Southern Forest
Nursery Management Cooperative
Fall 2009

3301 Forestry and Wildlife Sciences Building
Auburn University, Alabama 36849-5418
phone 334.844.1012
fax 334.844.4873

Director's Report

It has been a few months since our last Newsletter and a lot has happened since the release of the revised Re-eligibility Decision (RED) for soil fumigants. With the newly revised rules released in May 2009, EPA and the registrants are working behind the scenes to smooth out the rough edges with respect to Notification, Early Responder and New Label issues. All of this will need to be finalized by the 2010 fumigation season when many of the new rules come into effect. By 2011 all facets of the Rules published in May 2009 will become part of the fumigation process and will also include buffers, GAPs and FMPs. Despite the distraction of the RED this spring and all it entailed, I hope that your seedlings are getting ready to be lifted and outplanted and that you have another productive growing season under your belt. We continue to work on the MBr issue - both CUE and QPS - re-registration of pesticides and evaluation of alternative fumigants, fungicides and herbicides.

Membership

Tom and I have been approached by a couple of nurseries in the southern U.S. about joining the Nursery Cooperative. We have shared our brochure with them and answered a few questions concerning membership. The Nursery Cooperative currently has 16 Full Members and 1 Associate Member.

Advisory Meeting

The Advisory meeting is scheduled for Wednesday and Thursday, November 4 & 5, 2009 at the School of Forestry and Wildlife Sciences Building at Auburn University in Auburn, AL. The Nursery Cooperative staff will begin the process of updating our accomplishments, the budget and next year's work plan. If you have any ideas or items that your organization would like addressed, please let me, David or Tom know. We will begin the meeting after lunch on Wednesday and adjourn around noon on Thursday. We will set up the meeting using video conferencing for those who cannot travel to Auburn. If you would like to get access to the meeting, please call Elizabeth Bowersock at 334.844.1012 and she will let you know what you need to access the meeting. Mark those days on your calendar and look for more information to be available shortly.

Contact Meeting

The 2009 Nursery Cooperative Contact meeting was held June 22-25, 2009 in Daphne, Alabama and was attended by 35 Nursery Cooperative members plus the entire staff and many guest speakers. For those who were unable to attend, we have posted all the presentations on the Nursery Cooperative's web site for you to access. Next year's Contact Meeting will be held in Little Rock, Arkansas at the Peabody Hotel on July 26th, 2010 in conjunction with the Biennial Southern Forest Nursery Association Conference. As is the normal practice, we will have an indoor session of Nursery Cooperative staff presenting their most recent research findings on Monday afternoon and then the rest

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Call Us!

Scott Enebak	334.844.1028
Tom Starkey	334.844.8069
David South	334.844.1022
Marietjie Quicke Tommy Hill Barry Brooks	334.844.4998
Elizabeth Bowersock	334.844.1012
Paul Jackson	334.844.8071

of the week will be the SFNA meeting. More details will be forthcoming with the Spring 2010 Newsletter.

VIF MBr Alternative Watch Trials

Taking research results from one nursery and applying them to another nursery can be a potential problem. While the overall production system may be similar, variation in soil types, weather conditions and cultural practices make broad generalizations of effectiveness difficult. When trying out new products and treatments, the Nursery Cooperative has always taken the position of "try this in a small part of your nursery before you go operational." An example is the small-scale trials Bill Carey and I conducted using chloropicrin and sectagon in the early 2000s. When used in combination, these compounds gave good weed, insect and fungi control as well as good seedling quality, but the nursery community was shocked when outgassing occurred when the combinations were scaled up during a temperature inversion. As a result, this combination has never been tried again without a tarp. Another example involved the application of certain dinitroaniline herbicides. Many nurseries have used these products on hardwoods, but at one nursery an application to sweetberry resulted in stem swellings and brittle seedlings.

