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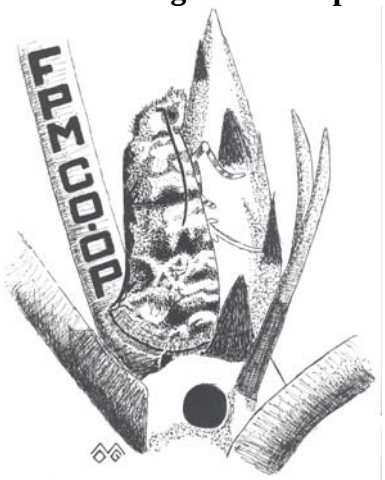
Quarterly Newsletter on Forest Pest Management Issues

Forest Pest Management Cooperative



Nantucket Pine Tip Moth, *Rhyacionia frustrana* (Comstock)

Texas Forest Service, Forest Pest Management,
P.O. Box 310, Lufkin, Texas 75902-0310

PEST is a quarterly newsletter that provides up-to-date information on existing forest pest problems, exotic pests, new pest management technology, and current pesticide registrations related to seed orchards and plantations. The newsletter focuses on, but is not limited to, issues occurring in the South (Texas to Florida to Virginia,).

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Announcements:

Soil Injection Training

Recent FPMC trials indicate that applications of PTM™ Insecticide are effective against leaf-cutting ants (see article to right). To try and ensure that future applications are successful, the FPMC will provide three or more training sessions in January 2010 for anyone interested in leaf-cutting ant control. Currently, training sessions have been scheduled for Jan. 7th near Camp Tonkowa (Nacogdoches Co.), Jan. 12th near the Tyler Co. Airport (Hwy 190, Tyler Co.), and January 19th in LA (site to be determined). All sessions will begin at 1:00PM. For addition information and/or directions to training sites, contact Dr. Don Grosman by phone at 936/639-8170 or by e-mail at dgrosman@tfs.tamu.edu.

PTM™ Insecticide: A New Soil Injection Treatment for Leaf-cutting Ant Control

Texas and Louisiana landowners who grow pine have a new effective control option for a major pest of pine seedlings - Texas leaf-cutting ant or town ant (*Atta texana*). The Environmental Protection Agency (EPA) has approved a revised full label in 2009 for PTM™ Insecticide that now includes use for control of the Texas leaf-cutting ant occurring in tree plantations. PTM®, containing the active ingredient fipronil, is produced by BASF. Research conducted by the Forest Pest Management Cooperative and Texas Forest Service has shown that soil injections of PTM™ are effective in completely halting ant activity in as little as 4 weeks with a single application.

Since Mirex bait was banned 30 years ago, methyl bromide had been the most effective option for control of the Texas leaf-cutting ant. However, methyl bromide was phased out in 2005. Other control options such as Eradicator™ thermal fog system and Volcano® and Amdro® Ant Block baits were recently registered for use against leaf-cutting ants, but Eradicator™ and Amdro® have proven ineffective and Volcano® is no longer available.

The Texas leaf-cutting ant (right; photo by R.S. Cameron) is a significant pest in areas of East Texas and west central Louisiana that have deep sandy soil and are being planted in pine. During the late spring, summer, and early fall months, the ants harvest plant material such as herbs, grasses, and hardwood leaves. This

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PTM (continued from Page 1)

plant material is brought back to the ants' colony where it serves as a substrate for a fungus that is the ants' primary food. However, during the winter months, after the grasses die back and hardwood trees lose their leaves, the ants switch to evergreen plants such as pine and yaupon. Newly-planted pines on tracts having one or more leaf-cutting ant colonies are likely to be killed as a result of defoliation by leaf-cutting ants. Ants foraging from established colonies, with a central nest area averaging 500 square feet, will commonly defoliate and kill nearly all pine seedlings within a 2-3 acre area around the colony.

