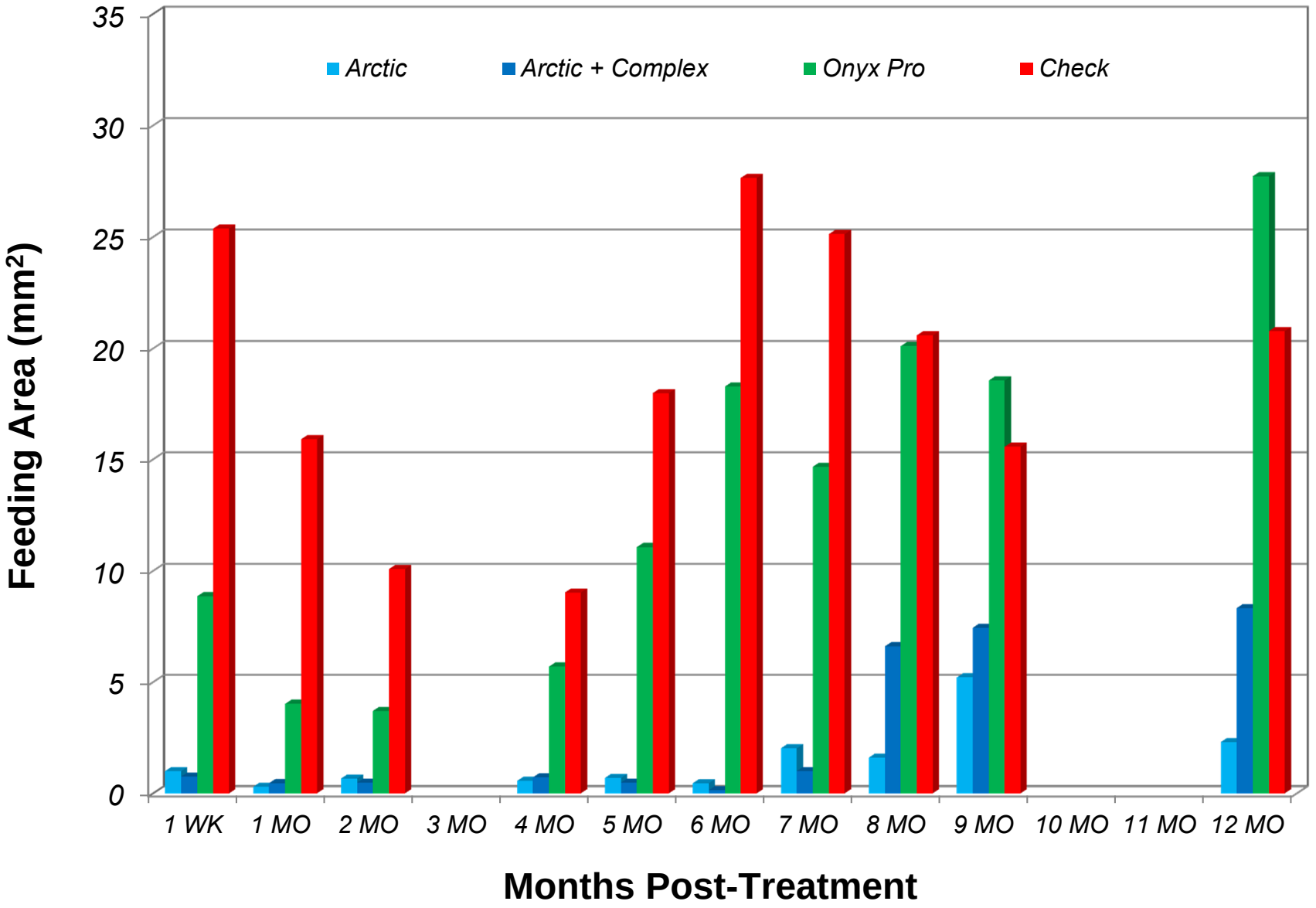
Regeneration Weevils: 2009 & 2010

Objectives

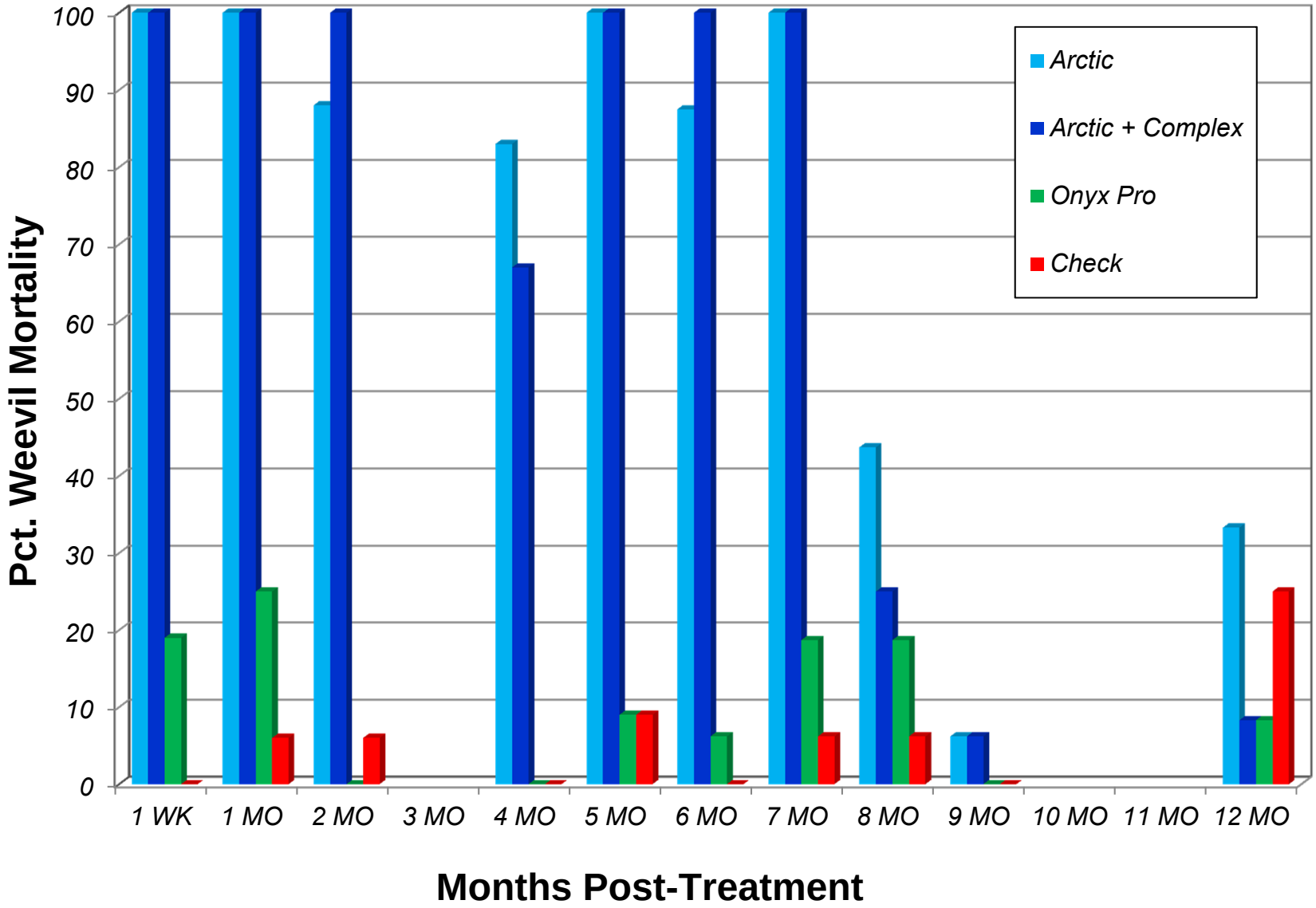
- **Determine the efficacy of Arctic™ (permethrin) alone or combined with spreader/sticker and OnyxPro™ (bifenthrin) in reducing weevil-caused weevil mortality.**

- **Determine longevity of Arctic™ and OnyxPro™ residuals on treated pine seedlings.**

Feeding area by pales weevil after exposure to Arctic™ and OnyxPro™-treated pine seedlings.



Mortality of pales weevil after exposure to Arctic™ and OnyxPro™-treated pine seedlings.



Tip Moth Control

Status of PTM™ Registration

- EPA approved Section 3 (Full) registration of PTM™ Insecticide in June 2007 for application during or post-planting of seedlings.
- C3M, Helena, ProSource, Red River Specialty and UAP are current distributors.
- Red River Specialty is selling PTM™ at $325 per gallon; can purchase in 20 oz ($55) and 2.5 gal containers ($812).
- Can only apply 21 oz of product per acre (chemical cost per acre is $53.32).
- No restriction on number of seedlings that can be treated. However, the lower the density – the higher the concentration per seedling.

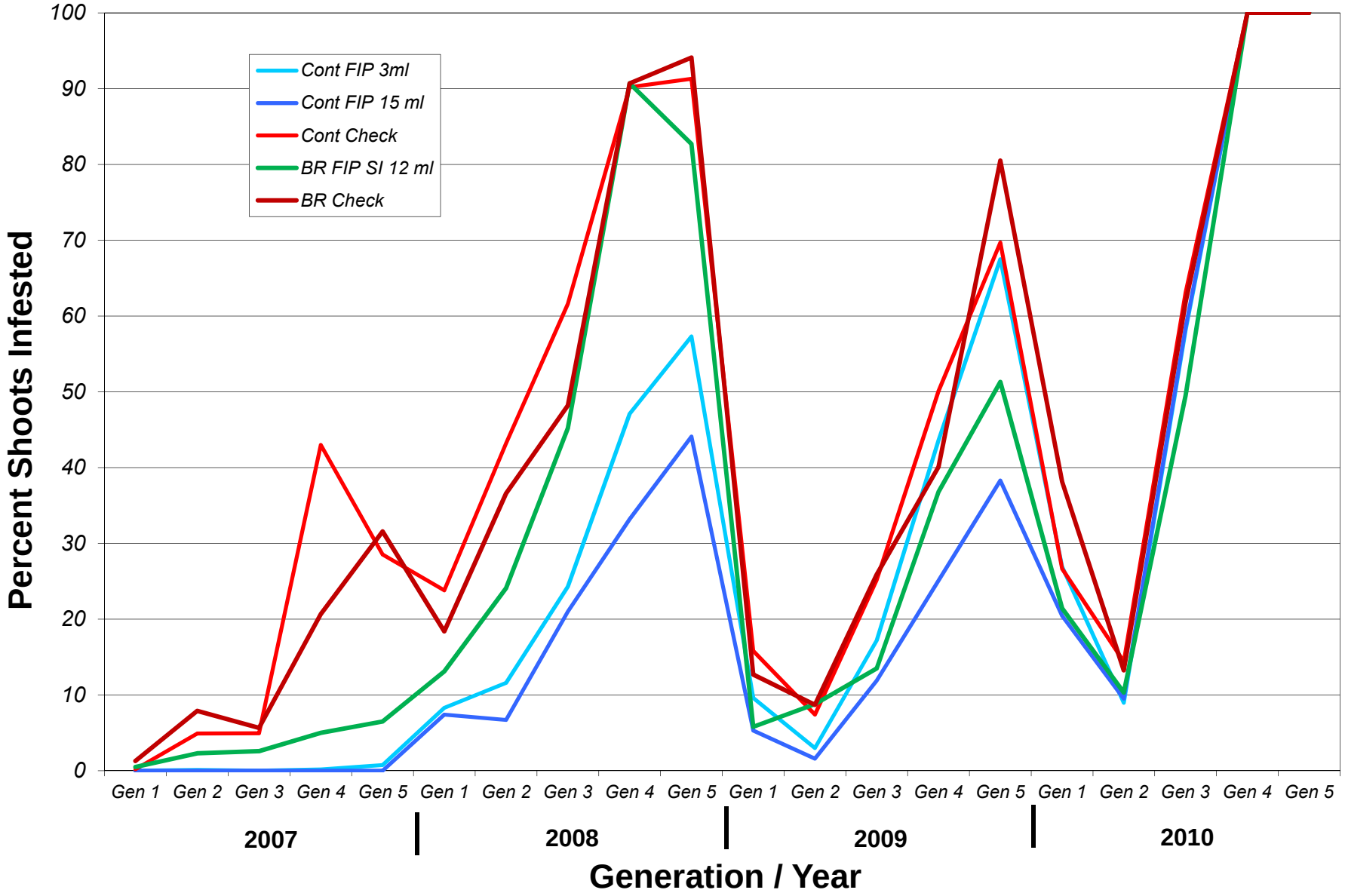
Q1: What is the best treatment rate, depth, placement and volume?
Q2: Is it effective when applied one year after planting?

