



MARCH 1993



THE PEST REPORT

Department of Forestry
P. O. Box 3758
Charlottesville, VA 22903

PEST REPORT

**DEPARTMENT OF FORESTRY
P.O. BOX 3758
CHARLOTTESVILLE, VIRGINIA 22903**

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PURPOSE: To Inform Department of Forestry personnel, interested agencies, organizations, and individuals.

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TABLE OF CONTENTS

| <u>Title</u> | <u>Page</u> |
|--|-------------|
| UPDATE | |
| Southern Pine Beetle | 1 |
| Gypsy Moth Populations | 1 |
| Gypsy Moth Quarantine | 1 |
| Hemlock Woolly Adelgid | 1 |
| Virginia Pine Sawfly | 2 |
| Cankerworms | 2 |
| Introduce Pine Sawfly | 2 |
| Tree Mortality | 2 |
| New Reporting System | 2 |
| Maple Syrup Country Problem | 2 |
| Atrazine Labels | 3 |
| White Pine Planting Sites | 3 |
| Beech Bark Disease | 3 |
| Recertification Training Session | 3 |
| Arsenal AC Respraying | 4 |
| Maintenance Burning Within Redcockaded Woodpecker Areas | 4 |
| Biological Control Attempt at Chippokes State Park | 5 |
| Six Common Misconceptions | 5 |
| Changes Regarding Endangered Plants and Insects | 5 |
| Memorandum of Understanding | 6 |
| Cooperative Effort with the Game Commission | 6 |
| 1992 Actual Chemical Use Figures | 7 |
| Old Treatment Plant | 7 |
| New Registered Technician Category | 7 |
| Pesticide and Ground Water Task Force | 8 |
| Ground Foliar Release Contract | 8 |
| Re-spray Uniformity | 8 |
| "Nozzle Heads" | 8 |
| "Proposed Guidelines for Management of Red-cockaded Woodpecker on Privately Owned Land" | 9 |
| North Carolina is Looking Into Forestry Use of Herbicides | 9 |
| Dogwood Antracnose | 9 |
| Unusual Request Category | 9 |
| "Record of Pesticide Use" | 10 |
| IT IS NOT JUNK MAIL! | 10 |

PEST WATCH

Pest Watch 11

PEST PRIMER

Beech Bark Disease 12
Care of Yard Trees - No. 3 13
Swamp Pink 15
Flatheaded Borers 16
Thinning and Southern Pine Beetle 17

PESTICIDE REVIEW

Escort 18

PEST ARTICLE

Nature Teaches Hard Lesson 20

UPDATE SECTION

A **southern pine beetle** update for 1992 and a Q and A format information sheet were recently distributed to all DOF offices. A color brochure for landowners and homeowners is in process, and should be available soon. Field reports for the last quarter of 1992 show that over 5,000 SPB spots had been located and about 12% of these were salvaged, which amounted to more than \$2.2 million worth of sawtimber and pulpwood. Field reports for the first quarter of 1993 are due by April 16.

Federal SPB funding has at last come through and we are in the process of hiring a dozen more wage personnel to help provide advice and assistance to landowners in hard hit areas.

After a large scale collapse of **gypsy moth populations** from both virus and fungus diseases in 1992, we could end up with less defoliation this year than last year's all time high. Proposed spray acreage is down to 67,450 from more than 200,000 in 1992. We don't expect to treat any state forest lands unless the chestnut grafts get infested again, but at least light defoliation could occur on the three northern forests as well as the Cumberland.

The **gypsy moth quarantine** in Virginia did not change from 1992 to 1993. Halifax county has been selected for intensive monitoring (i.e., male moth trapping) this year to assess gypsy moth status there. Male moths have already been trapped over most of the eastern half of North Carolina. The counties of Craig, Floyd, Franklin, Giles, Montgomery and Roanoke will be part of the new, cooperative Slow The Spread project that will apply various tactics to delay the rate at which low density gypsy moth populations reach outbreak densities.

Surveys to delimit the distribution of the **hemlock woolly adelgid** will continue through 1993. With few exceptions, it has been found wherever hemlock occurs naturally, except for some southwestern counties. John Severt found it all along the Blue Ridge Parkway to within a few miles of the Carolina line in Carroll county, and as far west as western Wythe county; but as yet it hasn't been detected in Grayson, Washington and Smyth counties or points west. Significant hemlock mortality is expected along the central Blue Ridge where populations have been at outbreak stage for two years or more. A proposal to evaluate biocontrol of this pest with fungi has been submitted to the US Forest Service, and an aerial insecticide spray test is planned for both spring and fall if arrangements can be made in time.