It should be no secret to anyone that grows forest nursery seedlings that MBr is currently on a short leash. With that in mind, I propose that Nursery Cooperative members, in cooperation with Hendrix and Dail (H&D), establish some "watch trials." These trials will allow managers to try one of the MBr alternatives under virtually impermeable film (VIF). Applying alternatives at a lower rate might demonstrate three things: 1) The rate under VIF film allows us to continue working under the new EPA REDs (i.e. "workable" buffer zones); 2) The alternative fumigant produces acceptable seedlings; and 3) The operational test might detect an *unforeseen problem.*

H&D has made some modifications to their fumigation rig to address some of the issues that have been raised by EPA concerning the "chimney" effect. H&D has added "beaver tails" to the deep shanks, and paddles to the soil surface to close the chisel traces. Also, H&D's modified rig can change the plastic width (HDLP or VIF) from 10.5 to 13 feet in less than 1 hr (i.e. they only have to transport one rig). Thus, I am asking those that plan on using soil fumigation as part of their seedling production to work through your H&D sales representative to schedule this rig for part (*not all*) of your fall or spring fumigation.

A manager might consider using one or more of the following compounds: chloropicrin, Pic+, or Chlor 60 under VIF at 200 lbs. per acre in one or two nursery sections. Just "watch" and see how well the fumigant and plastic works at your nursery. The new RED rules will take effect in 2011 and the "watch trial" will let you know if you can live with the new system. The Nursery Cooperative staff will not be collecting data from these trials, but we ask that you "watch" them for issues (e.g. weeds, seedling quality, insects or diseases) that may occur in your nursery but have not been noticed in our USDA trials. The last thing your organization needs is, come 2011, to have either wide buffer zones or **no MBr**. What are you going to use?

Pesticide News

MBr Issues

The 2009 CUE application (for 2011 MBr use) was submitted to EPA in early July for the Agency to include in their report to the State Department and subsequent request for MBr from the Parties of the Montreal Protocol. The final amount awarded to Critical Users will be determined by the Parties in November 2009. Expect to pay more per lb. for any methyl bromide used next year.

QPS

There has been no movement from either TN or VA with respect to adopting regulations that would allow the use of MBr through the QPS process. Virginia has the support of their state forester, but the rule needs to be put on the "Top 10" list forwarded to their legislative bodies for approval. Tom Starkey and I will continue to press the issue with those two states so that they can use MBr in their nurseries under the QPS guidelines.

In early July 2009, there was some concern from MBr applicators, APHIS, and USDA that EPA was proposing to eliminate all state, local and tribal uses for QPS and limit MBr for federal quarantine usage only. The use of MBr for non-federal QPS has been a significant point of discourse between the U.S. State Department and the United Nations. Discussions with APHIS, USDA and others (non rule-makers) within EPA have indicated that the new labels are not going to do away with MBr QPS. To that end, in early September, EPA requested that all State Plant Boards forward all rules and regulations that they have pertaining to MBr and soil fumigation to EPA so that they can determine the current uses that would need to be included on the 2010 MBr label. The deadline for states to comply was September 16, 2009 with the new labels due in EPA's office by September 30, 2009.

2009 Methyl Bromide Alternatives in Alabama Forest Tree Seedling Nurseries - Update
Marietjie Quicke

The trials for the 2009 Areawide Methyl Bromide Alternatives project are at Joshua Timberlands Nursery in Elberta, AL and Weyerhaeuser's Pine Hill Nursery in Camden, AL. Elberta's fumigation was on October 22, 2008 while Camden's fumigation was on March 24, 2009. The soil fumigants and rates used at each nursery are listed in Table 1.