Research Efforts in 2009 & 2010

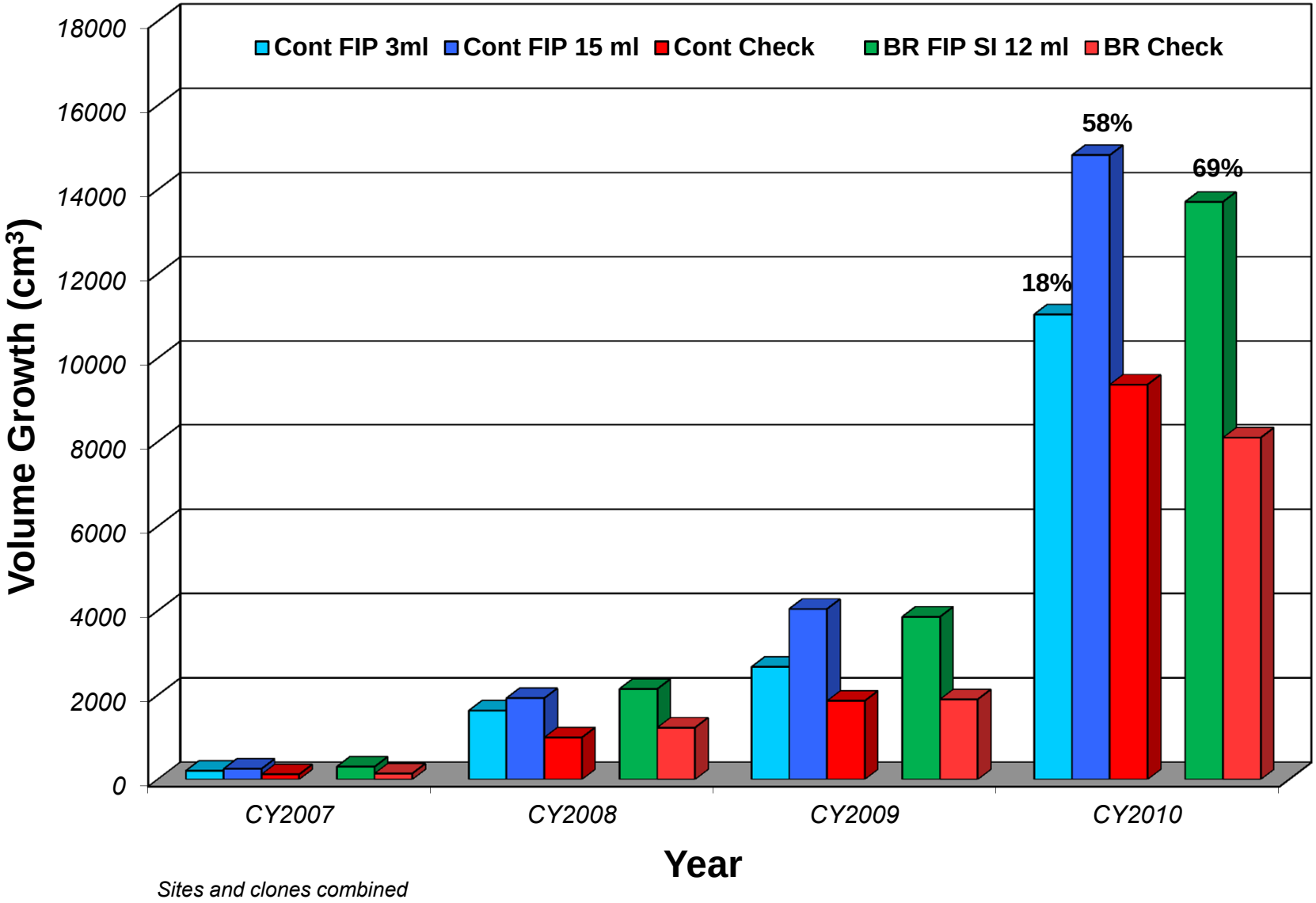
- **Continue to evaluate efficacy of PTM™ applied to containerized seedlings.**

- **Continue to evaluate efficacy of PTM™ applied one year after planting at different rates, placement, volume.**

Effects of fipronil soil treatment on infestation of containerized and bareroot loblolly pine by pine tip moth on 2 sites: 2007 - 2010



Effects of fipronil soil treatment on volume (cm^3) growth of containerized and bareroot loblolly pine on 2 sites: 2007 - 2010



Sites and clones combined

Unprotected

End of Year 1

End of Year 2

Mid-Year 4

Container 3ml Q clone

Container 15ml Q clone

Container Check Q clone

Bareroot Soil Inj Q clone

Bareroot Check Q clone

Conclusions

- **PTM™ placed in plant hole or containers works best and for the longest duration (3+ years).**
- **PTM™ applied after planting is best placed shallow (4 inches deep) and at higher volumes (30 ml). Still, duration is reduced (< 2 years) compared to plant hole treatments.**
- **Operational treatments have been inconsistent. Work need to improved machine planter system.**
- **Application of PTM into containers in the nursery could reduce application costs.**
- **BASF is now willing to extend PTM™ registration for use on containerized seedlings if EPA concerns are addressed.**

EPA Concerns

- **<u>Leaching of Active Ingredient (AI)</u>:**
  Application of PTM into cells early in the growing season and subsequent watering will result in leaching of some (1-3%) AI out of cells – up to 3 lbs AI / acre.

- **<u>Worker Exposure</u>:**
  Seedling packers and planters usually hold seedlings at the plug. Workers will be exposed to AI present on the surface of the plug.

PTM™ Applicators

PTM™ Spot Gun

Kioritz Soil Injector

Production Discontinued

PTM™ Injection Probe

2008

Day System - TX

Machine Planters Fitted with Soil Injection Systems

2011

Dowden System - LA

PTM™ for Containerized Seedlings - 2010

	PI	*SI*	*Cont.*	*Bareroot*
• PTM (Hi UD)	X		X	
• PTM (Hi D)		X	X	
• PTM (Hi D)		X		X
• PTM (Med. UD)	X		X	
• PTM (Med. D)	X		X	
• PTM (Med. D)		X	X	
• PTM (Med. D)		X		X
• PTM (Low UD)	X		X	
• PTM (Low D)	X		X	
• PTM (Low D)		X	X	
• PTM (Low D)		X		X
• Check (Cont)			X	
• Check (BR)				X

Plug Injection Trial – Site Distribution - 2011

Status of SilvaShield™ Registration

- **SilvaShield™ Forestry Tablet was registered with EPA in December 2006. It is now registered in all states, except CA.**
- **Helena, UAP and Red River Specialties are distributors.**
- **Red River Specialty is selling the ball tablet at ~$0.21 a piece ($250 per bag of 1200). The label restricts the number of tablets applied per acre to 450. This equates to $93.75 per acre.**

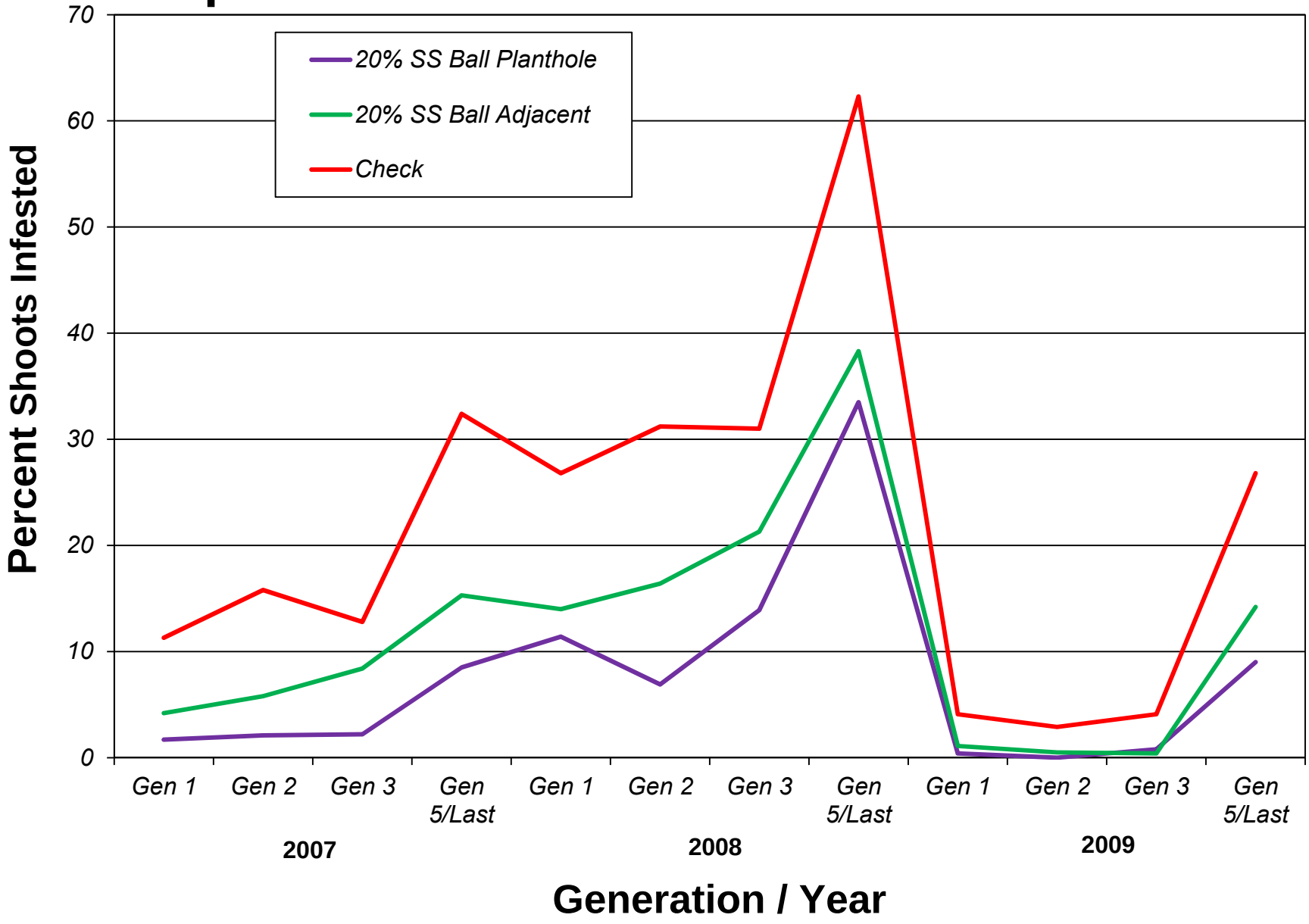
Q1: What is the best treatment rate, depth, placement and timing?

