# Forest Health Review

November 2009

*A browning forest landscape in Shenandoah National Park during early September due to a large fall webworm outbreak combined with damage from locust leaf miner.*

## In this issue...

# Greetings

After four years of drought, we finally got a break this spring, continuing into early summer. Between April and June, there were more rainy days than I can remember. Entire weeks went by without sun, and I could not have been happier. For the last four years, gypsy moth populations have been on the rise, but that trend finally ended. A particularly wet May continuing into June meant that the gypsy moth fungus, *Entomophaga maimaiga*, was able to thrive during the larval feeding period. It virtually wiped out gypsy moth populations in many locations across the state, as you'll see in the 'Updates' section.

More of our foresters are starting to use their Trimble units to enter forest health ground observations in IFRIS, allowing for more thorough and efficient collection of forest health data across the Commonwealth. If this use continues to expand, in a matter of years we can have a nice database on distribution of invasive weeds and historical occurrence of insect and disease outbreaks on a much finer scale than ever before.

Speaking of invasive weeds – new and exciting developments in biological control of a couple of our worst non-native plants are described in this issue. The southern pine beetle is still around causing problems here and there, but numbers are still relatively low. Emerald ash borer has not been detected outside of Fairfax County this year, although it has spread in other adjacent states. And while the aftereffects of a multi-year gypsy moth outbreak are always impressive, it was the fall webworm that really caught my attention this year. Read on for details. I hope you find this issue to be helpful and informative.

*Chris Asaro, forest health specialist*

# Fall Webworm Outbreak in Shenandoah National Park

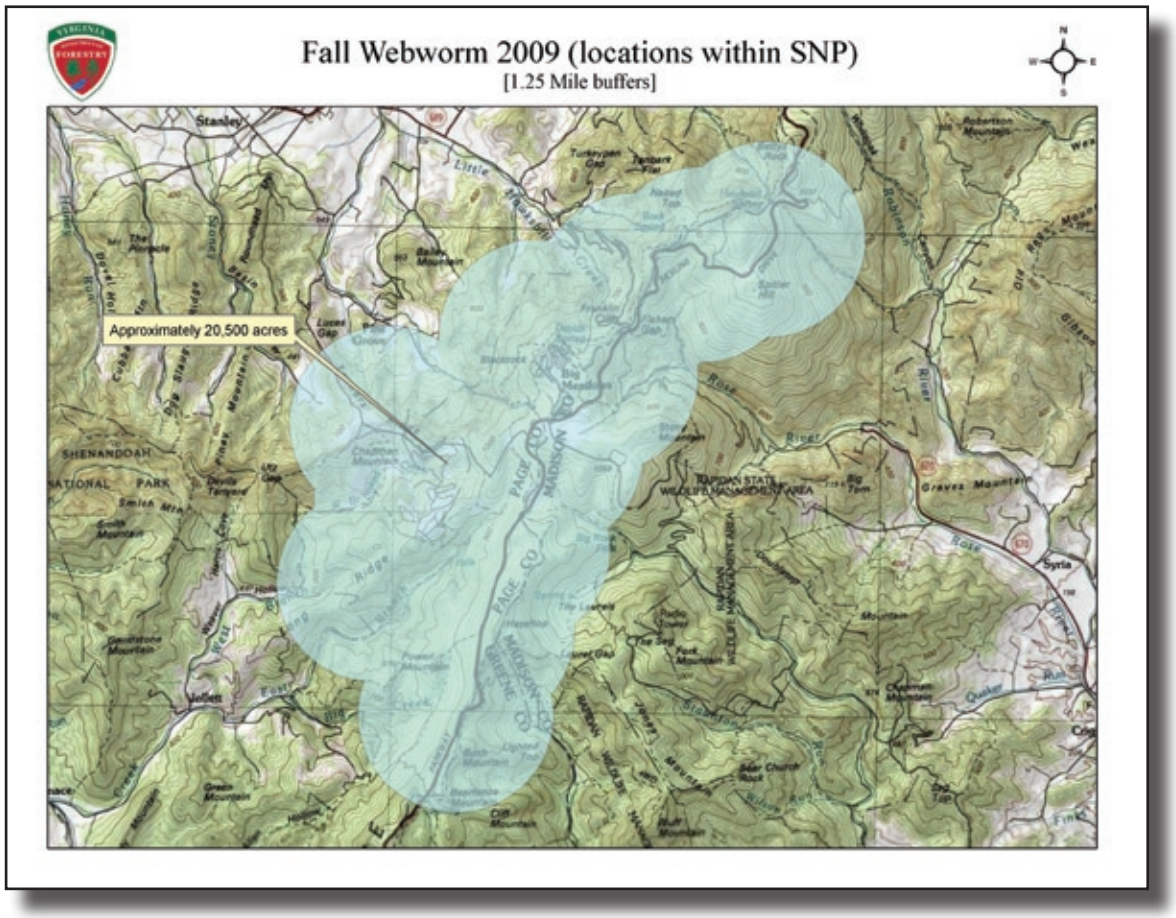
The fall webworm (*Hyphantrea cunea*) is a species of moth and a common late-summer defoliator, primarily of pecans, hickories and walnuts. Typically, by August, it is common to see large webs scattered about the tree canopy, enveloping the foliage around the outer portion of a branch. Most feeding occurs within the web and damage to the tree is limited. Sometimes damage is more extensive and webbing can envelope the entire tree. In general, however, long-term damage is minimal with late-season defoliators because the tree does not try to replace lost leaves by tapping into its energy reserves. Late spring and early summer defoliators can have far greater impacts because, so early in the season, the tree is forced to refoliate and draw on starch reserves normally saved up to get through the winter months.