A **Virginia pine sawfly** egg survey by John Severt in January predicts light to moderate defoliation between Fredericksburg and Culpeper, and in the Shenandoah Valley and western Blue Ridge between Front Royal and Harrisonburg. Light defoliation is likely along route 6 from Columbia to George's Tavern and south along route 45 to Cumberland; along route 15 between Farmville and Keysville, and in Patrick county. Moderate to heavy defoliation is possible around Bristol in western Washington county.

Severt's sticky band surveys of adult **cankerworms** in Giles county predict moderate defoliation there again near Mountain Lake and on Flat Top Mountain.

Rob Trickel reported new defoliation by the **introduce pine sawfly** on white pine near Roanoke last summer. This pest can reach high population densities quickly, but parasite and predators generally knock them down after only one or two seasons. We plan to send Rob some parasites collected by Severt just in case.

Sketch maps of **tree mortality** in the western portions of Virginia have now been digitized by the US Forest Service in Atlanta and should be available soon. Most of the damage is related to drought, southern pine beetle and defoliation by gypsy moths and the looper complex. We hope to establish long term plots in many of these areas to monitor changes in species composition.

Please remember to use the **new reporting system** to document your assessments of various forest health conditions in your work area. For example, in May or June make an entry to characterize eastern tent caterpillar in your area for 1993, regardless of severity. THANKS.

As the people in Virginia's **maple syrup country** began the 1993 effort, they ran into an unusual **problem**. As you may know, tree taps are connected to tubing that join and eventually move material to the collecting facility. The problem is that this year squirrels are munching on the tubing and even the tree taps. Just what the squirrels are after or just why it is occurring this year has not been determined by the experts. Not being experts, we can venture a guess. 1991 was a tremendous year for mast production, one might think that would be an element in higher than normal reproductive potential and success. If indeed 1991 produced a bumper crop of squirrels, some are

bound to be getting hungry because in 1992, there was little if any mast produced. I suppose if times get tough, we'll try eating almost anything. The fall of 1992 may have presented excellent opportunities for those of us interested in squirrel and dumplings', but the price of maple syrup may go up in 1993.

As reported in earlier pest reports, **Atrazine labels** are undergoing some changes due to concern over ground water contamination. It appears now that Ciba Giegy will retain use of Atrazine over conifers on their label. All uses over hardwoods will be dropped. DuPont plans to drop all forestry uses from their labeled Atrazine product. Along similar lines, uses of Simazine over hardwoods will be dropped from labels. This continues to limit, not only our useable products over white pine, but future plans for product use with hardwoods as well.

For those in mountainous areas with **white pine planting sites** and a concern about blister rust, John Severt is available to assist you with site evaluations. If interested, John can also train you to examine your own sites for future use in evaluating blister rust hazard.

We have surveyed the Virginia area where **beech bark disease** was first located in 1985. A discussion of this insect/disease complex can be found in the pest primer section of this issue. Beech is a minor component in most Virginia areas, but there are some beautiful beech coves in the state. Personnel are urged to be aware of the symptoms mentioned in the pest primer article and to report any beech problems noted.

During February, Timberland Enterprises, with help and support from some chemical companies, hosted a **recertification training session**. Course approval had been granted for Forest Pest Control and Research and Demonstration categories. Todd Wilson and Patrick Kraft learned that these sessions are basically a "royal pain" to pull off successfully. We assisted with two presentations and were very pleased by the course content and interest shown by those in attendance. A VDACS inspector was in attendance and he seemed genuinely pleased. With a good experience now under their belt, I hope we can make this an annual effort. As you would imagine, training sessions for those seeking recertification in the Forest Pest Control category are few in number. There is usually only about one such session per year; the last one was at VPI. Approved training sessions will become even more important for our employees in that nearly all our personnel will require recertification before June 30, 1994.

Since we have been using **Arsenal AC**, the need for **respraying** tracts due to chemical failure has been rare. Still, when that is required, we have noticed that a respray the following year never gives results that we would expect from a single successful operation. Other people dealing with this product in Virginia have reported similar observations. With that in mind, we held off respray on some tracts for a two year period rather than our usual follow up where respray is conducted about one year following the original spray. Where we have held up for a two year period, results have been excellent. It may be that when resprays occur too quickly, the plant, for whatever reason, does not absorb and/or translocate the material. By waiting until the second year, that resistance factor seems to be gone. While keeping up with respray needs for two years is more difficult, that is the system that we will plan to use where tract failures are involved when Arsenal AC was used. The same would not apply for missed blocks or greenstreaks in that they were not sprayed in the first place.