Q2: Is it effective when applied one year after planting?

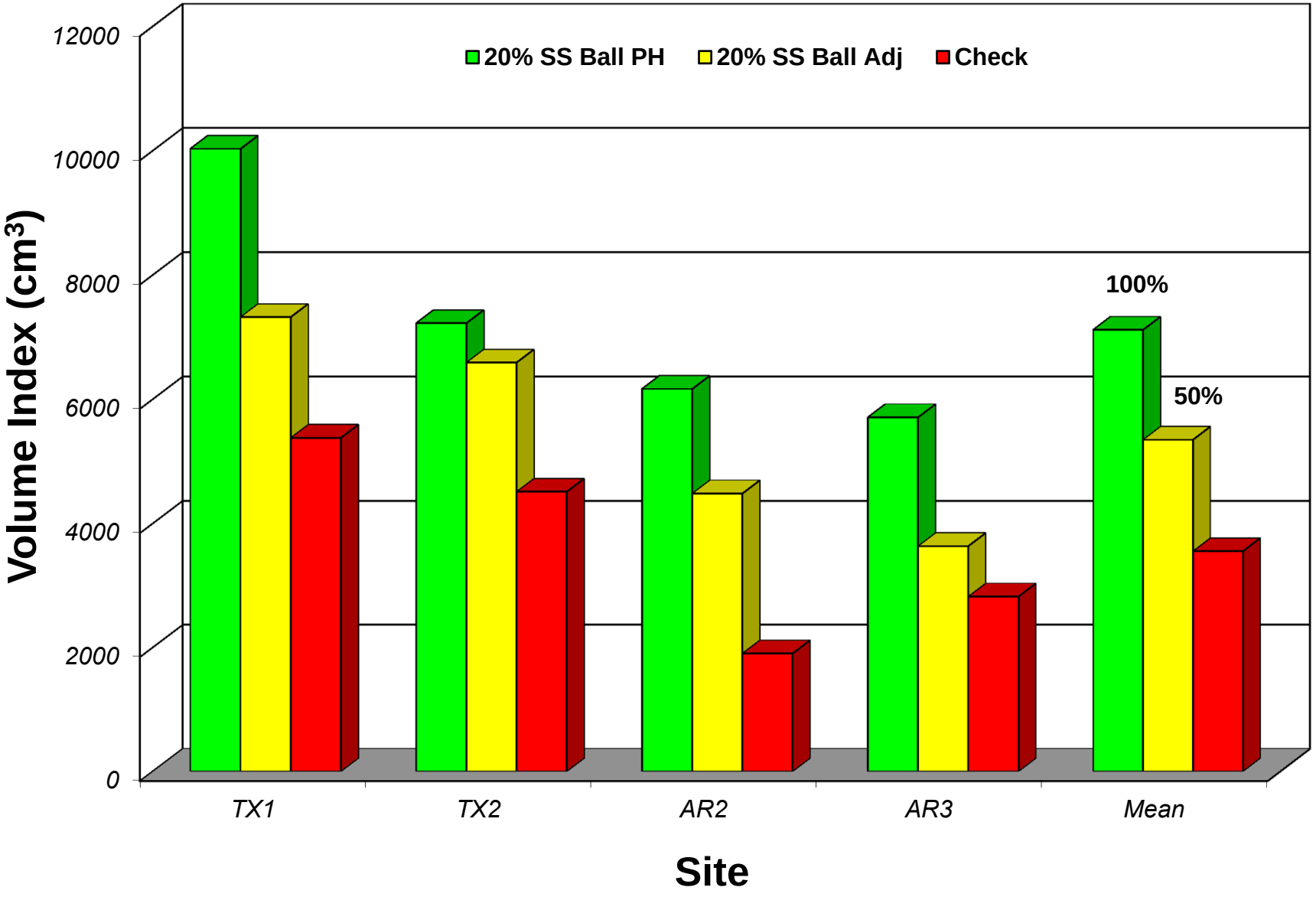
Research Efforts in 2010

- Continue to monitor growth effects of SilvaShield™ tablet against pine tip moth on 4 sites (2 in AR and 2 in TX).
- Continue to monitor efficacy of SilvaShield™ applied at different rates (# of tablets) and depths for control of pine tip moth.
- Continue to evaluate efficacy of SilvaShield™ in reducing area-wide pine tip moth damage.
- Initiated trial to compare effects of SilvaShield™ alone and combined with fertilizer and/or weed control.

Effect of SilvaShield™ tablets and placement on tip moth infestation – 5 sites: 2007 - 2009



Effect of SilvaShield™ tablets and placement on volume growth (cm^3) – 4 sites: 2010



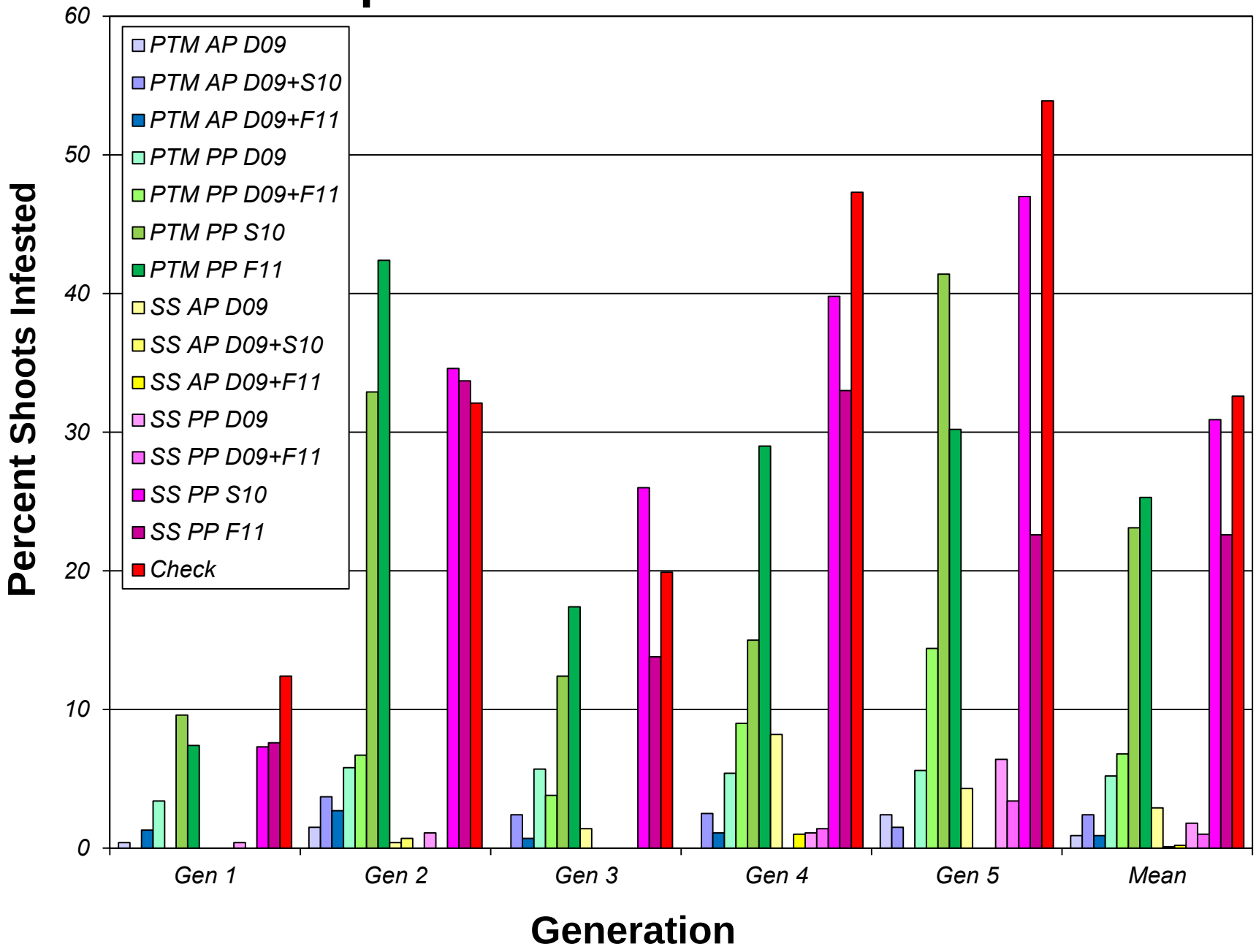
Conclusions

- **SilvaShield™ Forestry Tablets can significantly reduce tip moth damage through the 3rd year after planting.**
- **Tablets placed in plant hole are more effective compared to those placed adjacent to seedling.**
- **Higher rates most effective for longest duration. Depth of tablet placement had no apparent affect.**
- **Tablets reduced tip moth damage and improved growth. Weed control and fertilization did not.**
- **Operational tablet treatments have been more effective and consistent compared to PTM™. Work is need to develop applicator system.**