Experiments and Measurements
A four-acre trial was established at the Joshua Timberlands nursery using a randomized complete block design with soil treatments replicated four times. Each of the seven treatments was 16 ft x 280 linear bed feet (Table 1). The other study site was established on five acres at the Weyerhaeuser nursery and used two nursery blocks with six treatments that were replicated four times in a randomized complete block design (16 ft x 260 ft) over 3.6 acres. The soil fumigants at each nursery were shank injected and covered with a 1 mm high-density polyethylene tarp (Cadillac Plastics Inc.) per label recommendations. In another nursery block (1.4 acres) at Camden, two treatments of iodomethane (Midas™) were applied, replicated four times and covered with virtually impermeable film (VIF - Ginegar) as broadcast/flat tarp. Each nursery sowed a single family of loblolly pine (*Pinus taeda*) in mid to late April 2009 and will be followed over two pine seedling crops. Final seedling densities and seedling quality will be determined at the end of each cropping season (2009 and 2010).

Results and Discussion
Six weeks post sowing, seedling counts at both nurseries had no differences in the number of seedlings per square foot among the 7 different soil fumigants tested. Camden seedling densities were within their target seedling numbers of 21 seedlings/ft². However, due to heavy rainfall at the Elberta nursery, the seedling densities were below the nursery target of 17 seedlings/ft² (Table 2).

At the Camden nursery, the analysis of the soil resulted in no difference in *Trichoderma spp.* levels among the soil fumigants. In the iodomethane trial, the Midas™ 50/50 had significantly higher levels of *Trichoderma spp.* than the Midas™ 98/2 (Table 2). This difference in *Trichoderma* between these two products could be due to the amount of chloropicrin used. Previous Nursery Cooperative research has shown that 100% iodomethane is detrimental to soilborne *Trichoderma spp.* when compared to other soil fumigants. At Elberta the DMDS + chloropicrin treatment had significantly higher levels of *Trichoderma spp.* than soils fumigated with chloropicrin. Soils fumigated with methyl bromide fell between the two extremes. Although soil samples were collected pre- and post-fumigation, nematodes were not recovered from any fumigated soil treatment at six weeks post sowing.

Table 1. Fumigants and rates used in 2009 Areawide demonstration plots.

Fumigant	Rate	Nursery*	Components
MBr #1	400 lbs/acre	E	98% MBr + 2% Chloropicrin
MBr#2	235 lbs/acre	E	98% MBr + 2% Chloropicrin
DMDS+Chlor	70 gal/acre	E,C	79% DMDS + 21% Chloropicrin
MBrC 70/30	400 lbs/acre	E,C	70% MBr (98/2) + 30% Solvent A
Pic+	300 lbs/acre	E,C	85% Chloropicrin + 15% Solvent A
Chloropicrin	300 lbs/acre	E,C	100% Chloropicrin
Chlor 60	400 lbs/acre	E,C	60% Chloropicrin + 40% 1,3-D (Telone)
MBr	350 lbs/acre	C	67% MBr + 33% Chloropicrin
Midas™ 50/50	160 lbs/acre	C	50% Iodomethane + 50% Chloropicrin
Midas™ 98/2	100 lbs/acre	C	98% Iodomethane + 2% Chloropicrin

*E=Elberta, AL; C=Camden, AL

20 Years Ago...

What were the concerns of the Southern Forest Nursery Management Cooperative in the Fall 1989 Newsletter?

There were 30 members in the Nursery Cooperative. New studies included weed control in hardwoods, Viterra/Benomyl root dip, sedge control, and a demonstration of precision sowing. Research reports included "The Effects of Nitrogen on Early Field Performance" and "Cover Crops Affect Residual Weed Populations." Du Pont reported the contamination of Benlate 50 DF with low levels of atrazine. The Newsletter section "News from Members" found some familiar names: John Pait (CellFor) was named to a new research position with Container Corporation; Allan Murray (AFC) was named assistant nursery manager at the Baucum, AR nursery; Harry Vanderveer (former TFS) was hired by IFSCO to manage the Buena Vista, GA nursery; Ken McQuage (Plum Creek) was hired by International Paper as nursery specialist for their Blenheim, SC nursery. David South had just returned from a sabbatical in Scotland. The Nursery Cooperative had just purchased its first fax machine. The staff of the Nursery Cooperative included Walt Kelley (Director), John Blake, Harry Larsen, Ken McNabb, Brett Runion, David South, Nancy Stumpff, Tommy Hill, Andy Barnes and the secretary, Linda Kerr.