PTM™ Insecticide is applied as a soil injection treatment to entrance/exit holes within and around the central nest area of the leaf-cutting ant colony. Worker ants that travel through the treated tunnels, pick up the active ingredient and carry it into their underground nests. After grooming and interaction, they distribute the active ingredient to the queen(s) and other ants, thus eliminating the entire colony in just a few weeks. Typically, in 1-2 weeks, a great reduction in soil excavation and foraging activities by the ants is observed. These activities gradually stop and the colony is completely inactive in 4-8 weeks. To prevent pine seedling losses, leaf-cutting ant colonies must be controlled in and around the area to be planted. Ant colonies are most easily located in late fall or early winter after leaf fall. PTM™ Insecticide should be applied at least 4 weeks before tree planting is initiated.

Applications of PTM™ Insecticide can be made any time of the year. However, several factors need to be taken into account to insure the best efficacy from the soil injection treatment. 1) Moisture: the PTM™ solution can be applied rain or shine. However, leaf-cutting ants are more inclined to excavate soil/build mounds after rainy periods, when soil moisture is high. 2) Temperature: the PTM™ dilution can be applied at any temperature (< 32 ^{o}F to >100 ^{o}F). However, it is recommended that PTM™ be applied when the ants are actively building mounds and holes are open; when temperatures are < 85 ^{o}F. 3) Season: PTM™ can be 100% effective in most seasons. However, during the summer months, the ants tend to cover the holes with debris making it difficult to locate all active entrance/exit holes. In addition, the ants tend to move their colonies into shaded areas as the temperature rises. This movement reduces exposure to the chemical treatment, thus reducing efficacy. Research has shown that PTM™ efficacy is greatest when entrance holes remain open through the day and the colonies maintain a position for an extended period in the late fall, winter and early spring.

To treat a leaf-cutting ant colony, first, locate the above ground central nest area (CNA, area of dense concentration of entrance/exit holes and mounds - usually greater than 5 mounds per sq. yd.). On average, there are about 30 entrance/exit holes per 100 ft^2 of central nest area (this does not include perimeter or foraging holes outside the CNA). Mix 2.6 fl oz (78 ml) of PTM per gallon of water to make a 2% dilution. Apply the PTM™ dilution using a suitable soil injection applicator [PTM™ Spot Gun through Red River Specialties (http://www.rrsi.com), PTM™ Injection Probe through Enviroquip (www.enviroquipinc.com), or Kioritz Soil Injector through several distributors]. Inject 1.5 fl ozs (45 ml) of PTM™ dilution (Table 1) at least 3 inches below ground into each exit hole within and outside the CNA (see below, photo by Don Grosman). DO NOT apply to the soil surface. Focus treatment on the most active area(s) of the colony. Check treated colonies and surrounding areas for ant activity 30-40 days and 80-100 days after treatment. **Note:** DO NOT apply more than 21 fl oz of PTM™ Insecticide per acre per year (this equals about 8 gal of dilution per acre).

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PTM (continued from Page 2)

Unlike methyl bromide, PTM™ Insecticide is not a restricted use pesticide. Therefore, landowners need not be certified applicators to purchase and apply this product. However, it is important that all users read the label and follow all precautions and guidelines.

PTM™ Insecticide is available in 2.5 gallon containers from several distributors including C3M, Helena, ProSource, Red River Specialties and UAP. Red River Specialties (Jasper and Shreveport) has quoted a price of $320 per gallon. Thus, the chemical cost to treat an average size colony (~600 ft^2) will be about $13.00. PTM™ will be available in 20 ounce containers in 2010.

For additional information on leaf-cutting ants and/or PTM™ Insecticide (labels and MSDS sheets), contact your local Texas Forest Service District Forester or Dr. Don Grosman by phone at 936/639-8170 or by e-mail at dgrosman@tfs.tamu.edu.

Table 1. Mixing Guide for PTM™ Insecticide

PTM Insecticide (2% dilution) Mixing Proportions

Total Volume (gal)	**Volume PTM** (fl oz)	**Volume water** (fl oz)
1	2.6	125
2	5.3	251
3	7.9	376
4	10.6	501
5	13.2	627
6	15.8	752
7	18.5	877
8	21.0	1003

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Thought You Might Be Interested to Know . . .