R-1 personnel did the **maintenance burning** within the 185-acre **Redcockaded Woodpecker areas** that we aerially sprayed in 1991. The idea was to further reduce the hardwood understory and hopefully reduce the number of young pine in the understory. With all the wet weather, burn intensity was somewhat less than desired; a more complete assessment will be possible after growth begins this spring. We'll show one of the areas to the Virginia Pesticide Control Board during an April tour.



"We got your cat out of the tree, Mrs. Garner."

Some of you may recall an item mentioned in an earlier issue of the *Pest Report* about a small **biological control attempt at Chippokes State Park**. Annosus root rot was causing problems in a loblolly plantation that had already been thinned and additional cutting was planned. We applied an antagonistic fungus to new stumps. The idea was to allow the "good" fungus to takeover and utilize the new food base so the "bad" fungus would not have access to it. I continue to be amazed sometimes as to what turns the media on. R-1 personnel had appropriate media coverage during the effort and, from that humble beginning, the story was picked up and used by numerous radio and television stations and newspapers in Virginia. For whatever reason, the story did whatever is needed to turn the media on. In terms of newsworthiness, I would have given the story a 1 on a scale of 0 - 10 with 0 being the least newsworthy. I obviously don't understand what gets the media fired up; maybe we ought to invite them to more of the things we do and let them decide.

Dr. Bruce Aimes, University of California, Division of Biochemistry and Molecular Biology, recently listed **six common misconceptions** that have no scientific basis. There is no compelling epidemiologic or toxicologic evidence to support the notion that:

- 1) Pollution is a significant contributor to cancer and cancer rates are soaring.
 - 2) High-dose animal cancer tests identify significant cancer risks for humans.
 - 3) Almost all human exposures to carcinogens and other toxic chemicals are from synthetic chemicals.
 - 4) Synthetic toxins pose greater carcinogenic hazards than natural toxins.
 - 5) The toxicology of man-made chemicals is different from that of naturally-occurring chemicals.
 - 6) Correlation implies causation.
-

VDACS and the Board of Agriculture are considering some **changes regarding endangered plants and insects**. Currently, about four new plant species are proposed for endangered status that are currently not in our data base. One insect, the swamp

skimmer, is proposed for addition as threatened, Virginia round-leaf birch may be down graded from endangered to threatened and it is proposed to remove Bacopa stragula, mat forming water hyssop, from the list entirely. That removal should please personnel in New Kent, King and Queen and King William counties; currently those are the three counties where this hyssop is recorded.

Our current **Memorandum of Understanding** with VDACS is what permitted us access to specific locations of endangered plants and insects. A similar agreement was recently concluded with the Department of Game and Inland Fisheries. When we get things cranked up, we should be able to help personnel with information on the walking, crawling, slithering and swimming side of the endangered species effort.

The **cooperative effort with the Game Commission** that began in 1990 to evaluate the effect of pine release on quail habitat was concluded with the 2 - year post treatment evaluations in the fall of 1992. A joint report on that effort should be available by July 1993. Recall that we looked at 15 sites in the Piedmont and Coastal plain. Five sites were released with Arsenal AC alone, five were treated with the Arsenal AC/Accord mix and five sites remained untreated. All sites were evaluated prior to treatment and again at 1 and 2 years post treatment.



1992 actual chemical use figures have been submitted to VDACS. Figures represent actual use, not estimates, and result from the activity of the Virginia Forestry Herbicide User Group. During 1992, the Virginia forestry community operationally treated 57,509 acres using 71,149 pounds of herbicide active ingredients. Average use rate for all operational programs was 1.24 pounds active ingredient per acre per forest cycle ranging 25 - 50 years. Eleven active ingredients were used in 1992. Two active ingredients, Glyphosate and Imazapyr accounted for 82% of the 1992 operational forestry programs in Virginia. The addition of Hexazinone to the two active ingredients mentioned above would account for 94% of our 1992 forestry efforts. Almost 74% of our 1992 program involved pine release; use rates for that effort involved 0.88 pounds active ingredient per acre per forest cycle.

In a 43-page report from a contractor to EPA regarding our **old treatment plant** at the Appomattox Buckingham State Forest, it was concluded that "no further action is needed!" Maybe, just maybe the saga of the state forest treatment plant is over!

