



Western Gulf Forest Pest Management Cooperative: 1996 - 2005 10 Year Summary of Accomplishments

The Texas Forest Service (TFS) initiated the Western Gulf Forest Pest Management Cooperative (WGFPNC) in 1996, to address pest problems in pine seed orchards and young pine plantations. Under the direction of Research Coordinator Dr. Donald Grosman, and with the assistance of a small permanent staff, a number of seasonal employees, and contributions from members, the WGFPNC has completed 10 years of service. During this decade, major accomplishments have been achieved and several new chemical insecticides have been registered to improve forest pest management. A summary of these accomplishments follows.

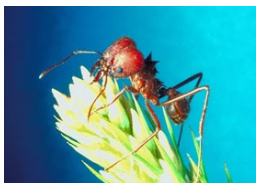
1. Major Accomplishments 1996 - 2005

When WGFPNC was established in March, 1996, there were five charter members: Boise Cascade Corporation, The Bosch Nursery, Champion International Corporation, Temple Inland Forest Products Corporation, and the Texas Forest Service. In 2005, membership consisted of nine members: Anthony Forest Products Company, Forest Investment Associates, International Paper Company, Plum Creek Timber Company, Potlatch Corporation, Temple-Inland Forest Products Corporation, Texas Forest Service, USDA Forest Service (Forest Health Protection), and Weyerhaeuser Company. Dr. Don Grosman has served as Research Coordinator and Dr. Ronald Billings as Administrative Coordinator, while numerous TFS staff persons and seasonal employees have assisted with Coop activities since the WGFPNC began (see list below). During the first decade of operation, significant progress has been made in relation to the following forest pests:



Regeneration Weevils

- Pales and pitch-eating weevils were found to be causing significant losses of pine seedlings on certain sites.
- A hazard rating table was developed to predict where losses to regeneration weevils are most likely to occur, based on date of harvest and other factors.
- Based on WGFPNC field trials, the insecticide Pounce® was registered by the Environmental Protection Agency for preventing weevil damage to newly-planted seedlings on high hazard sites.
- In 2005, the insecticide Waylay™ was registered in TX, LA, AR, MS, AL, GA, and VA for weevil control, based largely on WGFPNC efforts.
- The efficacy of fipronil for weevil control was evaluated.



Texas Leaf-cutting Ants (TLCA)

- Various baits were evaluated for control of TLCA.
- Sulfluramid bait proved to be very effective for control.
- A sulfluramid bait having the trade name Volcano® was registered in TX and LA for controlling TLCA, based on WGFPNC studies. Although very effective, production and sale of Volcano® was discontinued in 2003.



Texas Leaf-cutting Ants (Continued)

- A second bait containing fipronil, known as BES-100®, was also shown to be attractive to the ants and effective for eliminating TLCA colonies. Unfortunately, the producer of BES-100 will not seek EPA registration for this product in the U.S.
- Other baits, including Grant's Total Ant Killer bait and Amdro® Ant Block (hydramethylnon), were tested for attractiveness and control efficacy.



Seed Orchard Insects (Coneworms and Seed Bugs)

- Various approaches for injecting systemic insecticides into seed orchard trees were evaluated. Two chemicals, emamectin benzoate and fipronil, proved effective for significantly reducing coneworm damage.
- Emamectin benzoate, in particular, provided extended protection from coneworms - up to six years with a single injection.
- The WGFPMP assisted the Seed Orchard Pest Management Committee in the evaluation of Asana®, Imidan® and Capture® for control of seed orchard pests.
- Injections of imidacloprid, and thiamethoxam reduced damage by seed bugs in loblolly pine seed orchards, but the effects did not persist for more than one year.



Nantucket Pine Tip Moth

- Forty-four plots on 29 sites were established in TX, LA, and AR to assess the impact of tip moths on the growth of pine seedlings. Seedlings protected from tip moth damage with insecticide sprays for 2 years showed significant increases in height, diameter, and volume growth, compared to unprotected seedlings.
- A hazard rating model for tip moths was developed, based on site factors from 76 sites.
- Multiple trials were conducted to evaluate fipronil, imidacloprid, and other chemicals, applied in the nursery and the field, for protecting pine seedlings from tip moths. Different application rates and techniques for applying insecticides for tip moth control were compared.
- Seedlings treated with a single application of fipronil grew at an accelerated rate through three growing seasons compared to seedlings unprotected from tip moth damage.
- Based on positive results from WGFPMP field trials, both fipronil and imidacloprid are expected to be registered with EPA in 2006 for protecting pine seedlings from tip moths.