Fungicide Toxicity

(Summarized from information on the National Pesticide Information Center web site by Jim Schuster.via IllinoisPsticide Review, Nov./Dec. 2009)

Fungicides are used worldwide in industry, row crops, home landscapes & gardens, and vegetable and fruit production. Fungicides are used for multiple reasons, including seed protection during storage, shipment, and germination: and protection of edible and ornamental plants. Fungicides are also used in paints, paper pulp, carpets and fabrics in the home and shingles on many roofs.

The potential for injury or adverse effects in humans caused by fungicides varies enormously. In the past, the worst harm was caused by fungicides containing organic mercury or hexachlorobenzene. Fungicide risks today are much lower than they were years ago. Many of the current fungicides are unlikely to cause frequent or severe systemic poisoning for several reasons.

Today, many fungicides have a low inherent toxicity to mammals and are not absorbed though the skin very efficiently. Another reason is that many fungicides are suspensions of wettable powders or granules that have limited ability for rapid and efficient adsorption.

Current modern methods of application and use are such that intensive exposure is limited for most individuals. Proper use of protective clothing and equipment (commonly known as PPE) protects the skin and eyes. Reading and following all label directions also limits exposure.

In general, fungicides in use vary in their level of toxicity and other than organic mercury compounds, most fungicides are not likely to be absorbed efficiently or rapidly enough to cause systemic poisoning. Poison signs and symptoms are variable. Eye and skin decontamination as well as GI decontamination (if swallowed/ingested) needs to be done. Sometimes intravenous fluids may need to be administered. Fungicides are not cholinesterase inhibitors, so routine testing is not conducted.

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Fungicide (continued from Page 4)

Following are some of the widely used fungicides. If a listed fungicide has been known to cause systemic poisoning, National Pesticide Information Center information on management of poisoning and injuries is listed. For fungicides not known to have caused systemic poisoning, only general National Pesticide Information Center guidelines are listed.

Chloroneb is a wettable powder used to treat both soil and seed. It has very low oral toxicity in mammals but may cause a moderate skin and mucus membrane irritation. The metabolite dichloromethoxyphenol is excreted in urine. There are no reported cases of systemic poisoning in humans.

Chlorothalonil, a broad spectrum, non-systemic fungicide, is supplied as a wettable powder, a flowable powder and as a water dispersible granular. This fungicide is known to cause irritation to skin and mucus membranes of the eye and respiratory tract on contact. Allergic dermatitis contact has been reported, including one case of immediate anaphylactoid reaction to skin. Chlorothalonil seems to be poorly absorbed through skin and the gastrointestinal lining. No cases of systemic human poisoning have been reported.

Dicloran, a widely used broad-spectrum perishable produce fungicide is sold as a wettable powder, flowable powder, and a dust. It is or is partially eliminated via urine. One of the resulting breakdown products, DCNA, caused liver injury and corneal opacities when given in extremely high doses to lab animals. Based on these lab studies, large doses might cause liver injury, pyrexia, corneal opacities, and maybe methemoglobinemia. However, none of these symptoms have been seen in humans exposed to DCNA.

Hexachlorobenzene (not to be confused with the insecticide hexachlorocyclohexane) is usually available as dusts and powders for use as a seed protectant. At low dosage, this fungicide has only slight irritant effects and relatively low single-dose toxicity. In the 1950s, long term ingestion by Turkish farm dwellers of HCB-treated grain caused several thousand cases of toxicity. Most adults recovered after they stopped eating the treated grain. However, some nursing infants died while the mothers were eating the HCB-treated grain. Hexachlorobenzene is dechlorinated and oxidized in humans; exposed workers usually show only slight elevations of blood HCB concentrations. HCB can be measured in blood by gas chromatography. Chlorophenol metabolites can be measured in the urine.

For HCB contamination, skin exposure should be immediately washed off with soap and water. Flush contaminated eyes with plenty of water for 15 minutes. If irritation persists, seek specialized medical care. If a large volume of fungicide is swallowed, and no copious vomiting occurs, proper medical GI decontamination should be strongly considered. First aid directions for poisoning can be found on the product label. For more guidance, it is also recommended you call the Poison Control Hotline, 1-800-222-1222. Of course, in the event of an emergency, call 911.