The **new Registered Technician category** regarding pesticide certification is fully underway. Unless our new employees have rather extensive previous experience in pesticide work, each will have to be a Registered Technician before being eligible to become certified in the commercial Forest Pest Control category. We have been approved to proctor and grade the Registered Technician exams. That approval extends to any of our industry friends as well. Approved testing locations include the Headquarters office and all Regional offices. For the Registered Technician grade, new employees must undergo at least 40 hours of appropriate training and apply to VDACS for permission to take the Registered Technician exam. With that approval, and after successfully completing the exam, the Registered Technician must remain in that grade for twelve months before being eligible to take the exam for commercial certification in Forest Pest Control. Commercial certification is good for a two-year period but must be renewed annually. VDACS notices regarding the need for renewal or recertification will be sent to the individual's home address rather than business address. In the past, some of these notices have been trashed by individuals without even opening the envelope under the assumption that it was "junk mail". We assure you that these notices are not junk mail; miss your renewal notice and you will have to take the exam again for recertification rather than attending an approved training course.

The state's **Pesticide and Ground Water Task Force** is moving right along. This group will develop a generic pesticide management plan as it relates to ground water. The generic plan becomes the shell for pesticide specific management plans when needed. In the future, EPA will specify certain pesticides as posing a threat to ground water. When that occurs, the generic plan will guide development of a plan that addresses the specific pesticide of concern. Without a specific state management plan for named pesticides, use of the material would probably be prohibited in the state. The task force hopes to have the generic plan ready for EPA by early spring 1993. VDACS will be the lead agency regarding the development of pesticide specific plans with water-issue input from the State Water Control Board, Division of Soil and Water Conservation and others as needed. Our input will be dependent upon the specific materials named by EPA. We would become involved if those named materials have forestry uses. Interestingly enough, among the first materials I expect to see EPA list is Atrazine.

If all goes well, we will try a **ground foliar release contract** in the Farmville region during 1993. It will be similar to the aerial contracts that we currently coordinate for our landowners, but in the ground effort, the contractor and each landowner have a direct agreement and payment for services is made by the landowner directly to the contractor.

Reports from spray coordinators are generally favorable regarding re-spray/green streak criteria, color prints showing re-spray needs for the pilot and spray map approval by both pilot and forester. The overall intent was to increase **re-spray uniformity** among regions and provide a methodology whereby both forester and pilot could evaluate performance on a given tract. With positive responses from both the field and our contractors, we will plan to continue this same system in 1993.

While at a Southern Weed Science Society meeting, an ex-congressional aide unsympathetic to herbicide usage referred to the 800 people in her audience as "**nozzle heads**". The speaker that followed represented a chemical company and began his presentation by stating that he had finally developed a definition for the word politics. He broke the word into parts and explained that "poly" means many and "tics" are blood sucking creatures! Laughter and applause could be heard among the gathered nozzle heads.

Rather recently we got copies of the **"Proposed Guidelines for Management of Red-cockaded Woodpecker on Privately Owned Land"**. If one of the things that makes this country great involves private landowner rights, lookout! While endangered plants on privately owned land belong to the landowner, critters belong to the state and, as such, are subject to the full implications of the endangered species legislation and the resultant regulations that are promgated to enforce the legislation. With plants, there would be a number of cooperative efforts by those concerned to work with a landowner in protecting a listed plant. Still, the landowner has the final say. Obviously, from reading the proposed guidelines mentioned earlier, such a cooperative atmosphere will not exist where listed animals are involved.

At this writing, a legislative group in **North Carolina is looking into forestry use of herbicides**. Unlike Virginia, there are no use data available for forestry operations in North Carolina. Groups/individuals opposed to use of these materials are making their own use estimates and they are, of course, worst case scenarios. We may use Virginia data to help answer some North Carolina concerns, but it will not be as adequate as if North Carolina had their own data. We continue our interest in the development of forestry use data in states other than Virginia, but progress is slow. Renewed interest and backing from the Auburn University Silvicultural Herbicide Coop will help. If we can now enlist the support of the Southern Group of State Foresters, we'll be off and rolling.

Interest in **dogwood anthracnose** continues. 1993 funding will permit remeasurement of approximately 30 semi-permanent plots established in counties where the disease has been identified. On the downside, we have been told that 1993 will be the final year for funding this effort.

In the **unusual request category**, this issue's winner came from a lady who asked us to freeze dry a copperhead for her. She runs a summer camp for kids and wants to use the specimen as an educational tool for youngsters at the camp. It seems like a good cause; we agreed to do it.

For the most part, area foresters submitted their "Record of Pesticide Use" form 6.130 on time during 1992. There were some stragglers; data from late submissions will be included in 1993. Just a reminder that these forms will be used again in 1993 and area foresters are urged to fill them out as projects are completed rather than waiting until fall when we ask for the forms. We need use information on all projects except those involving our aerial contracts and efforts directed toward seedling protection from reproduction weevils.