Bark Beetles

- Several systemic chemicals were tested as a means to prevent attack and/or brood production of southern pine engraver beetles (*Ips* spp.).
- Emamectin benzoate and fipronil proved especially effective in preventing *Ips* attacks on standing, weakened pines as well as on pine logs.
- In conjunction with cooperators, the WGFPMP has implemented studies to evaluate the efficacy of emamectin benzoate and fipronil for protection of trees from *Dendroctonus* bark beetles, including the southern pine beetle in MS, the western pine beetle in CA, the mountain pine beetle in ID and British Columbia, and the spruce beetle in UT.

Other Accomplishments

- Systemic insecticides are being evaluated for prevention of acorn weevils in live oak and for termites in pine.
- Sporax™ (Borax fungicide) was reregistered in Texas for prevention of annosus root disease.
- A “Forestry Pesticides” web page was developed to provide information on pesticides registered for use in forestry.
- The newsletter *PEST (Progress, Education, Science and Technology)* has been prepared and distributed quarterly to WGFPMC members.
- Annual reports of accomplishments have been prepared and presented to members of the WGFPMC Executive Committee.
- A meeting has been held annually for Contact Members to discuss accomplishments and future plans. A field trip and/or demonstration of new technology are highlights of this meeting.
- Numerous publications have been prepared to document WGFPMC accomplishments (see list below).
- Technical assistance and information on forest pests were provided upon request to members.
- In the last 10 years, the WGFPMC has generated a total of **\$291,817** in federal research grants and donations from chemical companies to supplement its research projects. These donations, coupled with staff support from the Texas Forest Service, have allowed the WGFPMC to maintain membership dues at a low level (see Figures 1 - 4).
- Membership in the WGFPMC has grown from five charter members in 1996 to nine members in 2005, despite forest industry mergers, industrial land divestments, tight budgets, and other limiting factors.

2. List of WGFPMC Publications

Newsletters and Reports

Grosman, D.M., and R.F. Billings. Quarterly 1996 - Present. *PEST* Newsletter. Western Gulf Forest Pest Management Cooperative.

Grosman, D.M., and R.F. Billings. 1996. Annual Report. Western Gulf Forest Pest Management Cooperative.

Grosman, D.M., R.F. Billings, and F.A. McCook. 1997. Annual Report. Western Gulf Forest Pest Management Cooperative.

Grosman, D.M., R.F. Billings, F.A. McCook, and W. W. Upton. 1998. Annual Report. Western Gulf Forest Pest Management Cooperative.

Grosman, D.M., R.F. Billings, F.A. McCook, and W. W. Upton. 1999. Annual Report. Western Gulf Forest Pest Management Cooperative.

Newsletters and Reports (Continued)

Grosman, D.M., R.F. Billings F.A. McCook, and W.W. Upton. 2000. Annual Report. Western Gulf Forest Pest Management Cooperative.

Grosman, D.M., R.F. Billings, and W.W. Upton. 2001. Annual Report. Western Gulf Forest Pest Management Cooperative.

Grosman, D.M., R.F. Billings, and W.W. Upton. 2002. Annual Report. Western Gulf Forest Pest Management Cooperative.

Grosman, D.M., R.F. Billings, and W.W. Upton. 2003. Annual Report. Western Gulf Forest Pest Management Cooperative.

Grosman, D.M., R.F. Billings, and W.W. Upton. 2004. Annual Report. Western Gulf Forest Pest Management Cooperative.

Grosman, D.M., R.F. Billings, W.W. Upton, and J. Helvey. 2005. Annual Report. Western Gulf Forest Pest Management Cooperative.

Technical Articles

Billings, R.F., and D.M. Grosman. 1997. Pounce on weevils to protect pine seedlings. Texas Forestry. December.

Grosman, D.M. 1999. Volcano, a new bait registered for leaf-cutting ant control in Texas. Texas Forestry. November.

Grosman, D.M., R.F. Billings, F.A. McCook, and W.W. Upton. 1999. Influence of harvest date and silvicultural practices on the abundance and impact of pine reproduction weevils in western gulf loblolly pine plantations. Proceedings 10th Biennial Southern Silvicultural Research Conference Shreveport, LA. Feb. 15-18, 1999. p. 565 – 568.

Grosman, D.M., R.F. Billings, F.A. McCook, and W.W. Upton. 2001. Systemic insecticide injections for control of cone and seed insects in loblolly pine seed orchards. Proceeding of North American Forest Insect Work Conference, Edmonton, Alberta. Feb. 15-18, 2001. p. 565 – 568.

Berisford, C.W., and D.M. Grosman, (eds.). 2002. The Nantucket pine tip moth: old problems, new research. Proceedings of an Informal Conference The Entomological Society of America, Annual Meeting. Atlanta, GA Dec. 12-16, 1999. USDA Forest Service, So. Res. Stat. Gen. Tech. Rep. SRS-51. 68 pp.