The use of iodomethane at the Camden, AL nursery was one of the first large-scale broadcast trials using Midas™ under virtually impermeable film (VIF). However, the ability to glue VIF at Camden, AL presented logistical problems that still need to be addressed. The two Midas™ treatments took five hours to glue 1.4 acres of VIF (0.28 acre/hr). At this rate, a normal 20-acre field would take 7-10 days to fumigate. In contrast, using high density plastic with the other six soil treatments on 3.6 acres took four hours (0.93 acre/hr) to apply.

Table 2. Seedling densities and levels of soilborne *Trichoderma spp* six weeks post sowing - 2009.

Fumigant	Elberta		Camden	
	Seedling density (#/ft²)	*Trichoderma*[1]	Seedling density (#/ft²)	*Trichoderma*
MBr #1	12 a[3]	10 bc		
MBr #2	14 a	22 ab		
DMDS + Chlor	11 a	32 a	21 a	35 a
MBrC 70/30	14 a	24 a	22 a	36 a
Pic+	12 a	9 bc	21 a	22 a
Chloropicrin	12 a	5 c	21 a	59 a
Chlor 60	12 a	6 c	21 a	26 a
MBr			21 a	82 a
lsd (0.05)	4	14	4	75
Midas™ 50/50[2]			21 a	123 a
Midas™ 98/2			22 a	28 b
lsd (0.05)			10	52

[1]*Trichoderma* = colony fungal units/milligram soil

[2]Midas treatments were analyzed separately due to being physically separate from the other treatments

[3]Within column means followed by same letter do not differ at 0.05 level using Duncan's Multiple Range Test.

David's Den

Hard Freeze Dates in January & February
David South

Reports of freeze injury are coming in again from the lower South this year. Injury to roots has been observed in plantations in Mississippi and reports of injury extend from Texas to South Carolina. Low seedling survival (in the 50% range) has occurred in northern Alabama and Mississippi in USDA hardiness zone 7. Some planting sites have less than 33% survival. This planting season, there were two hard freezes in January and one in February. Temperatures at Calhoun, GA dropped to 8°F on January 16th and 17th. On January 21st, it dropped to 15°F and on February 4th-5th it was about 14°F. In Greenville, SC, it was 14°F and 19°F on January 16th and 21st, respectively, and on February 4th it dropped to 16°F. At Holly Springs, MS, and Muscle Shoals, AL, the lowest temperature on January 16th was 10°F. Not only was it cold, but January was the 7th driest on record (since 1895) for the region that includes AR, LA, MS, OK and TX.

The following information for January 2009 is provided by www.sercc.com:

"While mean temperatures were close to normal, the month featured strong swings in temperature as alternating masses of warm and cold air were advected across the area. Most notably, Arctic air swept into the region on January 15th behind a cold front and persisted across portions of the region over the next week. Minimum temperatures reached into the single digits and lower over much of the region, with exception to Florida. The mountainous areas experienced bitter cold temperatures; Mount Mitchell, North Carolina and Burkes Garden Virginia recorded low temperatures of -12 and -10°F (-24 and -23°C) , respectively, on the 16th and 17th. Pelion, South Carolina and Archibold, Florida recorded minimum temperatures of 8°F and 15°F (-13 and -9°C) , respectively, on the 17th and 22nd. Vegetable growers in northern Florida reported significant damage, especially to sensitive crops like bell peppers and tomatoes. Blueberry blooms were damaged by the cold temperatures in southwestern Georgia."

Nursery 101

"Green" Fungicides?
Tom Starkey

Two years ago, the concept of living "green" was new to most of us. Now, even a child in kindergarten is able to tell you what this means. With society's increasing emphasis on living "green," it should come as no surprise that scientists are now talking about "green" pesticides.