Just when we think we are all up to date regarding pesticide certification, I learn of several more individuals who, upon receiving their renewal notice, thought it was junk mail and trashed the letter. Those we learned about most recently will be required to retake the examinations in order to become certified again. Please remember that some time in the spring before June 30, you will receive a renewal notice from VDACS. **IT IS NOT JUNK MAIL!** The form will require your signature and return of the form to VDACS. With that done, your certification will continue until June 30, 1994. The renewal notices will be sent to your home address.



PEST WATCH

| PEST/CONDITIONS | EVIDENCE | REMARKS |
|------------------------|---|---|
| Rust Fungi | Orange/yellow sporulation on the evergreen host | Report unusual finds |
| Red Bud Canker | Branch mortality | Remove effected branch below canker |
| Sycamore Anthracnose | Leaf fall/twig die back | Easily confused with frost damage |
| Dogwood Anthracnose | Foliage/twig mortality beginning in the lower crown | Media coverage will make phones ring |
| Beech Bark Disease | White cottony masses on lower main stem | Report any suspected finds |
| Spring Defoliators | Eggs; feeding; rolled leaves; tents | Report major species and any unusual activity |
| Frost Damage | New tissue dead | Report significant occurrence |
| White Pine Weevil | Infested terminals | Spray in late March or prune out in May |
| Pales Weevil | Seedling bark chewed | Check in May; report heavy damage |
| Mites | Gray-green stippled foliage | Spray promptly if control desired |
| Southern Pine Beetle | Pitch tubes; fading crowns | Remember quarterly reports |
| Bagworm | Old bags | Treat, if desired, when new bags tiny |
| Hemlock Woolly Adelgid | White cottony masses on twigs | Report new infestations; spray ornamentals |
| Pine Shoot Beetle | Tunneled lateral shoots, especially Scotch pine | Report and send samples |

PEST PRIMER SECTION

BEECH BARK DISEASE

Unless you attended school or worked in the Northeast, you've probably never heard of this disease. Still, it represents an interesting insect/fungal complex and we may all be hearing more about it in the future. In 1981, a survey for this complex in West Virginia showed about 70,000 acres of involvement but far enough from Virginia that we believed we were safe for a while. That West Virginia survey was redone in 1992 and results indicated expansion of the original area to now include 624,000 acres. We surveyed the suspect area in Highland and Bath counties. We found the fungus in Highland county close to West Virginia, and the insect can be found in the western third of that county. Neither scale nor fungus was found in Bath county.

The disease begins when beech stems are infested by the beech scale, Cryptococcus fagisuga. There is one generation a year. Adults lay eggs in mid summer; crawlers generally hatch in August and September. The second instar generally occurs in late fall and the insect normally overwinters in this stage. Adults would be present the following spring/summer and the one year life cycle is complete. Once crawlers settle down, their stylet pierces bark tissue and the insect feeds from within parenchyma cells beneath. This insect is one of the wooly scales and it's presence is often evidenced by the white waxy secretion. Cells that are being fed upon shrink on drying and minute cracks develop in the bark and underlying phloem tissue. These cracks pave the way for the next player in this complex.

The cracks/wounds become infection courts for invasion by the beech bark fungi, Nectria coccinea var. faginata or N. gallegina. With successful establishment by the fungus in living bark tissue and peripheral sapwood, lesions or cankers are formed. Generally, each canker is no larger than 1 - 2 centimeters in diameter. For the fungus to cause host mortality, the coalescence of a large number of individual cankers is required. The number of separate infection courts is dependent on the severity of the preceding scale infestation.

The asexual spores formed by the fungus during summer and fall are well adapted for wind dissemination. The sexual spores generally mature in the fall and are dependant upon moisture for discharge. Wind and splashing rain seem to be the major agents in dissemination of the sexual stage.

Accounts from Europe indicate the fungus was active there on beech as early as 1848. In North America, the disease was first identified in Nova Scotia about 1920. The insect, however, had been identified some thirty years before in the same area. The idea of an insect/fungal complex was not advanced until sometime between 1914 and 1930. Prior to this, the insect was given credit for being the sole causal agent. In 1932 the disease was discovered in Maine and Massachusetts where the scale had been found in

1929. Presently, the disease is active throughout the beech areas of Nova Scotia, the Maritime Provinces, the New England states, eastern and central New York, northern Pennsylvania and, most recently, in West Virginia.

Save salvage and TSI aimed at reducing the beech component of stands, control of the complex in the forest situation is tough. Two insect predators have been identified feeding on the scale and one parasitic fungus with the neat name of Gonatorrhodiella highlei has been found parasitizing the scale. As far as I know there has been little work done with these or other organisms regarding the possibilities for biological control.