Therefore, I was quite surprised when I witnessed a massive outbreak of fall webworm in Shenandoah National Park this past September. A very large area along Skyline Drive near Big Meadows

***"A man who reviews the old so as to find out the new is qualified to teach others."***

***Confucius, 551-479 BC***

*Figure 1*




was heavily defoliated (Figure 1). Many trees, most of which were black cherry, were completely defoliated. So excessive was the defoliation in places that, except for the large webs in the trees and the time of year, it looked similar to what one sees with major gypsy moth outbreaks.

I was also surprised to see that the majority of the trees defoliated were black cherry. Although fall webworm is reported to feed on more than a hundred species of trees and shrubs, and host preference can vary by region, black cherry is not listed among its favorites. In the areas I inspected, other species, such as oaks, hickories and walnuts, seemed much less impacted, if at all. At one point, I began to wonder if I was seeing a species other than fall webworm, but examination of the larvae confirmed it as such. Interestingly, many of those areas along Skyline Drive near Big Meadows consisted of forest regrowth following widespread farm abandonment in the early part of the 20th Century. The trees that colonized these sites were made up primarily of black cherry and black locust. Certainly, these two species dominated most of the stands in the vicinity. Black locust, while not impacted by fall webworm, was impacted heavily by locust leaf miner. Although brown locust trees in late summer are an annual event in Virginia due to locust leaf miner, these trees seemed particularly hard hit this year. The combination of locust leaf miner and fall webworm on cherry created a very impressive landscape of brown trees as viewed from some of the overlooks.

I shared my observations with Rolf Gubler, the park biologist, who scouted around other areas that I did not have access to and which were a bit farther removed from Skyline Drive. He reported that there were indeed a variety of other tree species, including oaks,

*"Lucky is he who has been able to understand the causes of things."*

*Virgil, 70-19 BC*

# Fall Webworm Outbreak, continued

hickories, walnuts and ash, that were heavily impacted by fall webworm. These hosts were much more abundant where he was, while black cherry was much less so. I still find it curious that, where black cherry was abundant but other species, such as oak and hickory, were also present, they fed almost exclusively on cherry. That suggests a strong host preference for the latter. Not only was this the first time I can remember seeing fall webworm feeding on black cherry, but it was also the first time I've witnessed a full-blown outbreak of this pest in a natural forest setting and on such a scale. While I don't think the forest will suffer any severe impacts due to some of the reasons stated above, multiple years of defoliation at this level would likely impact some trees. Natural enemies usually keep populations in check, so it will be interesting to see what happens in this location next year.