Fettig, C.J., J.T. Nowak, D.M. Grosman, and C.W. Berisford. 2003. Nantucket pine tip moth phenology and timing of insecticide applications in the Western Gulf Region. Res. Pap SRS-32. Asheville, N.C.: U. S. Dept. of Agric. For. Serv. South. Res. Stat. 13 p.

Publications in Scientific Journals

- Grosman, D.M., F.A. McCook, W.W. Upton, and R.F. Billings. 2002. Systemic insecticide injections for control of cone and seed insects in loblolly pine seed orchards – 2 year results. *Southern J. Applied Forestry* 26: 146-152.
- Grosman, D.M., F.A. McCook, W.W. Upton, and R.F. Billings. 2002. Attractiveness and efficacy of fipronil and sulfluramid baits for control of the Texas leaf-cutting ant. *Southwestern Entomologist*. 27: 251-256.
- Asaro, C., R.S. Cameron, J.T. Nowak, D.M. Grosman, J.O. Seckinger, and C.W. Berisford. 2003. Efficacy of wing versus delta traps for predicting infestation levels of four generations of the Nantucket pine tip moth (Lepidoptera: Tortricidae) in the southern United States. *Environmental Entomology* 33: 397-404.
- Grosman, D.M., and W.W. Upton. 2006. Efficacy of systemic insecticides for protection of single trees against southern pine bark beetles (Coleoptera: Curculionidae, Scolytinae) and wood borers (Coleoptera: Cerambycidae). *J. Economic Entomology* 99: 94-101.

3. List of Past and Current Members:

- Boise Cascade Corporation (1996 – 1997)
The Bosch Nursery (1996 –1997)
Champion International Corporation (1996 – 2000)
Temple Inland Forest Products Corporation (1996 – present)
Texas Forest Service (1996 – present)
International Paper Company (1997 – 2005)
Louisiana Pacific Corporation (1998 – 2001)
USDA Forest Service – Forest Health Protection (1998 – present)
The Timber Company – (2000)
Willamette Industries (2000 – 2001)
Rhom and Haas, Inc. (2000)
Dow AgroSciences (2001)
Plum Creek Timber Company (2001 – present)
Weyerhaeuser Company (2002 – present)
Potlatch Corporation (2002 – present)
Anthony Forest Products Company (2002 – present)
Forest Investment Associates (2003 – present)

4. List of Current and Past Employees

Dr. Donald Grosman (FPM Entomologist and Research Coordinator, 1996 – present)
Dr. Ronald Billings, Assistant Department Head and Administrative Coordinator, 1996 – present)*
William Upton (Staff Forester, 1996 – present)
Jeff Anderson (Research Specialist, 1996 – 1997)
Bryce Burke (Seasonal, 1996)
Frank McCook (Research Specialist, 1997 – 2001)
Danny Lemmons (Seasonal, 1998)
Demond Johnson (Seasonal, 2000)
Javier Vara (Seasonal, 2001, 2002)
Jamie Burns (Seasonal, 2001 – 2005)
Matt Phillips (Seasonal, 2001 - 2002)
Allen Smith (SPB Prevention Specialist, 2002 – 2004)*
Joanne Murphy (Seasonal, 2002 – 2003)
Brian Pope (Seasonal, 2003 – 2005)
Valena Bryan (Seasonal, 2003 – 2005)
Billy Whitworth (Seasonal, 2003 – 2005)
Libor Myslevic (Visiting Forester, 2004)*
Mike Murphrey (SPB Prevention Specialist, 2004 – 2006)
Dustin Hollowell (Seasonal, 2004 – 2006)
Jeff Cruse (Seasonal, 2005)
Jason Helvey (Research Specialist, 2005 – present)
Eric Branton (Seasonal, 2005)
Greg Cheney (Seasonal, 2005 – present)
Vladimir Cizek (Visiting Forester and Seasonal, 2005* & 2006)
Cathy Wallace (FPM Secretary, 1996 – present)*
Martha Johnson (FPM Staff Assistant, 1996 – present)*
Joe Pase (FPM Entomologist 1996 – present)*
Carrie Chesbro (FRD budget analyst, 2002- – present)*