Earlier this year, at the American Chemical Society in Salt Lake City, Utah, researchers at the University of Saskatchewan, Canada, described a new class of fungicides called **"paldoxins."** "Paldoxins" is short for phytoalexin detoxification inhibitors.

When a fungus begins the process of infecting a plant, many species respond by producing chemicals called "phytoalexins" as a fungal defense mechanism. However,

many fungi respond in kind by releasing their own enzyme that detoxifies or destroys the phytoalexin, leaving the plant vulnerable to the fungi's attack. Researchers have developed synthetic compounds that interfere with the ability of the fungus to destroy a plant's phytoalexins. Six different synthetic versions of the paldoxins have been created and have been successful in laboratory tests on several crucifer plants, including rapeseed plants and mustard greens. Field tests are planned for other important crops.

Since the paladoxins work in a unique way - disrupting a key chemical signaling pathway that fungi use to breakdown a plant's normal defenses - these new materials are more selective, stopping fungi that cause plant diseases without harming other organisms. These new "green" fungicides could possibly replace conventional fungicides without the threat of fungal resistance, loss of beneficial fungal organisms or other adverse (water, human, toxins) environmental impacts. (*Beyond Pesticides*, March 25, 2009.)

Leadership 101

How to Solve Problems - Part II
Tom Starkey

Problems are things we don't like but are a fact of life. How we deal with them tells a lot about our abilities to be an effective leader.

Robert Harris, on his web site www.virtualsalt.com, describes two approaches that are taken to solving a problem. These are the "Stop It" and the "Mop It" approach. The "Stop It" approach is designed to cure a problem. The "Mop It" approach focuses not so much on the cause, but rather on the effects of the problem, i.e. treating the symptoms. It is always best to investigate the possibility of implementing a "Stop It" approach before focusing on the "Mop It" approach. However, the "Mop It" approach is sometimes the only alternative.

A PROBLEM CAN BE DEFINED AS A DEVIATION FROM A NORM OR STANDARD.

It is easier to focus on the "Mop It" approach, which treats the symptoms, rather than looking for and treating the underlying causes. A good example of the "Mop It" approach are city governments that purchase one-way bus tickets for the homeless and prostitutes just prior to a high profile event in their city.

In 1945, George Polya outlined a 4-step process for problem solving. Since then these have been subdivided, but the basic approaches remain the same:

1. **Understand or define the problem.** Get others involved in describing the problem from their perspective. Ask them to describe the problem in terms of what is happening, where, when, how, with whom, and why. It is best if input is gathered from others individually so people will not be inhibited about offering their impressions of the problem's cause. Do not pass judgment on any idea at this stage. By gathering input from others you will ensure you do not get sidetracked on an issue that may not be the primary concern. List all the known facts and areas that are still unknown. If it appears to be several related problems, try to prioritize the ones you think should be addressed first.
2. **Devise a plan or set goals.** Based upon your top priority assessment of the problem, seek possible solutions from your team. Before going any further, let your list "incubate." Many "eureka flashes" come as a result of people having a chance to think over the problem and list of solutions. Next, write out a statement of the goals you want to accomplish. Be as specific as possible. A good goal is one that is (1) specific, (2) measureable and (3) has a time constraint. A poor goal statement would be "to get seedlings greener." A better goal statement would be "to have greener seedlings in four weeks by applying 1 gal to iron/acre weekly."
3. **Carry out the plan.** Begin to implement the goals developed in the last step. Give the solution sufficient time to work. Remain flexible and be willing to make some necessary changes.

Remember, the focus should be on solving the problem, not mindlessly implementing a set of solutions exactly as proposed.

4. **Look back, evaluate.** Did the solutions work? Do modifications need to be made? Do other solutions need to be tried? Do we need to try a different approach? The most frequent failure of problem solving is the lack of evaluating the implemented solutions.