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More Announcements:

Arctic® is Available

Recently, there has been some confusion about the availability of Arctic® 3.2 EC. This is the permethrin product that has 24Cs in several southern states that allow for spray applications to conifer seedlings to protect against regeneration weevils. Red River Specialties indicated that they could no longer obtain the Agriliances Arctic® 3.2 EC. Apparently, it was discontinued when UAP (plus Agriliance) was acquired by Agrilium. However, one result of this acquisition was the formation of WinField Solutions LLC. Arctic® 3.2 EC is available through this company. So, **yes** Arctic® is available . . . but for how long? To help insure the availability of permethrin products for seedling protection, the FPMC has submitted a request to Loveland Products to obtain a 24C registration in Texas for their Permethrin 3.2 EC product. I'll let you know if we are successful. If any other states wish to request a 24C for the Loveland product, a representative from the state needs to submit a letter of support to Mr. Mark Trostle, Loveland Products, P.O. Box 1286, Greeley, CO 80632. For additional information, you can contact Mr. Trostle by phone at (970)-534-3404 or email at mark.trostle@uap.com.

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Pest Spotlight: Ambrosia Beetles

Ambrosia beetles are beetles of the weevil subfamilies Scolytinae and Platypodinae (Coleoptera, Curculionidae), which live in nutritional symbiosis with ambrosia fungi and probably with bacteria. Several native species, including several *Platypus* spp., occur across the South. In addition, at least twelve exotic species, such as the granulated and redbay ambrosia beetles have been introduced since 1970. This article provides a brief overview of the biology and control options for a few of these beetles.

***Platypus* spp.:** The subfamily Platypodinae includes approximately 1,000 species, most of which are found in the tropics. Seven species of platypodids, all in the genus *Platypus*, are found in the United States. These beetles attack most species of pine and hardwood trees. They severely infest weakened and dying trees, green logs, and unseasoned lumber. Trees cut during the summer and left unmilled for more than 2 weeks are often severely damaged. This is especially true of gum, cypress, and oak trees. Ambrosia beetle attacks on green sawlogs and lumber may result in considerable degrade and strength reduction.

The adult beetles are elongate, dark reddish brown, about 1/4 inch (6 mm) long, and usually have sharp spines at the rear (right, photo by Gerald Lenhard).

In southern pines, large piles of a fine, white, granular dust accumulate below the entrance holes or at the base of standing trees (right, photo by R.F. Billings). In lumber, the galleries are darkly stained.

The adults and larvae do not feed on the wood but on a fungus the beetles carry into the tree and culture in the galleries. The adults bore into sapwood or heartwood of logs and lumber, making pinsized holes which are stained by the fungus. The females lay eggs in small clusters in the tunnel, and the developing larvae excavate tiny cells extending from the tunnel parallel to the grain of wood. There may be several generations a year. Timber is not attacked unless the moisture content of wood is above 48 percent. Seasoned lumber is never infested.

The granulate ambrosia beetle, *Xylosandrus crassiusculus* (Mot.), was introduced to South Carolina from Asia in the early 1970's. It has since spread throughout the southeast, gulf coast and as far north as Maryland. This tiny beetle is a pest of woody ornamental, fruit, and nut trees and can cause significant damage in nursery, landscape, and orchard settings. Ornamental nursery stock seems particularly susceptible. They have been reported to damage over 100 species of trees. However, species most commonly reported to be damaged in nurseries are styrax, dogwood, redbud, maple, ornamental cherry, Japanese maple, and crepe myrtle. Other reported hosts include pecan, peach, plum, persimmon, golden rain tree, sweet gum, Shumard oak, Chinese elm, magnolia, fig, and azalea.

Granulate ambrosia beetles emerge in early spring (March) and attack thin barked, deciduous trees. Numbers tend to peak around early April. However, they remain active at low levels through the summer and into the fall. There may be two or more generations in the South.

Female beetles are 2-3 mm long, stout bodied; dark reddish brown in color, with a dull, densely granulate surface of the elytral declivity (right, photo by J.R. Baker & S.B. Bambara). The females bore into the trunks and branches (1.0-2.5 inches in diameter) of young trees and excavate galleries in the heartwood. The female beetles inoculate trees with ambrosia fungus which can block xylem vessels and interfere with vascular transport. In addition, they can introduce or create entry points for pathogenic fungi such as *Fusarium* spp. Infested plants often die from boring damage, ambrosia fungus, or infection by a secondary pathogen.