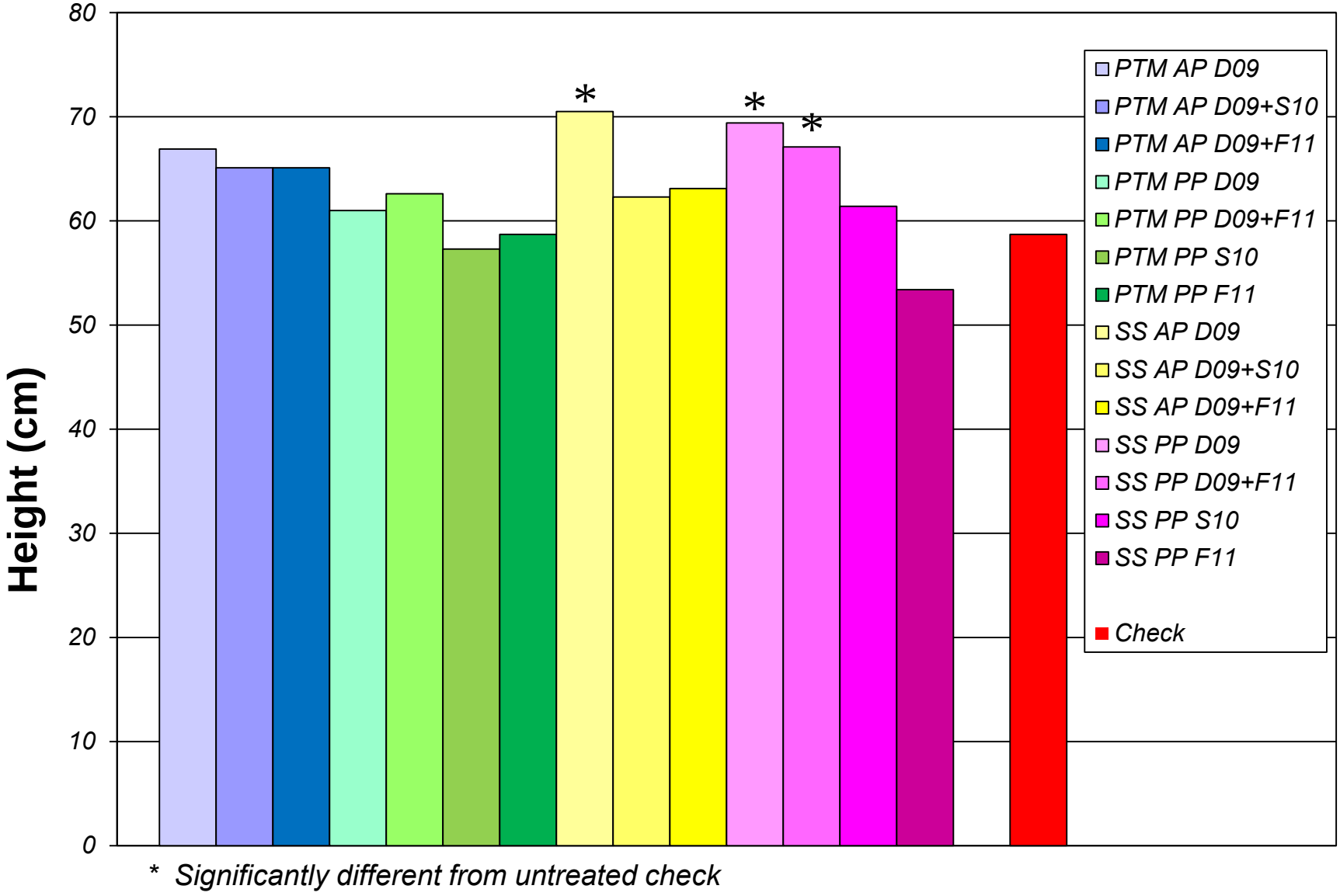
PTM™/SilvaShield™ Comparison - 2010

	AP	*PP*	*Dec.'09*	*Sep.'10*	*Feb.'11*
PTM	X		X		
PTM		X	X		
PTM		X		X	
PTM	X	X	X	X	
PTM		X			X
PTM	X				X
PTM		X	X		X
PTM	X		X		
SilvaShield	X		X		
SilvaShield		X	X		
SilvaShield		X		X	
SilvaShield	X	X	X	X	
SilvaShield		X			X
SilvaShield	X	X	X		X
SilvaShield		X	X		X
Check					

Effect of PTM and SilvaShield™ and timing on tip moth infestation: 2010



Mean height (cm) of one-year old PTM™- and SilvaSheild™-treated and untreated loblolly pine: 2010.



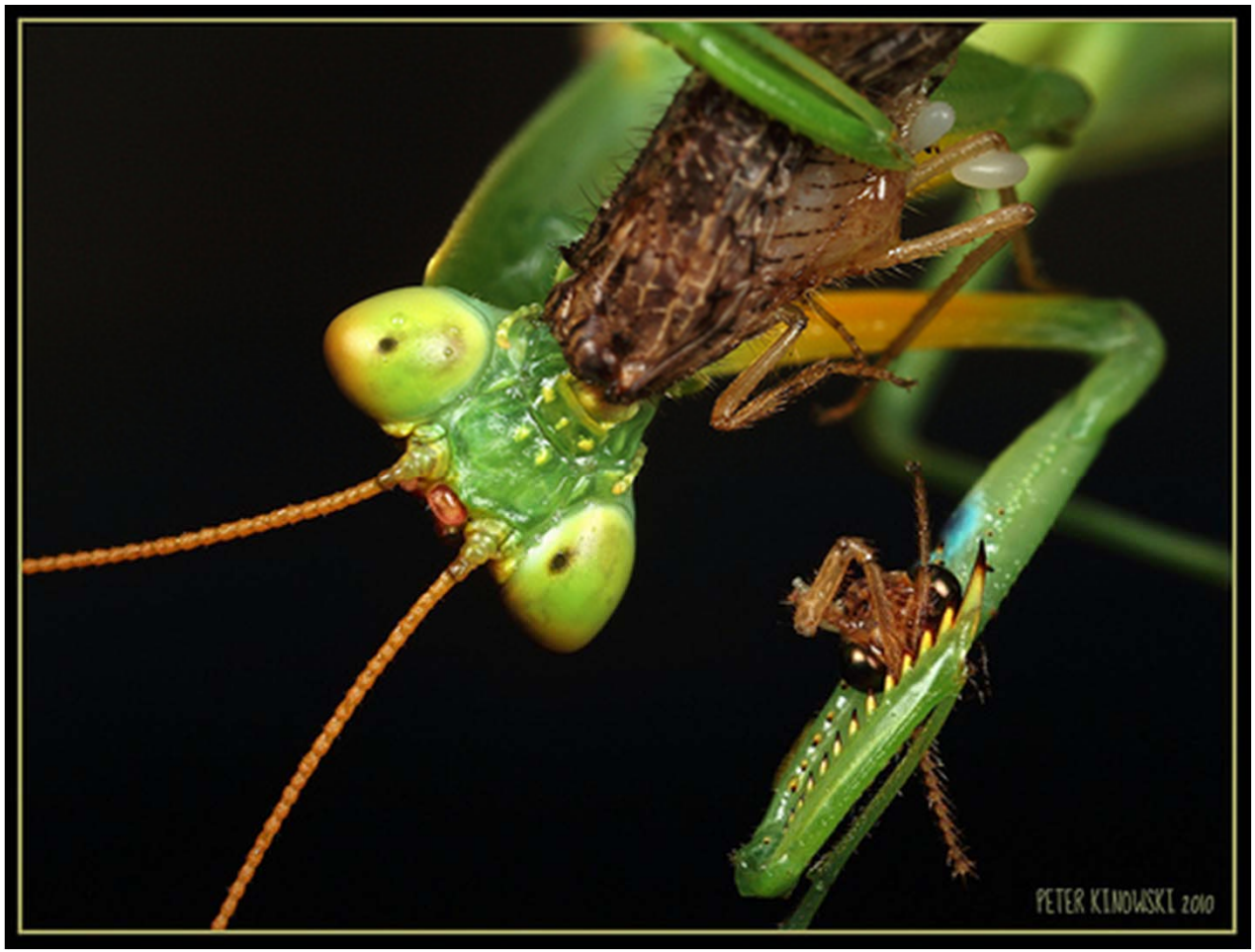
* Significantly different from untreated check

Research Efforts in 2011

Objectives:

- **Continue to monitor efficacy SilvaShield™ tablet against pine tip moth on 4 sites (2 in AR and 2 in TX).**
- **Continue to monitor efficacy of PTM™ and SilvaShield™ applied at different rates, depths and timing for control of pine tip moth.**
- **Continue to monitor effects of SilvaShield™ alone and combined with fertilizer and/or weed control.**
- **Initiated trial to evaluate PTM™ applied to containerized plugs for tip moth control and tree growth improvements.**

I hear a dinner bell.