*Various images of a fall webworm outbreak along Skyline Drive near Big Meadows, Shenandoah National Park. Most of the defoliated trees in the images are black cherry.*

***"Examinations are formidable even to the best prepared, for the greatest fool may ask more than the wisest man can answer."***

***Charles Caleb Colton, 1820***

# UPDATES

## Weather

Notable patterns included the first wet spring in five years, especially May and June. In many locations, this wet pattern extended well into summer. Some weeks during May and June saw rain every single day, and it was at least overcast if not raining for a majority of this period throughout Virginia. However, no tropical systems impacted us this season.

The table below presents the percent of normal monthly precipitation and average degrees above (+) or below (-) monthly average temperature for each of nine geographic regions in Virginia (defined below). For monthly temperatures, a '0' indicates average.

A hail storm in June defoliated almost 400 acres along Rt. 211 and the New Market Gap crossing over Massanutten Mountain. From the air and from the ground at a distance, it looked like gypsy moth defoliation. A closer inspection, however, revealed flagging damage to all hardwoods, pines, shrubs and other plants. Slits in the bark along twigs and branches indicated

*Hail damage to oaks near the top of Massanutten Mountain.*

| | SW | CW | NW | NP | CP | SP | NCP | SCP | ES |
|---|---|---|---|---|---|---|---|---|---|
| **APR. Precip** | 70 to 90% | 70 to 130% | 70 to 130% | 100 to 130 % | 50 to 130% | 50 to 100% | 50 to 130% | 25 to 90% | 50 to 100% |
| **APR. Temp** | -2 to +1 | -1 to +2 | -1 to +1 | +1 to +3 | -1 to +4 | -1 to +1 | -1 to +2 | 0 to +2 | +1 to +3 |
| **MAY Precip** | 100 to 200% | 100 to 400% | 150 to 200% | 150 to 400% | 150 to 200% | 125 to 200% | 75 to 150% | 75 to 200% | 125 to 150% |
| **MAY Temp** | -2 to +2 | 0 to +2 | -2 to 0 | +1 to +2 | -1 to +2 | 0 to +2 | -1 to +2 | +1 to +3 | +1 to +2 |
| **JUNE Precip** | 70 to 200% | 90 to 130% | 90 to 150% | 110 to 150% | 110 to 200% | 110 to 200% | 110 to 200% | 130 to 200% | 150 to 200% |
| **JUNE Temp** | 0 to +2 | 0 to +2 | -2 to +2 | 0 to +2 | 0 to +2 | 0 to +2 | -2 to +2 | 0 to +2 | -2 to +2 |
| **JULY Precip** | 90 to 150% | 100 to 150% | 80 to 110% | 50 to 70% | 50 to 90% | 70 to 110% | 60 to 130% | 60 to 130% | 40 to 70% |
| **JULY Temp** | -2 to -6 | -2 to -5 | -2 to -5 | 0 to -4 | -2 to -5 | -2 to -5 | 0 to -4 | -2 to -4 | -2 to -4 |
| **AUG. Precip** | 70 to 175% | 70 to 120 % | 70 to 140% | 60 to 130% | 60 to 100% | 90 to 175% | 50 to 120% | 70 to 300% | 150 to 300% |
| **AUG. Temp** | 0 to -3 | 0 to +2 | -2 to +2 | +2 to +4 | 0 to +4 | 0 to +2 | +2 to +5 | +2 to +4 | +2 to +4 |
| **SEPT. Precip** | 90 to 130% | 70 to 130% | 50 to 100% | 50 to 70% | 50 to 100% | 50 to 100% | 50 to 130% | 90 to 150% | 110 to 150% |
| **SEPT. Temp** | -2 to +2 | -2 to +1 | -3 to 0 | -1 to 1 | -2 to +2 | -1 to -2 | 0 to -3 | 0 to -2 | -1 to -2 |

**SW** = Southwest (Cumberland gap to Abingdon to Blacksburg and Galax)
**CW** = Central West (Roanoke to Staunton)
**NW** = Northwest (Staunton to Winchester)
**NP** = Northern Piedmont (Loudoun/DC to Greene/Spotsylvania)
**CP** = Central Piedmont (Albemarle/Goochland to Bedford/Nottoway)
**SP** = Southern Piedmont (Campbell/Lunenburg to Henry/Mecklenburg)
**NCP** = North Coastal Plain (King George/Northumberland to Chesterfield/Newport News)
**SCP** = South Coastal Plan (Dinwiddie/Brunswick to Virginia Beach)
**ES** = Eastern Shore