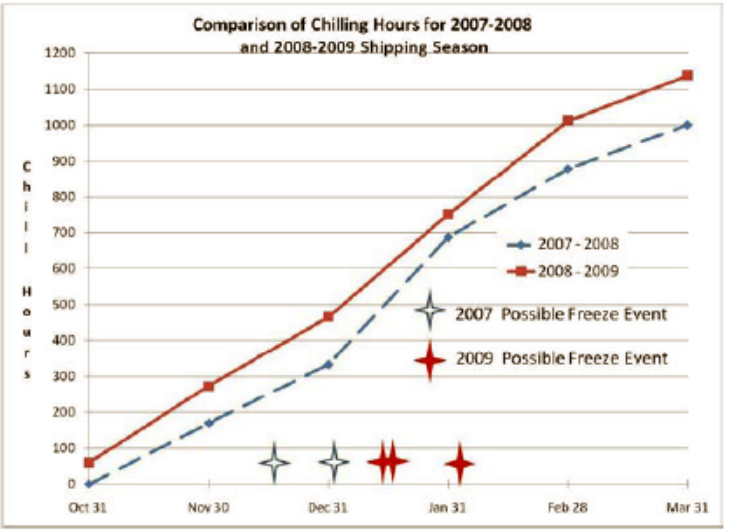
Miscellaneous

What a Difference a Year Makes!
Tom Starkey

In 1959, Dinah Washington made popular an old song "What a Difference a Day Makes." She sings how just 24 little hours can bring sun and flowers where there once was rain. Here at Auburn, in the Nursery Cooperative's Disease Diagnostic Laboratory, a similar tune is being sung. Last year, 2007-8 was a near record-setting year for specimens sent in with freeze damage. What a difference one year can make! This season (2008-9) the seedling samples have dramatically dropped, but they are still coming in.

Hard freeze events do not cause seedling survival issues. There are several factors that determine if seedlings are injured by freezing temperatures. First of all, we believe that certain coastal seedlots are susceptible to freeze (example: 7-56). If seedlings have been acclimated to cold temperatures through "normal" temperature declines, they may tolerate freezing temperatures (to a degree). The primary factor we have seen in recent years that seem to have a major impact is the occurrence of warm night/day temperatures preceding the freeze event. When these occur, Coastal Plain seedlots apparently begin to "wake up" sooner than Piedmont sources. Newly formed plant cells are more susceptible to sudden temperature drops than old cells that have been acclimated to cold.

The following graph compares the accumulated chilling hours for a location in Georgia for the 2007-8 and 2008-9 shipping season. The accumulated chilling hours (< 46°F) for the 2007-8 shipping season were less than 2008-9. By December 31, 2008 there were 133 more chilling hours than one year prior. Also on the graph are symbols to indicate potential freeze events. These points were associated with seedling injury identified by the Nursery Cooperative staff and are characterized as having periods of warm night/day temperatures preceding temperatures



that were below 23°F. There were additional periods in each season in which the temperature dropped into the low 20s, however, these periods were not preceded by warm night/day temperatures and we did not receive any reports of seedling injury.

When not interrupted by warm spells, the number of chilling hours does affect freeze tolerance. However, we cannot make the assumption that increasing accumulation of chill hours equates to freeze tolerance and to protection from freeze injury. When the freeze event occurred around December 18, 2007, the accumulated chilling hours for that year had reached approximately 250 hours. At this same point in 2008-9 the accumulated chilling hours were approximately 380. In the 2008-9 shipping season, the first recognized freeze event occurred on January 16, 2009. Even with a chilling hour accumulation of 600 hours, freeze injury to seedlings occurred this year. Prior to this freeze event on January 16, 2009, the daytime and nighttime temperatures were warm. For the three weeks preceding this event, 75% of the daytime temperatures ranged from 65° - 77°F and 35% of the night temperatures for the same period ranged from 45° - 60°F. These warm night/day temperatures most likely resulted in deacclimation of sensitive seedlots to the effects of freezing temperatures that they normally would not have been affected by had it not been warm.