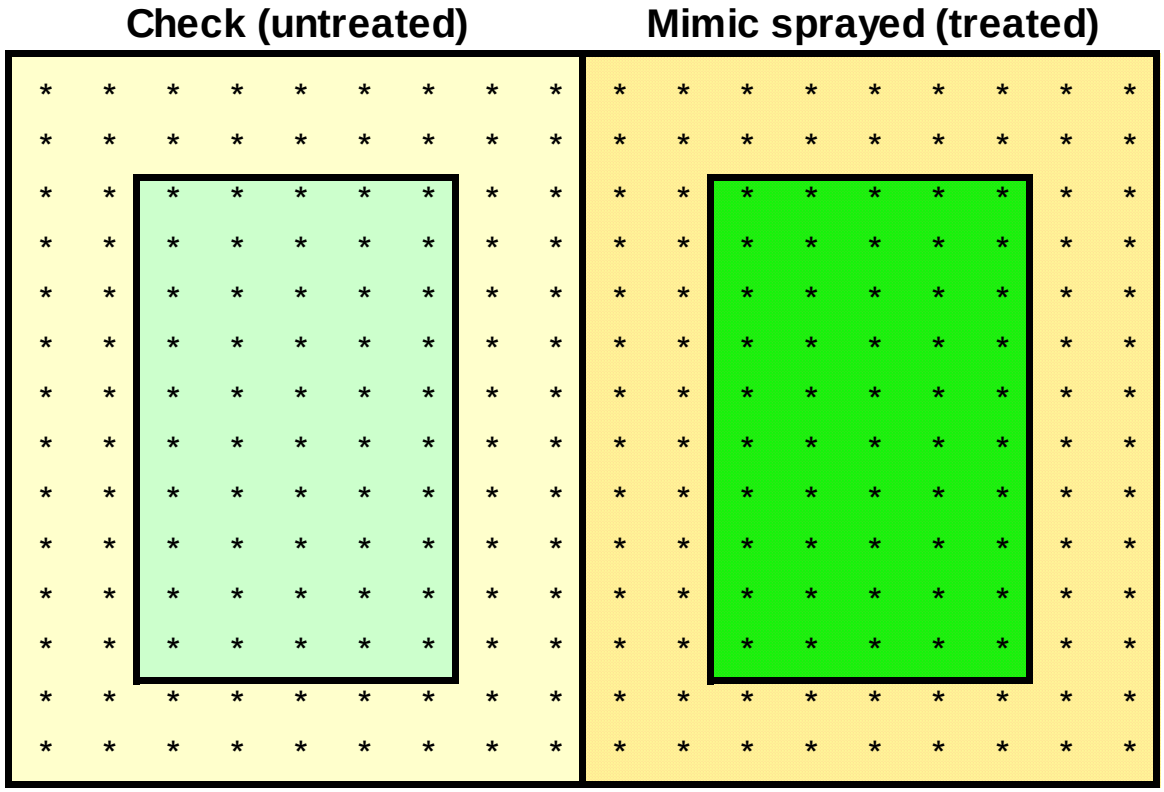
Tip Moth Impact and Hazard-Rating

Tip Moth Impact and Hazard-Rating: 2001 - 2010

Objectives

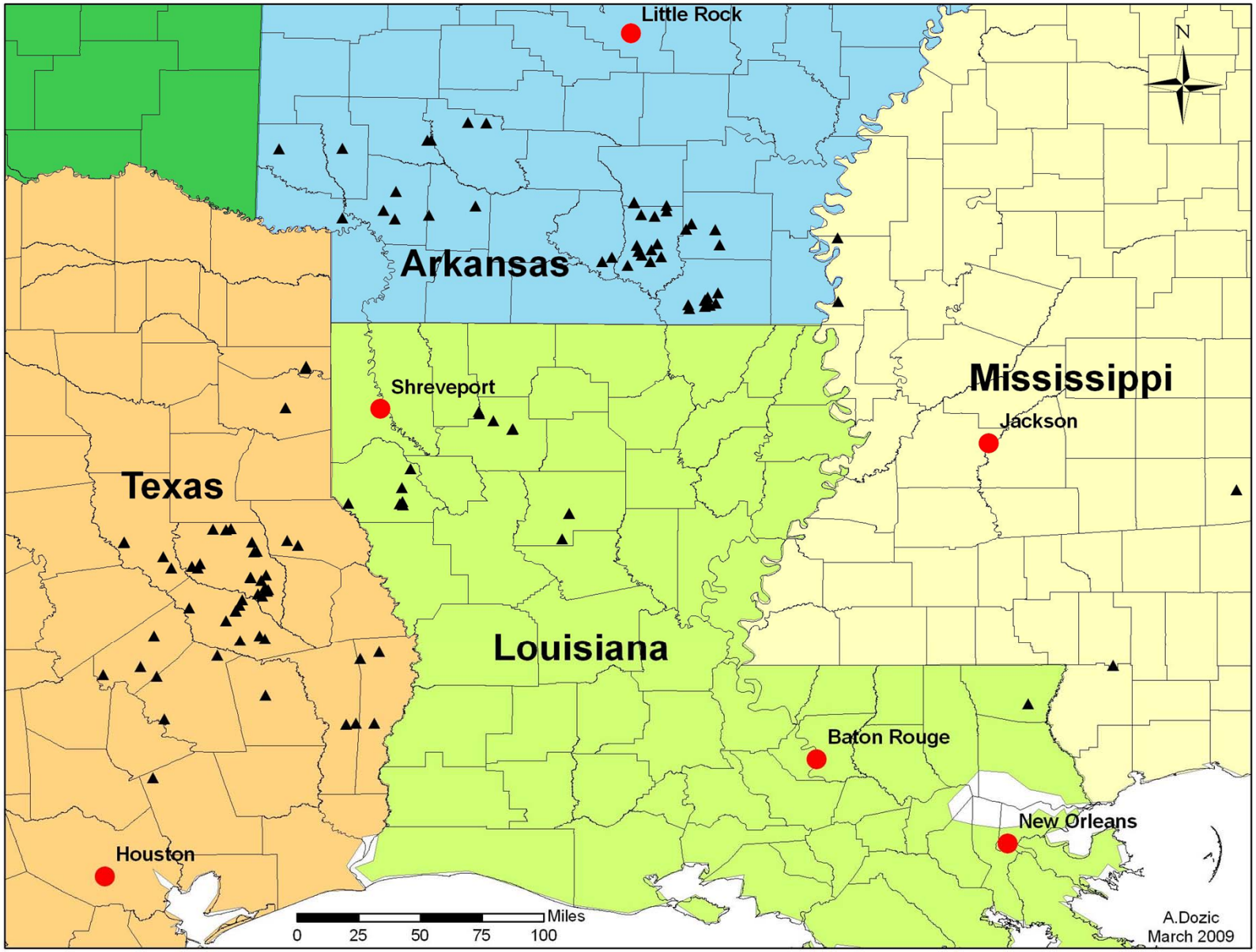
- Determine impact of tip moth on height and diameter growth and form of loblolly pine.
- Identify abiotic factors that influence the occurrence and severity of tip moth damage.

Layout for Impact/Hazard-Rating plots



Check plot also Hazard-rating plot

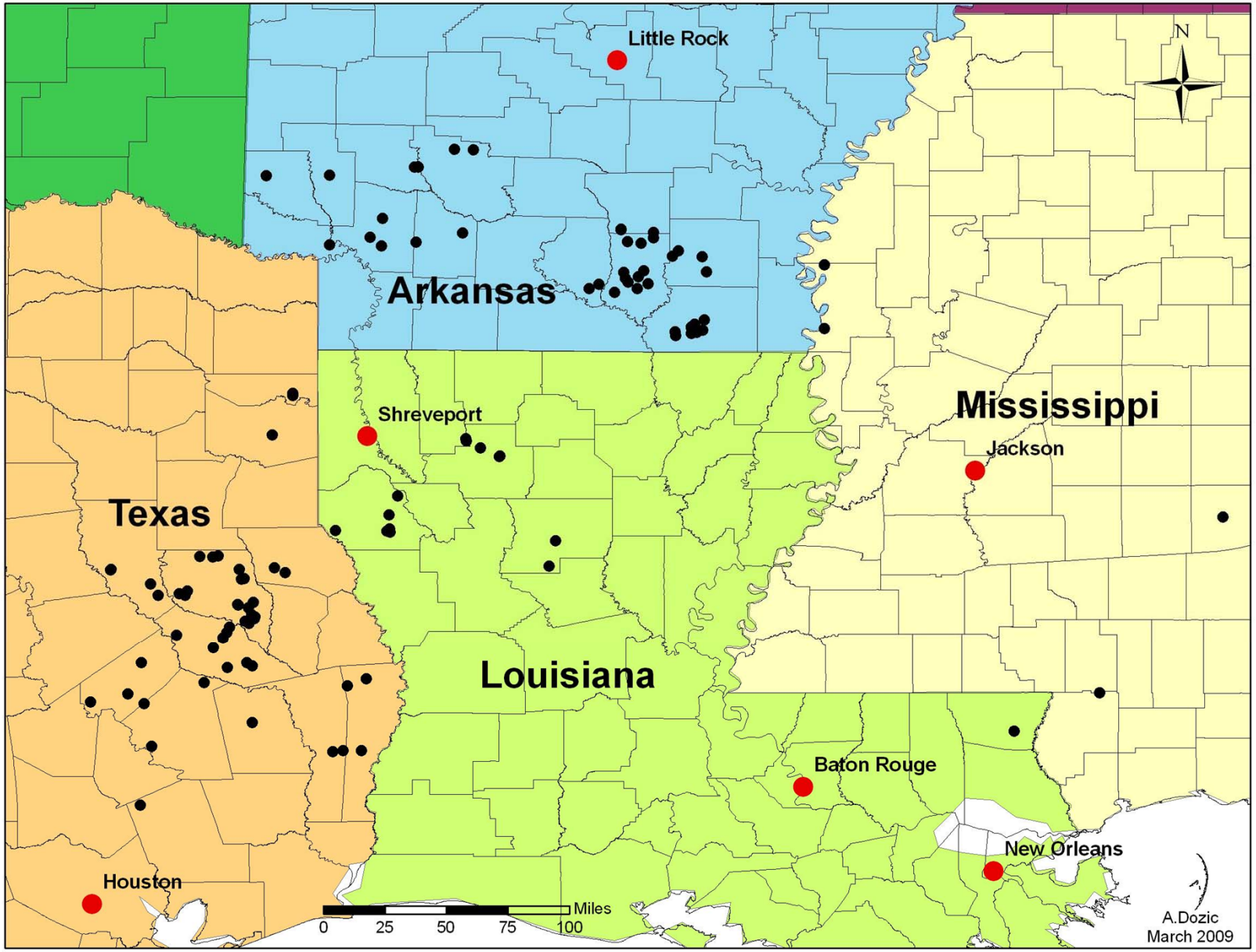
Impact Sites (110)



Site Characteristics

- Soil texture, drainage and nutrients
- Depth to horizons, hard-pan and gleying
- Site index
- Silvicultural prescription
- Slope, aspect, position, size
- Competing vegetation
- Rainfall
- Proximity and area of susceptible host type
- Percent tip moth infestation

Hazard Rating Sites (142)



Research Efforts in 2010

Tip Moth Impact and Hazard Rating

- 110 impact + hazard-rating plots established on 76 sites from 2001 – 2010. An additional 32 hazard-rating plots only were established during this period.

- As tip moth damage increases (0 – 10, 11 – 20, >20%) differences in growth between protected and unprotected trees also increase.