*"It takes two to speak the truth – one to speak, and another to hear."*

*Henry David Thoreau, 1849*

# UPDATES

areas of impact of hail stones. Sometimes this damage can look similar to that caused by periodical cicadas, which make slits in the bark with their ovipositor to lay eggs, resulting in flagging. In that case, however, the slits are more evenly spaced and linear than what was found here. I also bumped into a local who confirmed there had been a hail storm in the area recently. Other severe weather included a small outbreak of tornados in Campbell County in mid-July. Approximately 100 acres of oak, pine and poplar were reported destroyed.

*Impact of hail stones causes slits along twigs and often results in flagging.*

*Hail damage in the foreground and background.*

*"Get your facts first, and then you can distort them as much as you please."*

*Mark Twain, 1899*

*Hail damage to pines near the top of Massanutten Mountain.*

## Gypsy Moth

Wet spring weather led to a significant decline in gypsy moth populations due to the effectiveness of *Entomophaga maimaiga* under these conditions. Statewide defoliation levels had been steadily rising since 2005, with each successive year producing another dry spring. Last year's total defoliation was more than 112,000 acres of mostly heavy defoliation. This year, we were down to 29,000 acres of defoliation, most of which was classified as light (Figure 2).

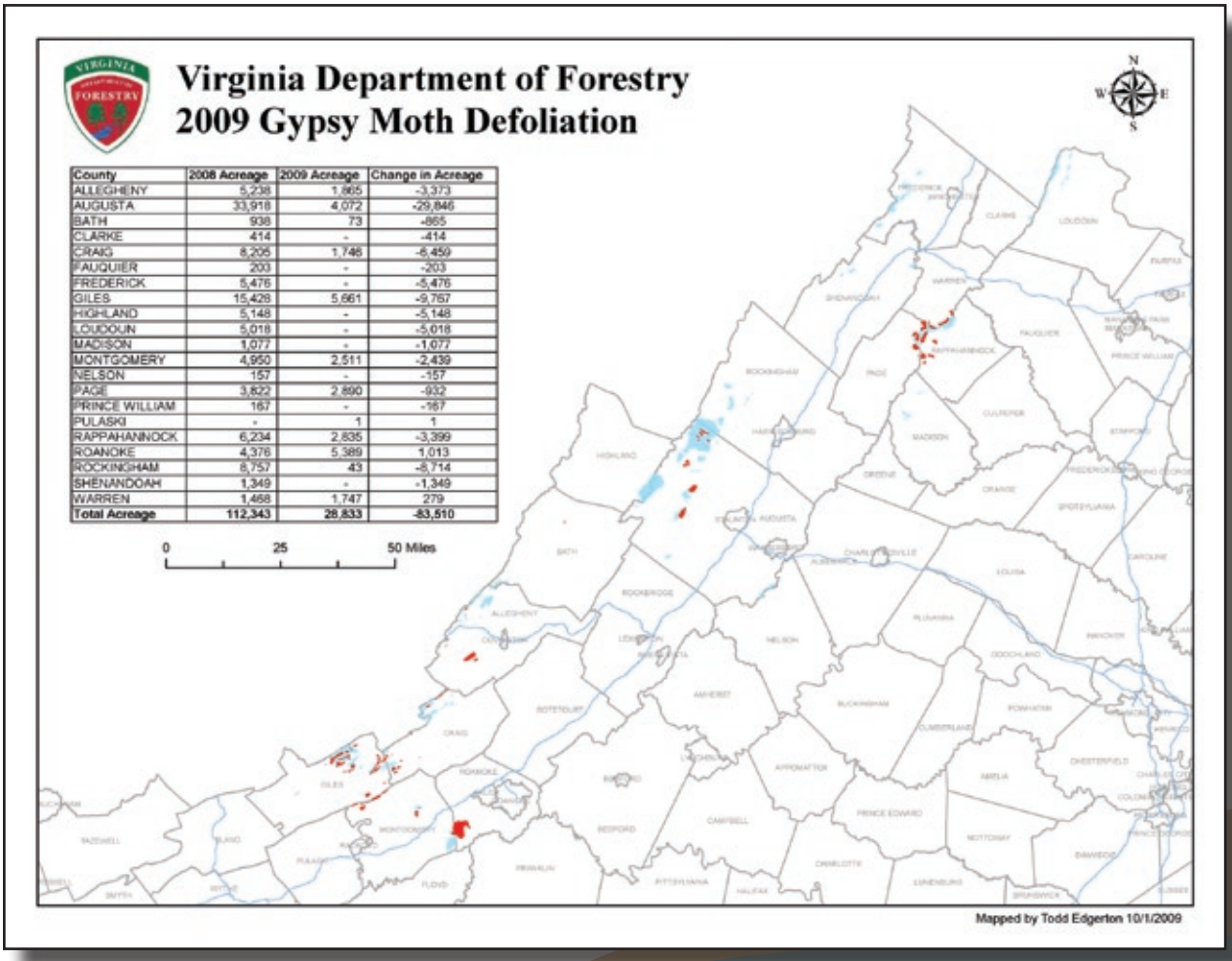
It's worth noting that, while *Entomophaga maimaiga* can be very effective at killing larvae, this usually does not occur until larvae are almost mature and have finished feeding. Therefore, the fungus typically does not stop defoliation from occurring the same year it becomes active. However, by preventing those larvae from becoming adults, mating and laying eggs, few egg masses will be around for next year, when the real impact of the fungus will be seen.