* Salary and benefits provided by sources other than WGFPMC

5. List of Funding Sources and Expenditures by Calendar Year

Year	Membership Dues	Grants/Gifts	TFS	Expenditures	Dues % of Total
1996	– \$18,000 (\$6K)		\$54,800	\$ 72,800	25%
1997	– \$26,000 (\$6K)	\$16,600	\$36,571	\$ 79,177	33%
1998	– \$31,000 (\$6K)	\$18,300	\$55,560	\$104,860	30%
1999	– \$35,000 (\$7K)	\$31,000	\$43,285	\$109,285	32%
2000	– \$51,000 (\$7K)	\$24,488	\$44,621	\$120,109	42%
2001	– \$44,500 (\$7K)	\$19,356	\$77,600	\$141,456	31%
2002	– \$50,500 (\$8K)	\$20,356	\$69,512	\$140,368	36%
2003	– \$58,500 (\$8K)	\$20,468	\$62,206	\$141,174	41%
2004	– \$58,500 (\$8K)	\$75,195	\$68,301	\$150,114	39%
2005	– \$58,500 (\$8K)	\$66,054	\$76,517	\$187,575	31%

Grants or Gifts

National Agricultural Pesticide Impact Assessment Program. 1997. D.M. Grosman and R.F. Billings. "Evaluation of alternatives to methyl bromide for control of the Texas leaf-cutting ant, *Atta texana*." \$16,600.

National Agricultural Pesticide Impact Assessment Program. 1998. D.M. Grosman and R.F. Billings. "Evaluation of sulfluramid, an alternative to methyl bromide for control of the Texas leaf-cutting ant, *Atta texana*." \$18,300.

National Agricultural Pesticide Impact Assessment Program. 1999. D.M. Grosman and R.F. Billings. "Continued evaluation of sulfluramid, an alternative to methyl bromide for control of the Texas leaf-cutting ant, *Atta texana*." \$15,000.

National Agricultural Pesticide Impact Assessment Program. 1999. D.M. Grosman and R.F. Billings. "Evaluation of systemic injections of emamectin benzoate, imidacloprid, and thiamethoxam for control of cone and seed insects in loblolly pine seed orchards." \$16,000.

Forest Service Pesticide Impact Assessment Program. 2000. D.M. Grosman and R.F. Billings. "Continued evaluation of systemic injections of emamectin benzoate, imidacloprid, and thiamethoxam for control of cone and seed insects in loblolly pine seed orchards." \$18,000.

Griffin L.L.C. 2000. D.M. Grosman and R.F. Billings. "Continued evaluation of Volcano™ (sulfluramid), an alternative to methyl bromide for control of the Texas leaf-cutting ant, *Atta texana*." \$5,300.

Western Gulf Forest Tree Improvement Program. 2000 – 2005. Radiograph analysis of pine seed for pine seed bug damage. \$10,104.

Grants or Gifts (Continued)

Forest Service Pesticide Impact Assessment Program. 2001-2002. D.M. Grosman and R.F. Billings. "Systemic insecticide injection rate study for control of cone and seed insects in loblolly pine seed orchards." \$36,000.

Forest Service Pesticide Impact Assessment Program. 2003-2004. D.M. Grosman and R.F. Billings. "Systemic insecticide treatment of loblolly pine seedlings applied prior to and at planting for control of pine tip moth." \$42,895.

BASF Chemical Company. 2004. \$50,000 gift to support research with tip moth, bark beetles and regeneration weevils.

USDA Forest Service Western Bark Beetle Initiative. 2005. C.J. Fettig, D.M. Grosman, S Munson, and C. Jorgensen. "Systemic trunk injections of emamectin benzoate and fipronil for protection of high-value western conifers from bark beetles." \$30,305.

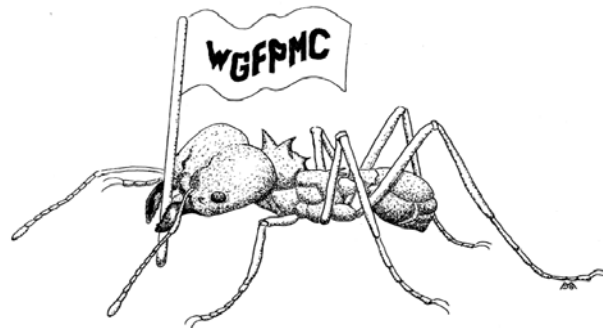
USDA Forest Service Southern Pine Beetle Initiative. 2005. D.M. Grosman and S. Clarke. "Systemic trunk injections of emamectin benzoate and fipronil for protection of southeastern pines from southern pine beetle." \$21,845.

Syngenta. 2005. \$10,000 gift to support seed orchard research.

Bayer Environmental Science. 2005. \$3,000 gift to support tip moth research.

6. Acknowledgments

As the Cooperative enters its eleventh year, appreciation is extended to Don Grosman and his dedicated staff, as well as to current and past WGFPMC members, for their many contributions and support that have made this effort a success.



10th Anniversary

March 2006