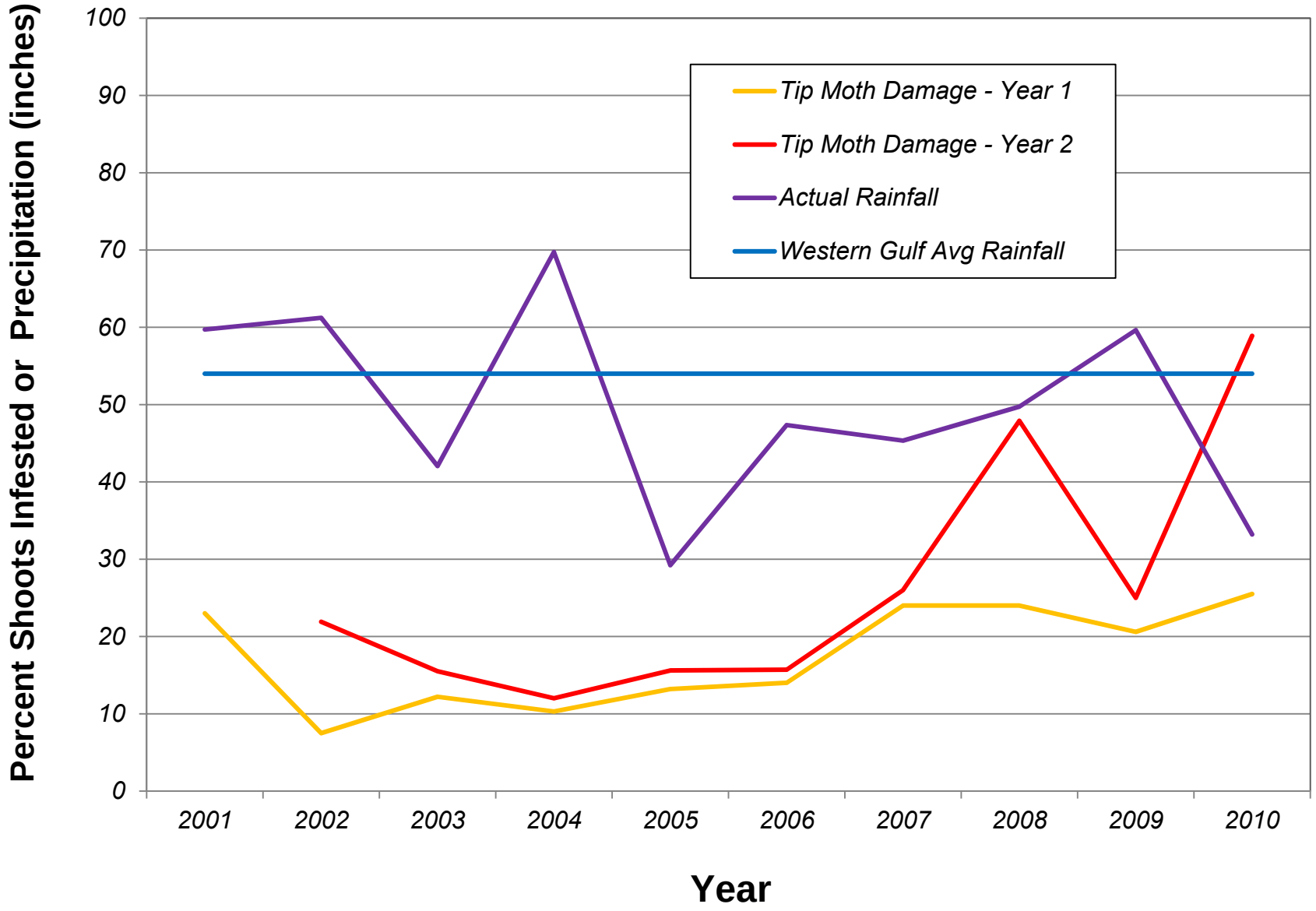
- Considerable progress was made in 2010 on cost/benefit analysis and hazard-rating model development. Mr. Trevor Walker and Dr. Dean Coble, SFASU, have nearly completed work on the project.

Mean percent of pine shoots (in top whorl) infested by pine tip moth on one- and two-year old loblolly pine trees following treatment with Mimic® after each generation in year 1 and 2, or PTM™ in year 1 (2009 and 2010); Arkansas, Lousiana, Mississippi and Texas sites, 2001 - 2010.

	Planted 2001 (N =16)		Planted 2002 (N=7)	(N=4)	Planted 2003 (N=10)	(N=9)	Planted 2004 (N= 8)	(N= 5)	Planted 2005 (N= 6)		Planted 2006 (N=29)	(N=22)
Treatment	Yr 1	Yr 2	Yr 1	Yr 2	Yr 1	Yr 2	Yr 1	Yr 2	Yr 1	Yr 2	Yr 1	Yr 2
Mimic®	1.8	3.8	1.5	3.8	1.2	1.2	1.4	1.8	3.0	7.2	5.0	13.2
Check	23.0	21.9	7.5	15.5	12.2	12.0	10.3	15.6	13.2	15.7	14.0	26.0
% Reductio	92	83	80	75	90	90	87	88	78	54	65	49

	Planted 2007 (N= 13)		Planted 2008 (N=15)		Planted 2009 (N= 3)		Planted 2010 (N= 4)		Mean Year 1	Mean Year 2
Treatment	Yr 1	Yr 2	Yr 1	Yr 2	Yr 1	Yr 2	Yr 1	Yr 2	(N=110)	(N=96)
Mimic®	15.5	17.1	4.4	7.7	0.6	16.7	3.3		5.1	8.8
Check	24.0	47.9	24.0	25.0	20.6	58.9	25.5		18.1	26.2
% Reductio	35	64	82	69	97	72	87		**72**	**66**

Relationship between rainfall and tip moth damage levels in the Western Gulf Region, 2001 - 2010.



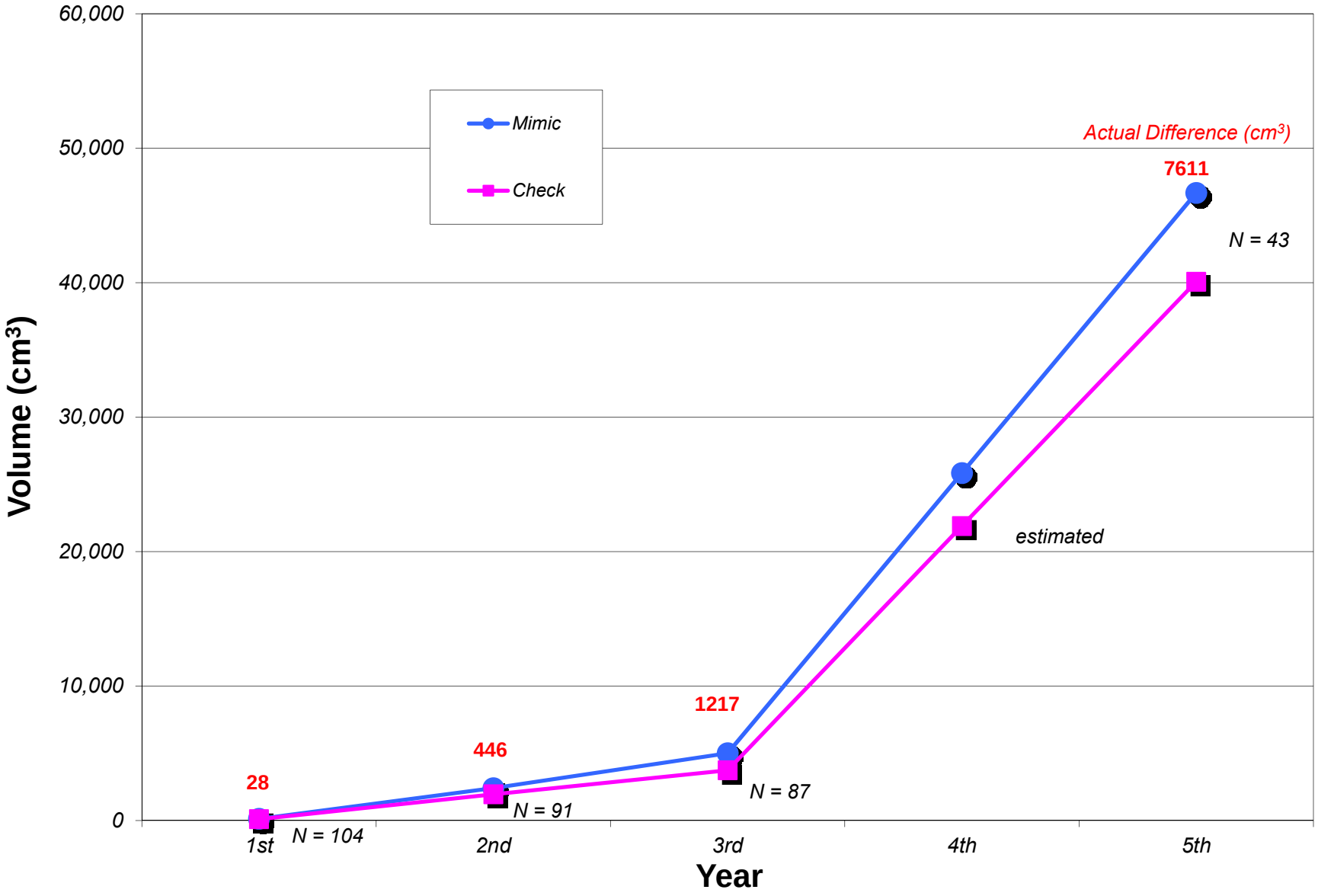
Trevor Walker
Graduate Student,
SFASU Arthur Temple College of Forestry and Agriculture

Mean tree height, diameter and volume index and percent growth gain and actual difference in growth of one-, two-, three- and five-year old loblolly pine following treatment with Mimic® after each generation in year 1 and 2; Arkansas, Lousiana, Mississippi and Texas, 2001 - 2010.

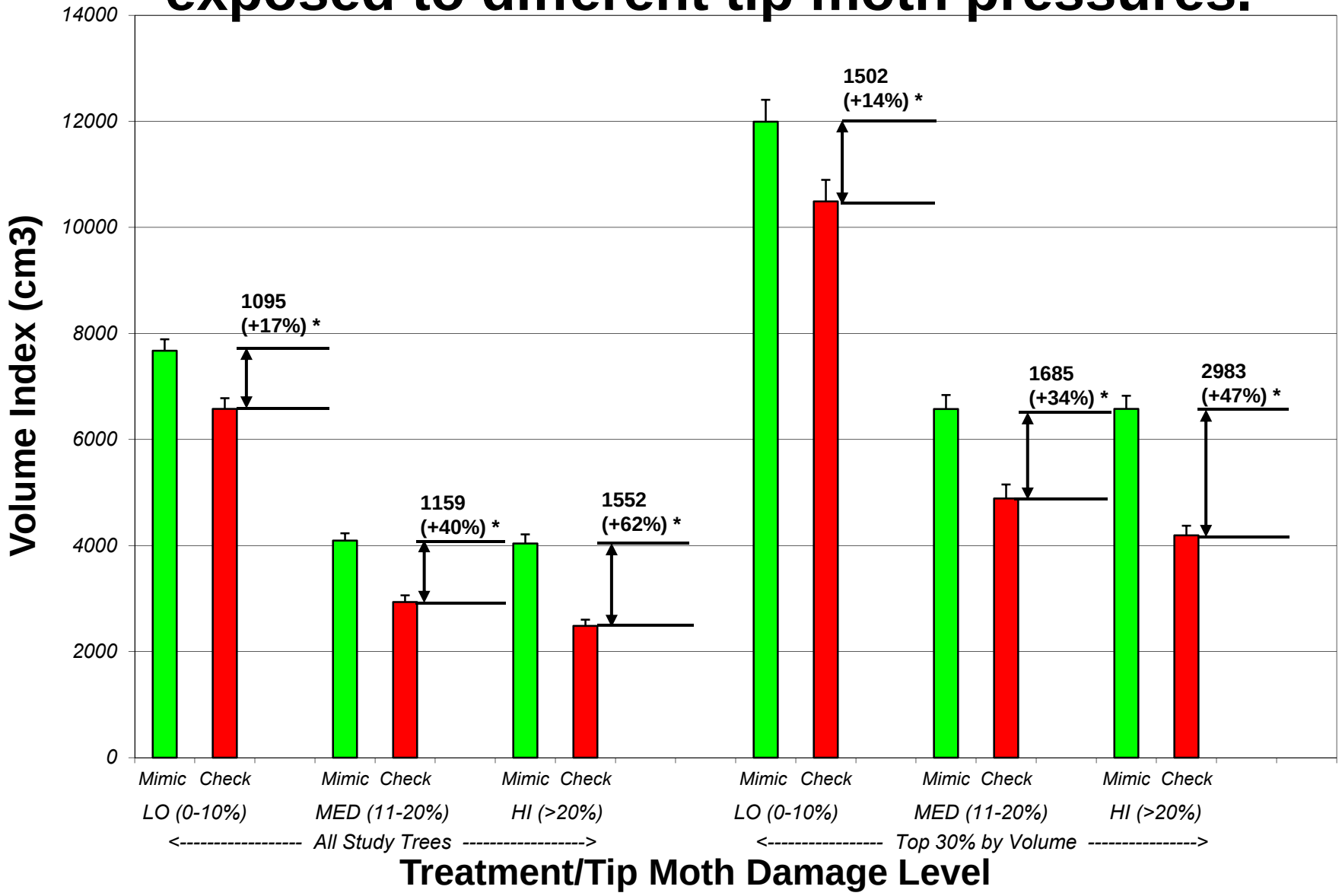
	Mean			
Treatment	Year 1 (N= 9516 trees on 104 sites)	Year 2 (N= 8560 trees on 91 sites)	Year 3 (N= 8165 trees on 87 sites)	Year 5 (N= 4104 trees on 43 sites)
	Height (cm)			
Mimic®	56.6	154	265	542
Check	51.3	141	241	514
Actual Diff. In Growth (cm)	5	14	24	28
Pct. Gain Compared to Check	**10**	**10**	**10**	**6**
	Diameter (cm)			
	at 6"	at 6"	at DBH	at DBH
Mimic®	1.15	3.18	3.32	9.04
Check	1.07	2.93	2.84	8.63
Actual Diff. In Growth (cm)	0.09	0.24	0.48	0.42
Pct. Gain Compared to Check	**8**	**8**	**17**	**5**
	Volume Index (cm^3)			
Mimic®	127	2386	4798	46084
Check	99	1940	3580	38473
Actual Diff. In Growth (cm)	28	446	1217	7611
Pct. Gain Compared to Check	**28**	**23**	**34**	**20**