It does not seem that cold weather poses any problem to the scale except for temperatures below -35 degrees C. The waxy secretion must provide ample insulation. On the other side of the temperature coin, perhaps warmer temperatures will be the limiting factor as this complex moves south and west.

CARE OF YARD TREES - No. 3

In the last two issues of the *Pest Report*, we began this subject and covered some problems from planting to about age 40. The final part of this subject involves care for those specimens aged 40 - 80 years and beyond.

An assumption we must begin with involves your original choice of species at planting time. Numerous species will do quite well to 80 years and beyond, but some like birches, willows, plums, boxelders and others will likely begin a serious decline during this time span because they are generally short-lived species to begin with.

Even species that normally are long-lived can begin to show decline problems because many urban sites simply do not provide ideal growing sites. It therefore becomes the site itself that will not allow some trees to become large and old.

The branch dieback that is common in older trees is often due to root damage or trunk wounds. Roots are easily severed from digging or construction work, smothered from earth fill or insulated by some material accidentally or purposely poured on the yard. Remember the root system now covers a large area and the source of damage may even be an adjacent property. As the tree gets larger, the zone of protection around the tree must increase accordingly. If the protective zone is periodically enlarged, that may be the single best bet for avoiding root and trunk damage.

Dead or broken limbs should be removed both for safety and aesthetics. Removal of that material should be by the three-cut method described in an earlier issue of the *Pest Report*.

A dead branch here and there over a long period of time should not be of great concern. If, however, dead limbs appear almost yearly, this may indicate a more serious situation and, removal of dead limbs does nothing to cure general decline problem.

If a tree becomes too large for the surroundings, live limbs may be carefully removed by cutting back whole branches to the next larger limb or trunk. This should always be done in such a way so as to maintain the general shape or appearance that you find desirable. While it is often cheaper and easier to simply top the tree or remove all major branches to stubs, these techniques generally create more problems than they solve. When this becomes your only alternative, consider total removal.

Understandably, senior trees, those in excess of 80 years of age, are not a common component of the urban forest. Certainly individuals can be found, but rarely does this occur without there having been a long standing commitment to care of these individuals.

Realizing that the care and maintenance of these older specimens may be extremely expensive, ask yourself some questions before you start spending money. Are there people or property at risk if the tree falls? Has the tree been steadily losing foliage or branches? Are leaves smaller than normal? Has the rooting area been seriously disturbed? Is there extensive trunk decay or loose, falling bark? A yes answer to any of these questions would tip the scale against keeping the tree.

The question of root and heart rot is difficult to assess. I recall a large, old oak on my lot that, while it may have been an architect's dream, it was a homeowner's nightmare! This individual was close to the house and was little more than a living shell of sapwood that surrounded a massive hollow trunk. Still, the crown looked pretty good.

High value, older, sound trees may benefit from the removal of competitive turf grass under the crown, and replacement with mulch, woody shrubs or groundcovers. Adjacent lower value trees may be eliminated. Walks, drives or other hard surfaces nearby may be carefully removed. Concentrated foot traffic over the roots might be consolidated or rerouted. Appropriate applications of fertilizer may also help.

In looking at yard tree problems over the years, it is always interesting in that the owners constantly want to know what insect or disease is causing the problem. Except for things like southern pine beetle in the conifers or vascular wilt diseases in the hardwoods, it is rare when an insect or disease is the primary cause of the problem. More often than not, it is something that you or I did, consciously or unconsciously, that began the problem. While I never cease to be amazed at what some trees will tolerate, I am just as amazed at the seemingly minor insult that may tip the balance toward declining tree health.

So, plant them properly, invest in routine maintenance during the early and later

years, be mindful of the effects of what you do in and around the individual and, with luck, it will increase the value of your property and help cool your home. And, when it's all over, like for the big oak tree in my backyard mentioned earlier, it will help heat your home.

SWAMP PINK



With the latin name Helionias bullata, this is one of Virginia's endangered plants. Known only from Nelson, Caroline, Henrico and Augusta counties, it is extremely rare in Virginia. When found, it is generally along small water courses, close to springs or in other areas where exacting water conditions occur. It does not tolerate ground subject to very much flooding. The plant is vulnerable to damage from logging, road building, trampling and drainage.

The plant is a perennial herb. Leaves are basal, oblanceolate, evergreen and stem from a hard tuberous rhizome. The stem can grow to about 36 inches when flowering and is hollow. The pink flowers are born at the top of the stem; they are fragrant and form a dense raceme.

This plant occurs in isolated coastal plain sites from New Jersey to Henrico county, Virginia. In the Appalachian mountains, there are scattered sites in northeastern Pennsylvania, Augusta and Nelson counties, Virginia and border areas of Georgia, North Carolina and South Carolina. The species once occurred on Staten Island, New York, but is has not been found there since the 1880's. During a plant count in Virginia in 1987, 15,450 individuals were tallied.