That said, with so many egg masses going into this year, it was surprising to see such a dramatic drop in defoliation acreage and intensity so quickly. In fact, defoliation initially seemed like it was going to be pretty bad. By mid-June, I was starting to get a number of

calls from foresters reporting anywhere from 70 to 90 percent defoliation levels in some locations. All indications were that, despite the rain, we wouldn't see the benefits of it until next year. What happened, however, was it just kept on raining, through June and beyond. Normally, I begin to survey for gypsy moth in mid-June, when maximum damage from the air becomes fully apparent, and finish around mid-July. During this time frame, foliage does not change much from the air. By August however, refoliation of many trees begins to occur (at least among those still healthy enough), and brown areas start to appear light green again. This year, because of the incessant rain, green up began as early as late June. By the time I flew most areas, including those that initially appeared to be heavily defoliated, they were greening up again. From the air, it was quite often difficult to make out whether there was even anything going on; when defoliation was present, it often could only be classifed as 'light'. To all appearances, even trees that were heavily defoliated this year were able

*After four years of heavy gypsy moth defoliation, oak mortality reached catastrophic levels on Poor Mountain near Roanoke.*

*Figure 2*




| County | 2008 Acreage | 2009 Acreage | Change in Acreage |
|---|---|---|---|
| ALLEGHENY | 5,238 | 1,865 | -3,373 |
| AUGUSTA | 33,918 | 4,072 | -29,846 |
| BATH | 938 | 73 | -865 |
| CLARKE | 414 | - | -414 |
| CRAIG | 8,205 | 1,746 | -6,459 |
| FAUQUIER | 203 | - | -203 |
| FREDERICK | 5,476 | - | -5,476 |
| GILES | 15,428 | 5,661 | -9,767 |
| HIGHLAND | 5,148 | - | -5,148 |
| LOUDOUN | 5,018 | - | -5,018 |
| MADISON | 1,077 | - | -1,077 |
| MONTGOMERY | 4,950 | 2,511 | -2,439 |
| NELSON | 157 | - | -157 |
| PAGE | 3,822 | 2,890 | -932 |
| PRINCE WILLIAM | 167 | - | -167 |
| PULASKI | - | 1 | 1 |
| RAPPAHANNOCK | 6,234 | 2,835 | -3,399 |
| ROANOKE | 4,376 | 5,389 | 1,013 |
| ROCKINGHAM | 8,757 | 43 | -8,714 |
| SHENANDOAH | 1,349 | - | -1,349 |
| WARREN | 1,468 | 1,747 | 279 |
| **Total Acreage** | **112,343** | **28,833** | **-83,510** |

*"Art is meant to disturb, science reassures."*

*Georges Braque, 1917*

# UPDATES

to recover much faster than they normally would have. Although I hate to make predictions, I feel confident that if we see even a normal amount of spring rainfall next year, gypsy moth defoliation could go down to near zero for the first time in five years.