Volume Index = Height X Diameter^2

Mean volume index (cm^3) of one- to five-year old Mimic®-treated and untreated loblolly pine: 2001 - 2010.



Differences in 3rd-year volume index (cm^3) of protected and unprotected loblolly pine exposed to different tip moth pressures.



Research Efforts 2011

- **Objective:** **Continue to build and strengthen data set through the continued monitoring of impact / hazard-rating plots.**

- **Obtain missing data from cooperators. Continue to work with Trevor Walker and Dr. Coble on cost/benefit analysis and hazard-rating model development.**

- **TFS install additional impact plots using PTM™ soil injection as the protection agent and hazard-rating only plots.**

Deer Repellent Trial - 2011

- **Justification:** **Deer cause significant damage to hardwood seedling in nurseries and after planting. Repellex USA has recently registered systemic tablet containing a natural hot pepper chemical, capsicum.**

- **Objective:** **Evaluate the ability of the Repellex systemic tablet to reduce/eliminate deer feeding damage on hardwood seedlings.**

- **Treatments:**

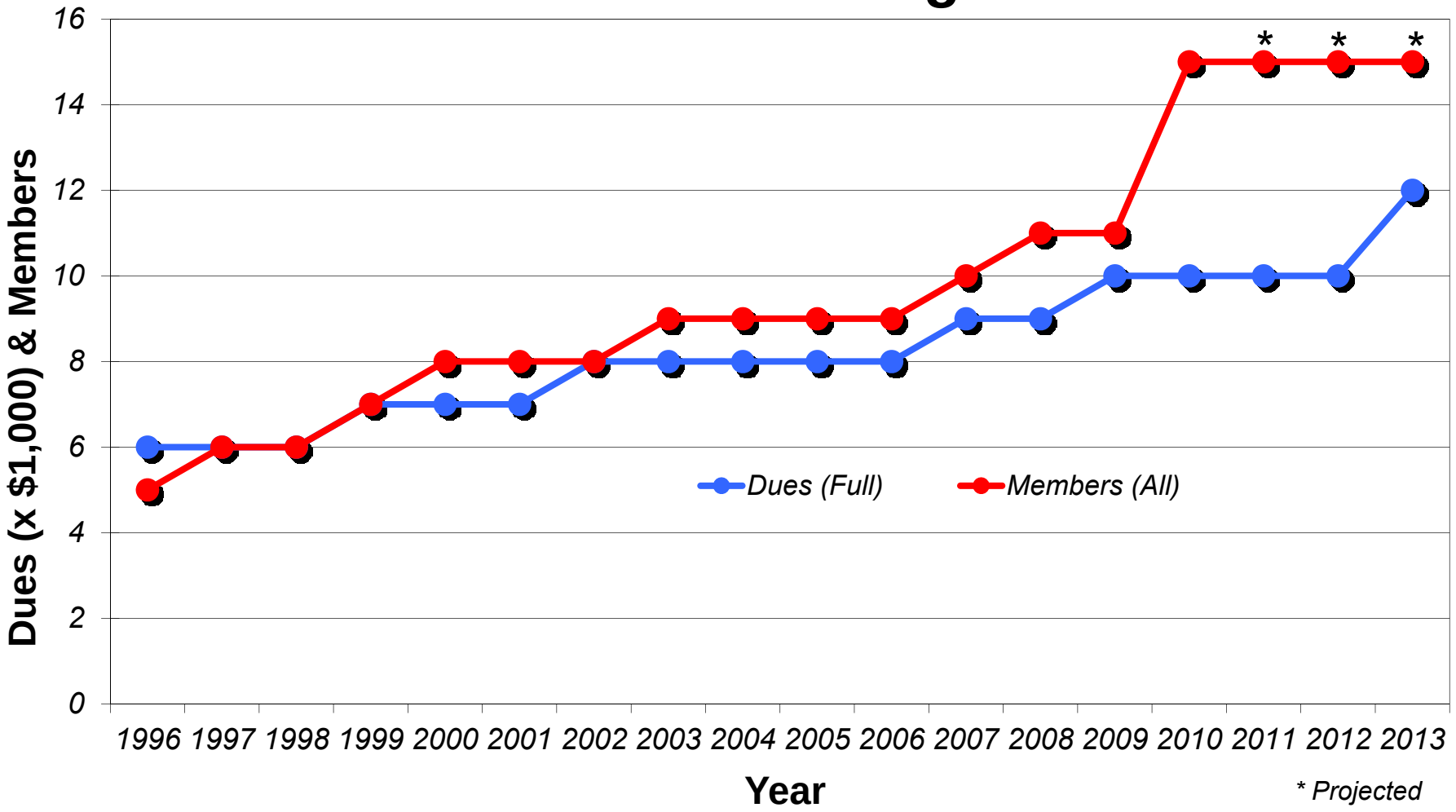
  Repellex tablets (2) applied at planting
  Repellex tablets (2) applied post plant next to seedling
  Deer Away BGR spray applied after planting
  Untreated Check

Other Issues

- **Training needs related to Tree-äge™, PTM™ (TM and LCA) and SilvaShield™? Separate or as part of Contact Meeting?**
- **FPMC Web Site (www.FPMCoop.com): offers password-protected access to proposals, reports, and newsletters. What about data?**
- **Forestry Pesticide web page**
- **Development of Container Plug Injection System**
- **New pest problems of concern?**
- **Anything else?**

Budget Matters

- 2010 Expenditures
- 2011 & 2012 Budgets



List of Funding Sources and Expenditures by Calendar Year

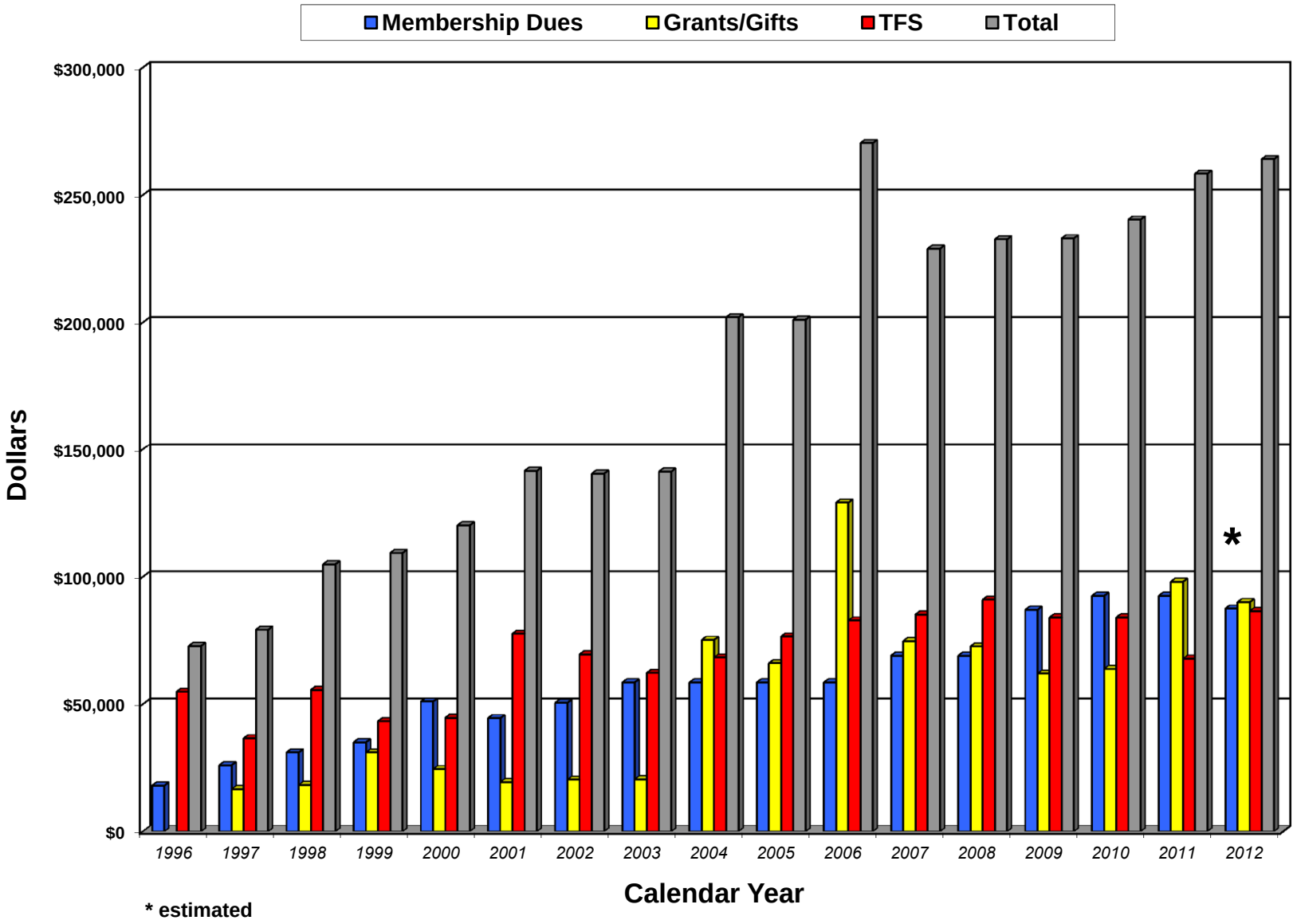
		Membership Dues						
Year	Assoc. Members **	Full / Assoc. / Year	Total Revenue	rants/Gifts	TFS	Total	Dues % of Total	TFS % of Total	
1996	3 / 1	$6K / ----	$18,000		$54,800	$72,800	25%	75%	
1997	4 / 1	$6K / $2K	$26,000	$16,600	$36,571	$79,171	33%	46%	
1998	5 / 0	$6K / $2K	$31,000	$18,300	$55,560	$104,860	30%	53%	
1999	5 / 0	$7K / $2.5K	$35,000	$31,000	$43,285	$109,285	32%	40%	
2000	7 / 1	$7K / $2.5K	$51,000	$24,488	$44,621	$120,109	42%	37%	***
2001	6 / 1	$7K / $2.5K	$44,500	$19,356	$77,600	$141,456	31%	55%	
2002	6 / 1	$8K / $2.5K	$50,500	$20,356	$69,512	$140,368	36%	50%	
2003	7 / 1	$8K / $2.5K	$58,500	$20,468	$62,206	$141,174	41%	44%	
2004	7 / 1	$8K / $2.5K	$58,500	$75,195	$68,301	$201,996	29%	34%	
2005	7 / 1	$8K / $2.5K	$58,500	$66,054	$76,517	$201,071	29%	38%	
2006	7 / 1	$8K / $2.5K	$58,500	$129,000	$82,847	$270,347	22%	31%	
2007	7 / 2	$9K / $3K	$69,000	$74,755	$85,156	$228,911	30%	37%	
2008	8 / 2	$9K / $3K	$79,000	$67,000	$86,553	$232,553	34%	37%	
2009	8 / 2	$10K / $3.5K	$87,000	$61,960	$84,000	$232,960	37%	36%	***
2010	8 / 5	$10K / $3.5K	$92,500	$63,818	$84,000	$240,318	38%	35%	***
2011 *	7 / 5 *	$10K / $3.5K	$92,500	$98,021	$67,811	$258,332	36%	26%	***
2012 *	7 / 5 *	$10K / $3.5K	$87,000	$90,000	$86,520	$263,520	33%	33%	***
Mean			$58,647	$54,773	$68,580	$178,778	32%	44%	