Although tree health likely plays a role in susceptibility to these beetles, little is known about how trees are selected by female granulate ambrosia beetles. They attack seemingly healthy trees as well as stressed or unhealthy trees. Visible symptoms include wilted foliage and strands of boring dust protruding from small holes. Serious attacks that result in tree death usually occur during leafing-out stage.

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Ambrosia Beetles (continued from Page 5)

Infestations can be identified by toothpick-like strands protruding up to 1.5 inches from the host plant (right, photo by R.F Mizell). The strands of boring dust are produced by the female beetle as she excavates her gallery. The strands are fragile and are easily broken off by wind or rain leaving only pencil-lead sized holes. Individual plants may contain from one to more than 50 individual beetles.

Females bore into twigs, branches, or small trunks of susceptible hosts. They excavate tunnels in the wood, introduce ambrosia fungus and produce a brood. It is the growing fungus on which the beetles feed, not the wood. Eggs, larvae and pupae are found together. There are no individual egg niches, larval tunnels or pupal chambers. High humidity is required for successful reproduction. Females remain with their brood until maturity. Males are rare, small, and flightless and probably remain within the gallery. New females mate with their brothers, if present, before emerging to attack a new host.

Normally ambrosia beetles are considered beneficial because they accelerate the decay process in dead trees, which is important for nutrient cycling in healthy forests. However, the **redbay ambrosia beetle**, *Xyleborus glabratus*, and the associated wilt fungus (*Raffaelea* sp.) have become tree killers. Only one beetle is necessary to inoculate and kill a tree.

The redbay ambrosia beetle, which is thought to have been introduced into the U.S. in wood packing material, is currently found in Florida, Georgia, Mississippi and South Carolina. The beetle attacks trees within the *Lauraceae* family, particularly wounded trees. The beetle is devastating to redbay trees, and also attacks sassafras, pondspice, and pondberry. Pondberry is a federally listed endangered species and pondspice is a federal species of concern. Avocado may also be susceptible.

Redbay ambrosia beetles measures only about 2 mm. long. It is dark brown to black, glabrous or shiny and without hairs, and cylindrical in shape (below, photos by M.C. Thomas). The tip of its abdomen is somewhat V-shaped and pointed. Adult beetles can be found year-round along the coast, but occur at low numbers from late fall to early summer.