Despite this positive trend, the damage has been done in a number of locations that have seen severe defoliation for the last three to four years. The most prominent example is the Poor/Bent Mountain area just southwest of Roanoke. This mountain, once covered in chestnut oak, has been devastated. Widespread oak mortality is also present within the George Washington and Jefferson National Forest in northwest Giles County, as well as northwest Augusta County and southwest Rockingham County.

## Bark Beetle Activity

Despite an up-tick in activity in Charlotte and Caroline counties, SPB once again seems to be at relatively low levels across the Commonwealth. This is in keeping with our spring trapping effort, which predicted low, stable numbers this year. However, a number of spots that did show up were quite large. In most cases, they were in overstocked pine, but not in every case. Usually the stands are harvested before I get a chance to look at them, or even before I hear about them. Scattered reports of Ips and turpentine beetle have come in from throughout the Piedmont, which is not surprising since these insects are pretty ubiquitous. However, nothing major seems to be occurring with these species either.

## SPB Prevention Program

After approximately five years, the Southern Pine Beetle (SPB) Prevention Program has provided federal cost-share dollars for pre-commercial thinning (PCT) on approximately 25,000 acres throughout Virginia. On July 1, we began a new logger incentive program for first thinning of small parcels between 10 and 40 acres in size. The logger incentive is not a cost-share payment but a direct, fixed payment of $2,000 per job. The rationale for this program is that small parcels are rarely profitable for loggers to travel to; the average cost of moving their equipment to a site is approximately $2,000. Therefore, it is much more difficult to entice a logger to visit a small parcel in need of a thinning. With this incentive, we ensure that the expanding acreage of pine parcels below 40 acres can also benefit from best management practices for mitigating bark beetle impacts. This logger incentive program is being paid for from a Federal Redesign Grant obtained last year. We have been receiving a decent amount of participation thus far, and inquiries continue to come in. We hope that in addition to fulfilling the need for thinning of small parcels, this incentive will provide just enough extra income to keep logging companies going during these difficult economic times.

In July, we hired George Thomas Hendrick (G.T.) to replace Nathan Lojewski as our Longleaf/Southern Pine Beetle Prevention forester. G.T. will continue to help Billy Apperson with all aspects of our longleaf pine restoration efforts (see the Forest Research Review for regular updates on this topic). In addition, G.T. will be

*Jerre Creighton (right), VDOF forest research manager, discusses the longleaf pine provenance test with G.T. Hendrick at the New Kent Forestry Center.*

***"The greater the wealth, the thicker will be the dirt."***

***J. K. Galbraith, 1958***

responsible for conducting landowner education and outreach regarding southern pine beetle prevention methods. He will be working primarily out of the New Kent Forestry Center but will travel throughout the Coastal Plain, particularly southeast Virginia where all of our existing native longleaf is present. G.T. has hit the ground running, but please continue to make him feel welcome.

## Nantucket Pine Tip Moth

The Nantucket pine tip moth (*Rhyacionia frustrana*) negatively impacts the early growth of southern pines more than any other insect pest. The traditional use of insecticides to control tip moth has been problematic due to the need to employ spray timing models. In addition, spraying each tip moth generation (anywhere from two to five throughout the range) over multiple years is impractical, requiring the need for spray schedules. Determining an optimal spray schedule for multiple generations and years has been attempted, but cost-benefit analyses of these practices have been limited and, therefore, industry has not readily adopted them. Furthermore, while insecticide sprays are most effective during spring and early summer, tip moth becomes harder to control during the later generations in late summer and fall due to asynchronous development of life stages. There are also a number of locations throughout the South where generations overlap considerably, even during the spring generation, which confounds accurate spray-timing.