* estimated

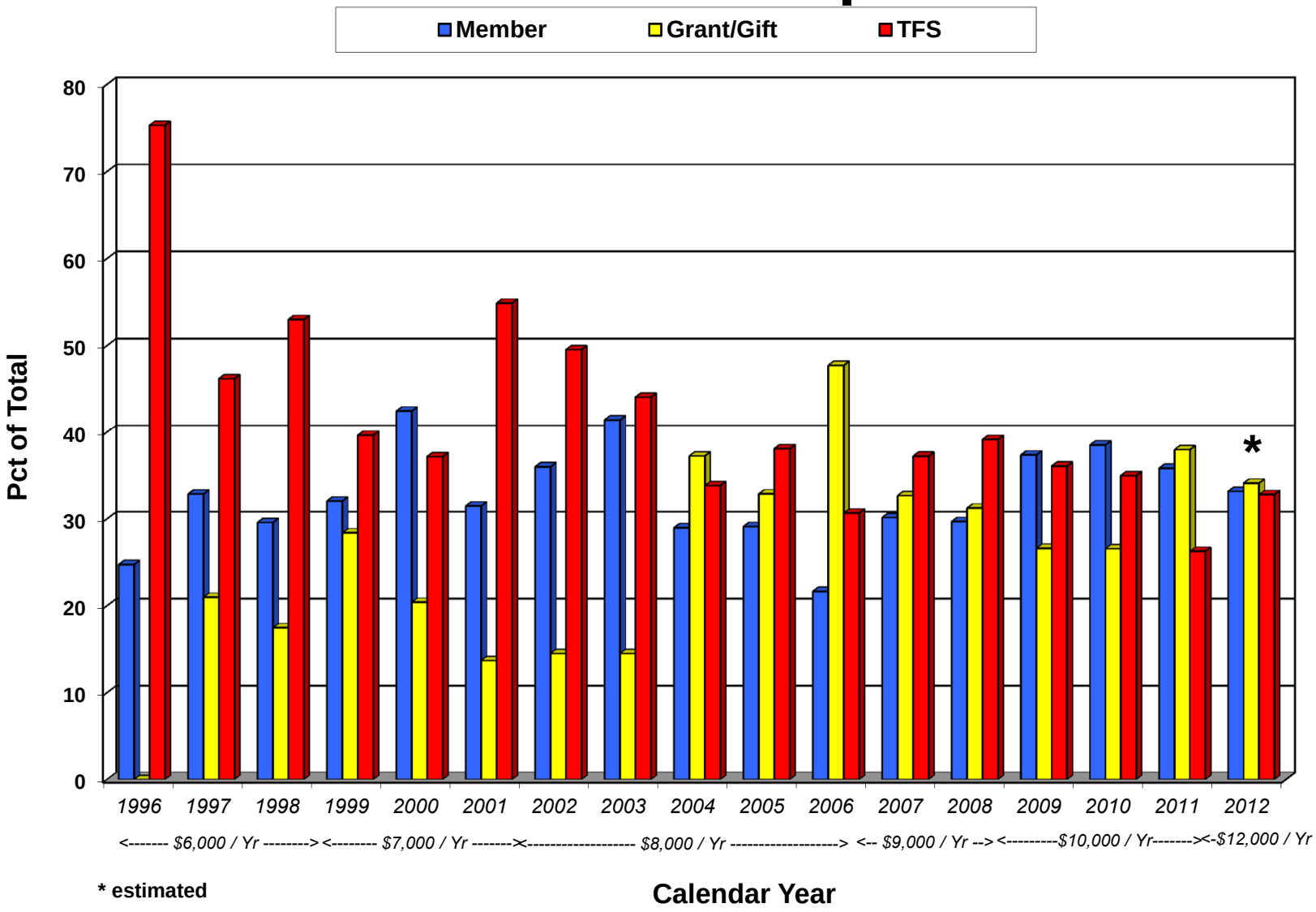
** Not including TFS

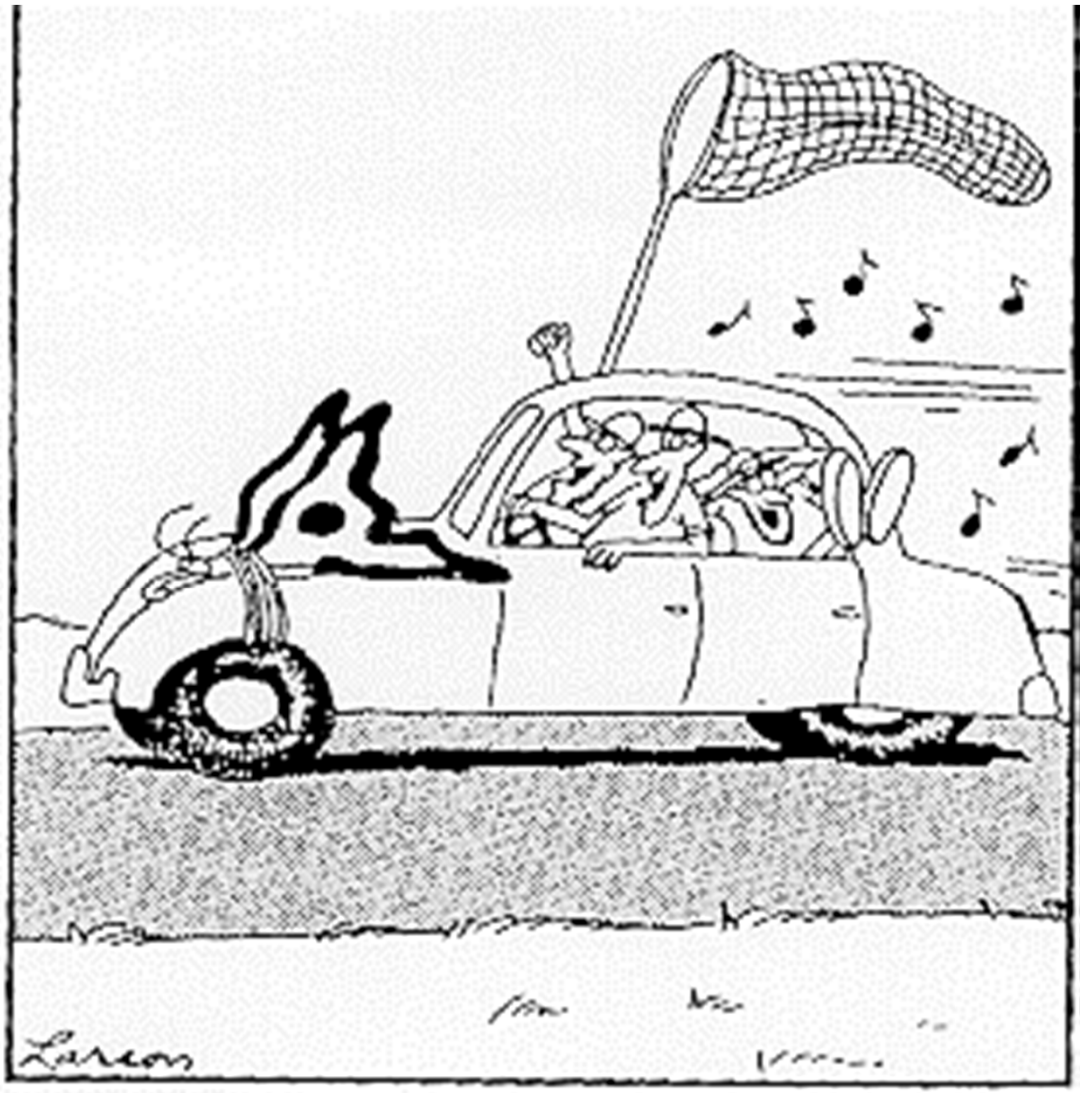
*** Years TFS not paying more than members.

FPMC Budget by Source



FPMC Dues, Grants/Gifts, and TFS as Percent of Total Expenditures





Thank you again for your support!!

THE END

Scott Nelson / Getty Images