What we know (or think we know):

1. Chilling imparts some degree of tolerance to freeze injury. The impact may be related to other factors such as seed source and environmental conditions at the site.
2. Nursery Cooperative research has shown that as little as 3-4 nights of warm temperatures can deacclimate family 7-56 to cold temperatures.
3. Freeze events do not always produce injury. The occurrence of warm night/daytime temperatures

preceding a freeze is a factor in seedling injury. In December 1983, numerous reports of seedling injury occurred when temperatures dropped to 5°F. Warm night and day temperatures had preceded this event. In contrast, in January 1985, no reports of injury occurred even though temperatures dropped below to -5°F. Nighttime temperatures preceding this event were generally below freezing.

What we don't know (and wish we did know):

1. What is the relationship between seedling injury, chill hour accumulation and environmental factors, especially soil moisture and photoperiod and seedling freeze injury?
2. What is the best method for accounting for warm periods when accumulating chilling hours?
3. In regards to freeze injury, what is the impact of short periods of deacclimation as compared to long periods of deacclimation?
4. Is this "warm days/nights" more common now or do we have poor memories? Well, we are currently collecting weather records from the southern states going back 100 years to answer that question. We'll know more next spring when all the data is gathered.

Pythium Soil Survey
Paul Jackson

As a component to the seedling cold storage and outplanting survival research, I am interested in knowing how common the pathogen *Pythium* is in nursery soils. Last fall and winter a soil collecting kit was mailed to each Nursery Cooperative member nursery so that soil samples could be assayed for *Pythium* populations. I want to thank you for taking time to send me the Fall-08 (19 nurseries) and Winter-09 (16 nurseries) samples. Overall, about 51% of the samples had no *Pythium spp.* Of the 17 samples with *Pythium*, nine were collected in the fall. On average, a positive fall sample had three times more *Pythium* colonies than a positive winter sample. Based on the soil sampling surveys, *Pythium spp.* is more common in nursery soils during the fall when seedlings are being lifted than in the winter.

Similar to last year, in late October 2009 and in January 2010, I will mail soil collecting kits to all nurseries in the SFNMC. In the kit you will find a box that holds soil samples, an instruction sheet, and postage to return the sample to Auburn University. The instruction sheet will explain in detail the procedure for collecting the soils. I will be analyzing the soils for *Pythium* species, particularly *P. dimorphum* and *P. irregulare*, which have been shown to be pathogenic to seedlings in cold storage. Information from the two sampling years can determine if differences in *Pythium* presence between the fall and winter seasons are continuing.

Please feel free to contact me if you have any questions regarding this request or if there is a cold storage question I can attempt to answer or investigate. My e-mail address is dpj0001@auburn.edu and phone number is (334) 844-8071.

Fusiform Rust on Longleaf Pine?
Tom Starkey

Yes, *longleaf* pine; that is not an editorial typo! Twice this past year, Scott and I heard a presentation by Dr. Ed Barnard, Florida Division of Forestry, discussing fusiform rust in longleaf pine. It is, perhaps, a good time to make everyone aware of a *potential* problem. Here is some of the information and pictures Ed shared:

If you look at literature on longleaf pine, you will see phrases such as "high resistance," "seldom a problem," "natural resistance," and "tolerant" in relation to fusiform rust. The reality is longleaf pine is *not* immune to fusiform rust. In 1992, Walkinshaw and Barnett reported the results of a survey in *Forest Farmer*. Significant rust infection of longleaf pine was found in MS, FL, GA, and LA. At one Florida site, stem galls were found on 67% of the trees. Infections up to 80% were recorded in longleaf pine in GA. Several seedlots in GA had more than 50% infection. Seedlings from LA and TX had infections ranging from 34 to 52%. In 2002, Barnard and Van Loan surveyed 78 longleaf plantations in north Florida and the panhandle. Ten of the plantations had 10 -30% stem galls. Three of the plantations had more than 30% stem galls.

How significant of a problem is fusiform rust in longleaf pine? We don't know as we have not heard from anyone within the Nursery Cooperative with this issue.