One solution to these multiple problems may be the use of systemic insecticides, particularly if control from a single application can carry over multiple generations and even years. For the past two years, Jerre Creighton and I have been testing the efficacy of two systemic chemicals for control of the Nantucket Pine Tip Moth. The first product – by Bayer Environmental Science – is called SilvaShield, which is formulated into a tablet and consists of the active ingredient imidacloprid. The second product – by BASF – is called PTM, a liquid containing the active ingredient fipronil, which is injected into the root zone. Both products are applied at or close to time of planting. Both products are also showing excellent control of tip moth damage going into the second year. Please consult the Forest Research Review for periodic updates on these research results.

*Severe damage by the Nantucket pine tip moth creates poor form and increases southern pine rotation length throughout the Southeast.*

## Pine Sawflies

A number of counties reported pine sawfly outbreaks. The largest area reported was in Madison County, where as much as 350 acres of mostly Virginia pine was reported defoliated by the Virginia Pine Sawfly, based on examination of larval specimens. Major outbreaks of this species are rare, but one occurring in the mid-Atlantic region during the late 1950s covered an area of about 14 million acres of pine and pine-hardwood type before subsiding. Although only light mortality was reported, growth losses were severe. Natural enemies such as mice, ants, parasitoid insects and a virus keep populations in check or help cause population crashes following major outbreaks.

## Hybrid Poplar Mystery

I don't know much about hybrid poplar plantations, but I do know they are supposed to be a reliable source of fiber in certain parts of the country. As you would expect, hybrid poplar experiences a wide variety of insect and disease pests, but none too serious as to prohibit productive management. This summer, I was asked by a MeadWestvaco forester to look at a 30-acre hybrid poplar plantation

***"Human blunders, usually, do more to shape history than human wickedness."***

***A.J.P. Taylor 1961***

# UPDATES

in Cumberland County, most of which had died mysteriously beginning last year. While I scouted around for a while, I found nothing obvious that might have been the causal factor. Unfortunately, I had few clues to go on. The forester indicated that trees had died the previous year, so already it was a bit late to be making a good diagnosis. If an insect was responsible for the mortality, it was long gone. Meanwhile, these dead trees were likely colonized by a whole host of secondary insects and diseases that had little to do with the underlying problem. There was no obvious site or environmental factor that I could point to either. While the soils were sandy and well drained, and we had been through four years of drought off and on until this year, the MeadWestvaco forester indicated that these sites were similar in soil and elevation to other poplar sites that were doing just fine. In addition, parts of the plantation were still alive, and those individual trees looked just fine, with no signs of imminent decline or death. While I'm not always able to determine an exact cause when it comes to tree or forest mortality, I'm usually able to hazard an 'intelligent' guess. In this case, I can't even do that. I guess for now it will have to remain a mystery. If you have any ideas, please share them with me.

## Emerald Ash Borer

With the extensive trapping effort by VDACS this year in northern Virginia, I fully expected them to find evidence of EAB outside of Fairfax County. I was wrong. While it did spread to a number of new locations within Fairfax County, no new finds were reported in adjacent Loudoun, Fauquier or Prince William counties. On the other hand, despite the fairly dense trapping grid, it would not surprise me if it were somewhere else in the state, because these purple prism traps have limited ability to attract EAB from long distances. In fact, EAB did turn up this year in Morgan County, WV, just north of Frederick County, VA. It was also detected in Kentucky for the first time, but in multiple locations along the interstate corridor between Louisville and Lexington. It's only a matter of time before we find it somewhere else in Virginia, but perhaps our quarantine efforts are helping to slow it down, as intended.

## Mile-a-Minute Biological Control

Mile-a-minute (*Persicaria perfoliata*) is a non-native weed that is slowly invading Virginia from the north, adding to the growing list of such weeds that plague our forests. Biological control of invasive plants has great potential to limit their impacts. Unfortunately, it is difficult to find a suitable biological control that can be safely released into our environment that would not also negatively impact non-target, native plants.

However, a safe and hopefully effective biological control in the form of a weevil from China is available. Based on research from the University of Delaware, the mile-a-minute weevil (*Rhinoncomimus latipes*) has been mass reared and released into Pennsylvania, Maryland, Delaware and most recently, Virginia. This year, through the Virginia Department of Agriculture and Consumer Services, a release was made at each of two locations. The first location was in Hidden Pond Nature Center, owned and managed by the Fairfax County Park Authority, which released 1,000 weevils in May. The other location was on lands owned by the Smithsonian Institute near Front Royal and the northern entrance to Shenandoah National Park, which received 500 weevils.