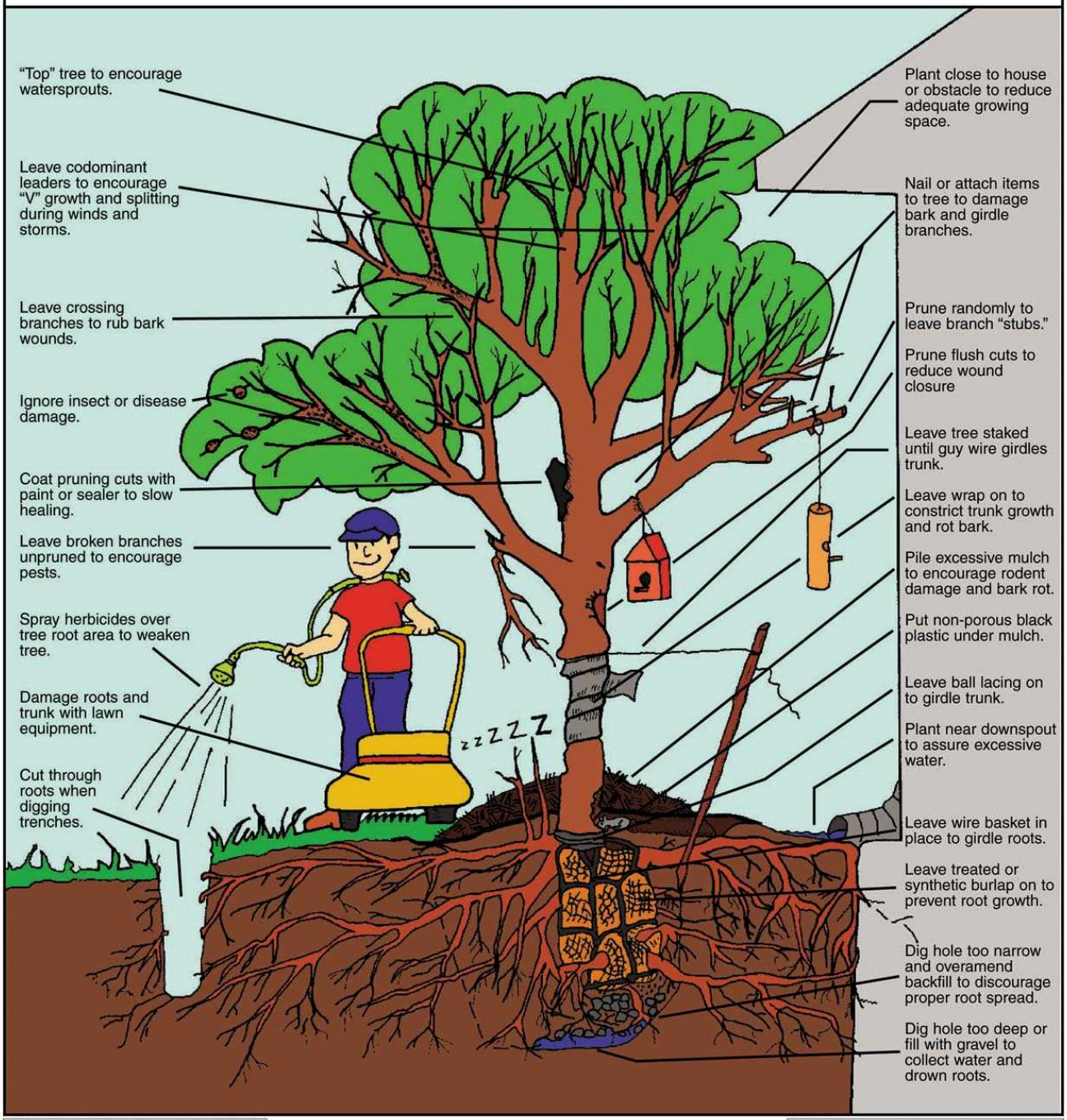
Beetles bore into wood to create tunnels or galleries where they lay eggs. This beetle can also produce toothpick-like strands on the bark surface. The tunnels become infected with the laurel wilt fungus (*Raffaelea* sp.) carried in special pouches on the beetles' heads. Larvae that hatch from the eggs live in the tunnels where they feed on the fungi.

Control Options: No chemical controls are recommended under forest conditions for *Platypus* spp. Rapid utilization of cut timber and fast drying of lumber will prevent damage. Winter harvesting and water storage are also effective.

Usually, ambrosia beetles attack trees suffering from some type of environmental or cultural stress (e.g., drought, flooding, freezing, nutrient deficiencies, etc.). Thus it is highly recommended to keep host trees as healthy as possible, especially optimizing nutrition and water management strategies to preclude nutrient deficiencies and drought stress. Preventative applications of insecticides, such as bifenthrin (Onyx® & OnyxPro™), permethrin (Astro® & Dragnet® SFR) and Chlorpyrifos (Dursban® 50W), may also protect trees by preventing successful penetration into the host. However, once beetles are inside trees they cannot be killed with insecticides and fungicides are ineffective against the ambrosia fungus. Thus, the timing of preventative insecticide applications is crucial to protect trees from damage by these pests. Infested plants or plant parts should be removed and destroyed. Redbay and other host forest wood species should not be moved or sold as firewood, tree trimmings, BBQ smoke-wood or mulch.

HOW TO KILL A TREE

Few residential trees die of "old age." Mechanical damage and improper tree care kill more trees than any insects or diseases. Avoid making the tree-damaging mistakes shown in the diagram below!