Habitats are permanently wet with distinctly acidic, usually organic, soil or black

muck. Although tolerant of sun, it is usually found in shaded habitats.

Population maintenance is predominately by vegetative production of new rosettes rather than by seed. In one population, less than 6% of the plants produced flowers. When seeds are formed, dispersal is poor (8 - 10 in.) from the parent plant. The swamp pink is federally listed as threatened. The species was listed in Virginia as endangered by action of the 1989 general assembly.

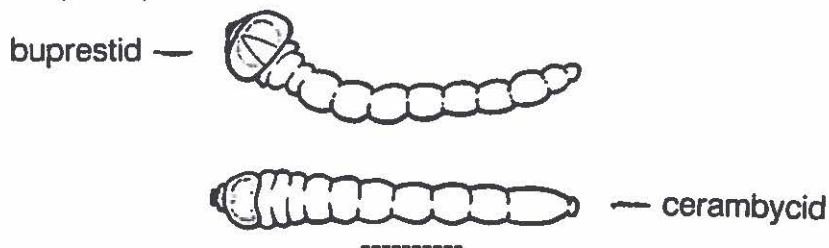
FLATHEADED BORERS

Last October's *Pest Report* covered two important species of roundheaded, or longhorned beetles. Now let's consider the flatheaded, or metallic borers (family, Buprestidae). The larvae of these beetles are distinctive in having an abruptly widened and flattened head end. Adults are often of shiny, iridescent metallic colors and tend to be most active in open, sunny areas. Most species infest the inner bark and sapwood of boles, branches and roots; some are leaf miners. Both hardwoods and softwoods are attacked.

Foresters should be familiar with the twolined chestnut borer, *Agrilus bilineatus*, because it is considered to be a major factor, along with shoestring root rot, in the decline and death of oaks defoliated by the gypsy moth. Larvae of this buprestid grow to be about an inch long and form irregular, winding galleries in sapwood and inner bark, often starting in the crown. At high densities they can girdle the stem. There is generally one generation per year, but host condition influences the rate of development so that larvae can be present at any time. This is usually the first borer to infest stressed oak trees and may attack the same tree over two or three years if death occurs gradually. Vigorous trees can resist infestation.

Hemlock borer is another buprestid that should become abundant in places where adelgids are causing hemlock decline. It, too, is affected significantly by host condition. Invading larvae will die in vigorous hemlocks; they develop most rapidly in trees with diseased root systems.

Since declining trees are attractive to many pest organisms, flatheaded borers are often found in association with other pests. Woodpeckers, predacious beetles and parasitic wasps help keep borer larvae in check.



THINNING AND SOUTHERN PINE BEETLE

SPB outbreaks always raise the question of whether or not to thin when beetle infestation seems imminent. This is not a simple issue. There are no good data that allow us to predict what will happen under particular circumstances. What follows is a combination of professional opinions.

Since volatile substances from cut and injured pines are at least mildly attractive to beetles, thinning does pose some immediate risks. The degree of risk is influenced by how heavily and carefully a stand is thinned, by the proximity and density of beetles and by the weather. Risk should be much lower in the dormant season than in mid-summer. As a general rule, if you can thin during the dormant season, do it.

In places where thinning is relatively easy to arrange, there is little harm in waiting for an outbreak to subside before treating the stand. Summer thinning could invite infestation and the benefits of treatment would not accrue quickly enough to reduce stand susceptibility during the course of an outbreak.

In cases where the opportunities for thinning are limited, it's a gamble. If, for example, this were a once-in-a-rotation opportunity, go ahead and thin regardless of circumstances; it's worth the risk.

The real lesson in all this is one that the SPB has been giving us over and over: thin between outbreaks. Who's listening?

PESTICIDE REVIEW

ESCORT

Escort herbicide contains the active ingredient metsulfuron methyl. Like Oust, it is one of the herbicides in the sulfonyl urea chemical family. It is formulated as a 60% dry flowable. Application may be made by ground or aerial equipment; like many of the newer products, use rates are in terms of ounces or less per acre. Under another product name, the active ingredient is widely used in traditional agriculture, primarily soy beans I think.

The Escort label deals with non-crop (industrial) weed control, site preparation/release forestry applications and spotgun soil application for control of multiflora rose.

Escort is taken up by foliage and roots of both sensitive and resistant species. Selectivity is based on the plant's ability to metabolize the active ingredient. Sensitive plants show little or no metabolism while resistant plants rapidly convert the product into inactive compounds.