Ed Barnard recently sent seed from 9 longleaf sources to the USFS Rust Testing Center in Asheville, NC for evaluation. Those of you who grow longleaf pine should examine seedlings from each of your longleaf seedlots to see if you have any unusual, questionable swelling at the root collar, similar to the seedlings in the picture. If you do find some, please let us know as we would like to keep track of fusiform rust on longleaf pine from areas outside of Florida.

Seedling Tip Blight Revisted - (Fall 2005 Newsletter)
Scott Enebak

I have received two samples in the mail and one e-mail with images concerning tip blight or tip dieback of loblolly pine. Looking back through the Nursery Coopertive Newsletters and judging from the literature, it appears tip blight was more common in the late 1970s. Therefore, disease symptoms may not be familiar to some. With seedling tip blight, the terminal inch or two of tissue is killed and the stem tissue usually turns purplish and dries up. Sometimes the seedling dies, but usually the disease is almost self-limiting as the necrosis stops where a lateral bud starts to grow.

Tip blight is sporadic (depending on weather) and typically shows up in August or September and is mostly gone by October. However, it can appear anytime after it gets hot enough for seedlings to wilt slightly in the afternoon. Dieback usually appears to be random and diffusely scattered through a nursery without evidence of infection centers or secondary spread, sort of like a random shotgun blast. Sometimes, there can be more disease among seedlings with restricted root systems, such as those in intermittent wet-spots or where the undercut is nearer the bed surface. This may indicate a role for temporary wilts in infection and disease progression.

The first journal article published for loblolly or slash pine was a 1982 article by Jim Rowan. There are a couple of nursery proceedings by Charles Affeltranger (1983 and 1988), but the “disease” doesn’t even get a mention in the Forest Nursery Pests Handbook.

Actually, tip blight is a syndrome or a collection of symptoms as several fungal species are typically isolated from symptomatic tissues (Fusarium, Diplodia, Phomopsis, etc.) and experimentally, though apparently not in nature, infection requires wounds. Fungicidal sprays have not been cost effective and outplanted symptomatic seedlings survive as well as healthy ones (Rowan 1982, Affeltranger 1982).

When asked my opinion of spraying either regularly or in association with top-clipping to reduce the incidence of tip blight, I am non-committal. I have learned that the disease will “go away” and the seedlings will get better anyway and data show the disease does not affect outplanting survival. Although he presented no data to support the claim, Affeltranger reported that spraying with fungicides reduced incidence but was not cost effective. However, fungicidal sprays probably "buy" some peace of mind. I always suggest that a couple of control plots be left to see if the disease incidence is reduced by treatment. This way, you really know if your treatment was effective. Thus, knowing the psychology of nursery managers and the premium for a restful night’s sleep, I think that most nursery mangers spray and we don't hear any more about tip blight when lifting.

Seedling Disease Clinic
Tom Starkey

The Nursery Cooperative staff saw a wide spectrum of seedling issues this past year in the laboratory, in both bareroot and container seedlings. The most frequent repeat occurrence was freeze injury.

If you have any questions about the identification and management of these issues, be sure to check previous issues of the Newsletter, the list of Research Reports, the Nursery Cooperative’s web page, or just give one of us a call.

Here is a list of the problems that David, Scott & I were involved in during 2009:

1. Freeze injury in pines and hardwoods
2. Pitch Canker in bareroot and container
3. *Rhizoctonia* Foliar Blight in container
4. *Fusarium* root rot in bareroot and container
5. Cultural/management problems in container
6. Tip Blight in bareroot
7. Nematode problems
8. Insecticide damage from petroleum solvents in bareroot and container
9. Herbicide injury in bareroot and container
10. Sawdust leachate problems
11. Stunted bareroot hardwoods
12. Top pruning issues
13. Seedling mortality due to improper storage
14. *Botryosphaeria* blight on outplanted trees
15. Tip moth on outplanted trees
16. Anaerobic outplanted trees
17. Insect feeding on outplanted trees