Poster Design by: Dr. Bonnie Appleton, Virginia Tech University
Layout: Drema Baker, Artifactory, Inc.
Illustrations: S.K. Kane

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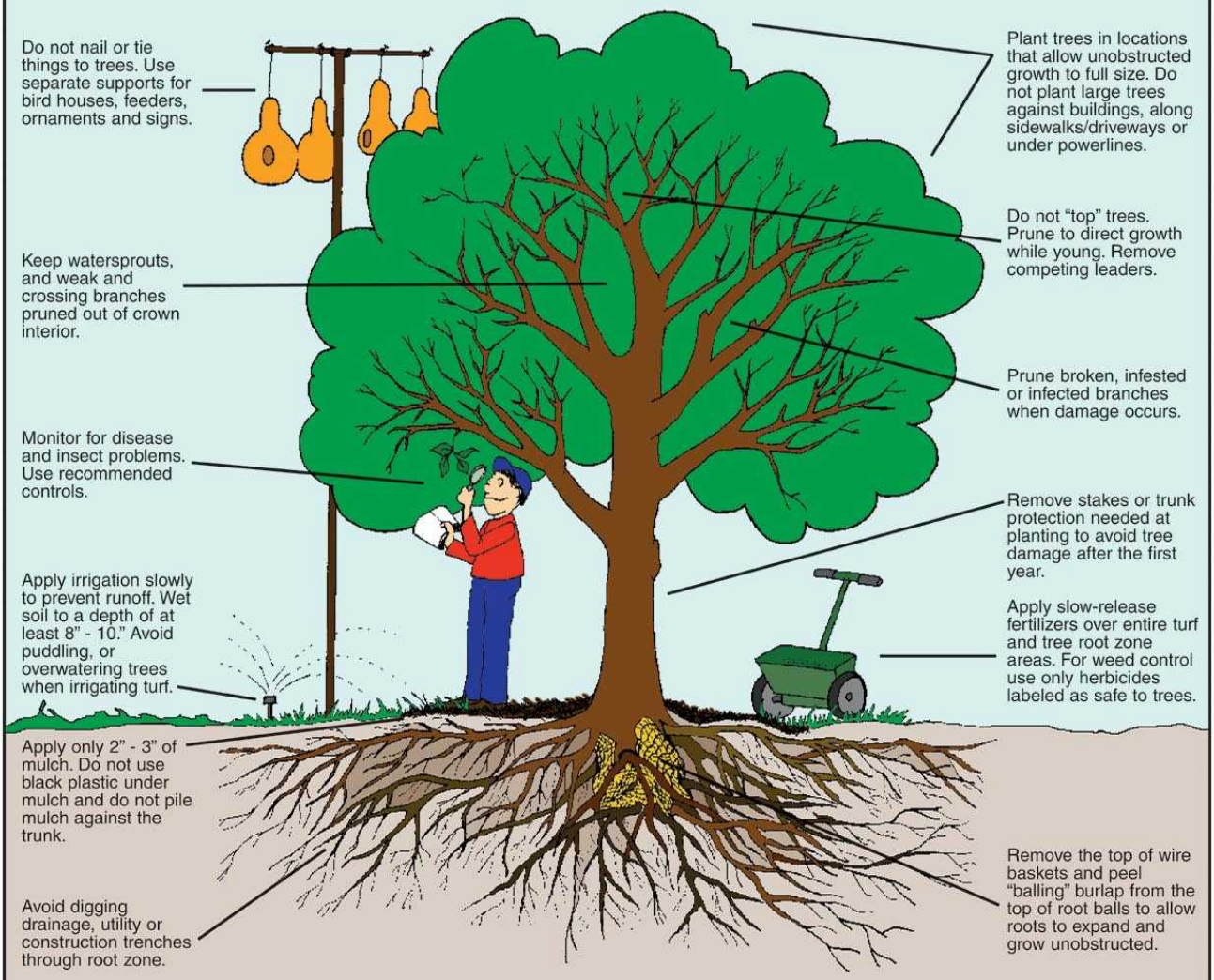
PROPER TREE MAINTENANCE

Start trees on the path to success by selecting the right tree for the right location. Use proper planting techniques to help roots re-establish quickly, and to help trees resume pretransplant growth rates. Keep trees healthy and encourage long life by following proper tree maintenance practices.



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