It has low toxicity (category III) for acute dermal and primary eye irritation and is even less toxic (category IV) for all other forms of acute toxicity. It has been shown to be not oncogenic (rats or mice), teratogenic (rats or rabbits) and mutagenic. The active ingredient is classed as practically non-toxic to birds, fish, invertebrates and honey bees.

The mode of action involves inhibition of plant cell division and thus cessation of growth. The active ingredient blocks formation of a specific enzyme found only in plants. Without the enzyme, there is no target of activity in mammals which helps to explain the extremely low associated toxicity.

Our interest in this product began some years ago when Roundup was the primary release produce. We tested the addition of Escort in the hope of increasing activity on species such as red maple. Escort has a relatively narrow spectrum of woody plants on which it is efficacious, but Roundup alone was notoriously weak on some where Escort showed a promise. The Escort label lists ash, aspen, blackberry, cherry, elm, multiflora rose, elder, oak, black locust, red maple and cottonwood. Another problem species, kudzu, is included in the Escort label, but 3 -4 ounces of product are needed per acre; things could get expensive rather quickly.

Now, with the addition of Arsenal AC to our forestry products, interest has shifted somewhat to possible use of Arsenal AC/Escort mixes. Two of Arsenal AC's weaknesses involve blackberry and black locust. If, during release, we could substitute Escort for Accord, we could pick up troublesome species where needed and greatly reduce the amount of product that our contractors had to carry. If such a mix were possible, there would be no need for any 30-gal. drums. The Arsenal AC would be transported in 2 1/2 gal. containers and the Escort in 3 pound containers. On the downside, we have tried Escort in mixes with Arsenal AC up to 1 oz. per acre. Results seem good in some places, but not in others. Going above the 1 oz. per acre rate for Escort causes some

"economic heartburn". In addition, there are some mixing problems with Escort. One pilot, working in Florida, told me he had to allow the agitator on the nurse truck to run all night long or the product would settle out and was difficult to re-mix. Also, even though only small containers would need to be carried by our contractors, neither of those containers would be easily recyclable given today's situation. While the Accord 30-gal. drums are somewhat difficult to manage, each is returnable and refillable. In this day and time, that is a major advantage. Another consideration on the negative side is that all products within this chemical family are fairly mobile in the soil and are, therefore, of concern regarding groundwater contamination.

Further south where herbaceous weed control is a major program, Escort has found a good niche. And, it has been adopted by some industrial users as a replacement for 2, 4-D since it does not effect grass. My hope is that industrial and forestry use of Escort continues so that labeling by the manufacturer, DuPont, continues to be worthwhile. While use in Virginia is, at present, minimal, it is a unique product and one we would like to retain for forestry uses.

NEWS ARTICLE

NATURE TEACHES HARD LESSON

An ongoing outbreak of the southern pine beetle illustrates both the importance and the limitations of good forest management according to local forester _____. "Science can help us protect the health of our forests," s/he said, "but some natural events like this are simply beyond our control." When trees are located in the right place and are given plenty of space to grow they can resist most pest attacks, according to, _____. On the other hand, when trees are weakened by old age, crowding, drought or injury then insects, fungi and other pests can take advantage of them.

Normally, the southern pine beetle develops only in weak trees and it isn't a threat to well managed forests _____ says. But when outbreaks occur, the beetles are so numerous that they can overwhelm even healthy trees. Scientists still do not understand fully why outbreaks develop nor why they end because so many factors are involved. "All the interactions among beetles, trees, weather, parasites, predators and other organisms create a very complex picture" notes _____.

Southern pine beetle outbreaks tend to be severe for only two or three years, although they can last up to five years according to Department of Forestry entomologist, Tim Tigner. "This outbreak threatens to be the worst on record," he said. "It is likely to affect most areas of the Commonwealth where pines are a major part of the forest. Landowners who have significant amounts of pine should consult a professional forester for advice."

Since the tiny southern pine beetle spends almost all of its life under tree bark there is no practical way to treat it directly in the woods. Foresters usually recommend that infested trees be cut and removed while the beetles are still in them. This will prevent further damage and allow the wood to be used. Choosing the right trees to cut requires considerable experience and should be left to the professionals.

_____ points out that the southern pine beetle is one more reason to take good care of your trees: "Outbreaks do not effect every pine stand, and the trees that escape will become increasingly valuable. The demand for wood keeps going up, and properly managed forests can bring several times the price of unmanaged ones."

For owners who treat their pine woodland as an investment, the southern pine beetle is obviously a significant risk. Good management can reduce this risk; but when it's science against nature, science often gets the humble pie.

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