Monitoring over time will reveal how effective these weevils are. In most locations where releases have occurred, significant spread as well as significant declines in mile-a-minute biomass have been documented. While it is too early to declare success at the two release sites in Virginia, early signs are promising. At one site, weevils appear to have spread

***"An expert is someone who knows some of the worst mistakes that can be made in his subject and who manages to avoid them."***

***Werner Heisenberg, 1969***

hundreds of feet from their original release point, and, in spotty locations, declines of mile-a-minute vegetation are already apparent. There is a long way to go, but combined with additional weevil releases in the future, this may prove an important tool in slowly stemming the tide of mile-a-minute. While it's unlikely the weevil will totally eliminate this weed from the environment, the hope is that it will be put in a competitive disadvantage compared to native plants, which will then be able to reestablish themselves in their natural habitat. Stay tuned for future updates.

## Tree-of-Heaven Biological Control

Exciting developments are occurring in the area of biological control of tree-of-heaven (TOH) (*Ailanthus altissima*), which in my opinion is Virginia's public enemy No. 1 as far as forest weeds go. Two approaches, a TOH-feeding weevil and a root disease called *Verticillium albo-atrum*, hopefully may be combined in the future to provide a one-two punch to help destroy TOH.

The weevil research is being conducted by a student of Scott Salom, professor of forest entomology at Virginia Tech. The weevil must be studied under quarantine until it is determined not to be a threat to any native plants. As with any new biological control, minimal or zero impacts to non-target hosts must be demonstrated to receive approval for release into a new environment. Usually, it must be demonstrated that the biological control agent is incapable of feeding and completing its life cycle on any plant other than the target species. As of now, it appears that the risk to any native North American plants is extremely minimal.

The other side of the biocontrol equation is a fungal pathogen, *Verticillium albo-atrum*, which causes a wilt disease in TOH. This species is being studied by plant pathologists at Penn State University. It has been isolated repeatedly from dying clusters of TOH throughout Pennsylvania. Initial inoculation tests have shown significant disease and mortality in TOH. The usual tests of host range and environmental safety apply here as well, even though the pathogen already appears to be widespread in the environment. Since it would be rather inefficient to manually inoculate every tree, the hope is that the weevil can act as a vector, moving the pathogen around in the process of feeding on TOH. While there is still a long way to go before this is possible, if ever it is, the research thus far gives reason for hope.

## Wavy Leaf Basket Grass

A relatively new invasive weed, wavy leaf basket grass (*Oplismenus hirtellus* spp. undulatifolius) is showing up in a number of locations throughout the Commonwealth and is causing a lot of concern. Its growth and appearance are somewhat similar to Japanese stilt grass (*Microstegium vimineum*), however, the blades are a bit larger and the leaves have a characteristic 'wavy' appearance. It is extremely shade tolerant and seems to take over a site rapidly, virtually excluding native vegetation. Also, unlike stiltgrass, it is a perennial and will overtake stiltgrass when the two are growing together. It produces very sticky seed on long stalks, making it easy for a person walking through an infestation to spread the seed over long distances.

*The 'wavy leaf' pattern is easier to see when foliage is wet.*

*"The city is not a concrete jungle, it is a human zoo."*

*Desmond Morris, 1969*

# UPDATES

*A thick carpet of wavy leaf basket grass setting seed.*

It was discovered in the United States near Baltimore, MD, in the 1990s and has since been found in Virginia. The first location was near Swift Run and Route 33 on the western end of Shenandoah National Park. Efforts are underway to eradicate it using herbicides, but it is a large area. The other known location is on Ovoka Farm near Paris in northern Fauquier County. Both sites are near the Appalachian trail, suggesting it may have been moved by hikers or horses. It has also reportedly been seen in Fairfax County and is likely already pretty widespread in northern Virginia. Be on the lookout for this new exotic so it can be eradicated before it spreads too far.

*A close up of wavy leaf basket grass stalk (raceme) with sticky seed awaiting transport by a passing animal.*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