

# Southern Forest

Nursery Management Cooperative

Spring 2010

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## Director's Report

Another winter and lifting season has gone by since our last newsletter. If you have had anything like we've had in Alabama, things are wet, wet, wet and more wet which can only be slowing things down for everyone involved in tree planting and lifting. Some of the chatter we've heard is that coolers are full of seedlings as everyone tries to get the seedlings out of the ground in anticipation of the planters coming to get them. Rain fall in Auburn over the winter, like elsewhere was above average for the area and is a far cry from 2007 when most areas in the southeast were experiencing a record drought. We can only hope that we continue to get adequate, properly spaced and timed rainfall for the rest of the year. Nursery studies were taken down and data collected this past winter and put into Research Reports that will be published this year. Long-time seedling processor, Tommy Hill (Ret), tells me that this year's 41,298 seedlings measured is a new Nursery Cooperative record, beating last year's record of 32,181 seedlings. This included RCD's, seedling heights, rust galls, seedling dry weights and root scanning data. A special thanks to Rene Miller, Blake Lipscomb, Patrick Jernigan, Tommy Hill and Barry Brooks for their efforts this past winter to measure and process all that data. New studies have been worked out and those are getting ready to be installed this spring as outlined in the Work Plan approved last November. Other items of interest include the Contact Meeting that will be held in Little Rock, Arkansas on July 26, 2010 along with the Southern Forest Nursery Association's meeting (July 27-29, 2010). Watch your e-mail and mail for specific announcements concerning the Contact meeting. A lot of nursery related research was finished last fall and there are

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a number of pesticide issues looming on the horizon. We continue to work on the MBr issue both CUE and QPS, re-registration of pesticides and evaluation of alternative fumigants, fungicides and herbicides. Many of these topics are discussed in more detail below which I encourage everyone to read and digest carefully.

**People Moving On.** This has been a spring of change at Auburn. Long-time Forestry Technician Tommy Hill measured his last seedling on February 26, 2010. So after 35 years at Auburn, Tommy has retired to spend his time growing tomatoes at his place south of Auburn. For those of you not in attendance at the Advisory Meeting in Auburn, Tommy was given Service Plaque thanking him for his work and dedication to the Nursery Cooperative and a Gold-Plated (painted) Seedling Counting Frame that those in attendance could sign. We wish Tommy well in his retirement. The School of Forestry also officially recognized his service at a reception on February 23.

With the monies from the USDA Areawide Soil Fumigation Trials, we were able to hire Barry Brooks and Marietjie (Marie) Quicke in 2006. Both of whom have helped Tom, David and I out EMMENSLY with their work on soil fumigation and everything else Nursery Cooperative-related.

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Marietjie Quicke announced that she would be stepping down in April 2010, to follow her husband's (Dr. Harry Quicke) relocation to Fort Collins, Colorado. That has left a big hole in the USDA Areawide that we will have to fill in the short term.

On top of that, David South is winding down his employment at Auburn University as well and will be stepping away from Nursery Cooperative work in the near future.

Given the current economic conditions, there is no chance that the SFWS would replace David South's (not that he could be replaced) with someone to pick up the tasks that David did for the Nursery Cooperative. We are exploring the option of moving some hard-dollar support from SFWS to Tom Starkey which would free up Cooperative Dues and allow us to hire a Research Fellow that would focus on herbicides and seedling quality. I'll keep everyone informed as plans are finalized.

If that wasn't enough, Dr. Richard Brinker, Dean of the School Forestry and Wildlife Sciences, announced his retirement effective December 31, 2010. It is possible that SFWS will have Dr. Brinker's replacement by the time of Advisory meeting in November.

**Contact Meeting.** The 2010 Nursery Cooperative Contact meeting is scheduled for Monday July 26, 2010 from 12:00 PM to 5:00 PM in Little Rock, Arkansas. The half-day meeting will be in conjunction with the biennial Southern Forest Nursery Association meeting that begins Monday evening, July 26 and runs through noon on Thursday July 29, 2010. Registration for the Contact Meeting will be separate from SNFA registration and will be following as soon as we have everything finalized. As is the normal practice we will have a half-day indoor session of Nursery Cooperative Staff presenting their most recent research findings and are working with Alan Murray of Arkansas Forestry Commission for the nursery tour. Put that week on your calendar so that you can plan to attend.

**Nursery Production Survey.** Now into our 7<sup>th</sup> year, the Nursery Cooperative will again survey regional seedling production and will survey as many nurseries as possible to obtain a complete and accurate picture of production levels. This mail-out survey will be sent in early June and I ask that you help us out and return the survey back to us. Last year's results are published as Technical Note 09-01. This can be accessed on the Nursery Cooperative web site or drop Elizabeth Bowersock a note (334.844.1012 or [bowerrep@auburn.edu](mailto:bowerrep@auburn.edu)) and she'll see that you get a copy.

(Some Good, Great, Awesome...)

## Pesticide News

**Risk-Mitigation of Soil Fumigants.** Despite EPA's timeline that new soil fumigant labels be ready by January 1, 2010, there is yet to be approval of the soil fumigant labels by either EPA or State officials. Thus, nurseries will be operating under the 2009 MBr and Chloropicrin labels and requirements. One of the biggest snags in the process is how the chemical registrants should handle the "first responder and community outreach" programs. EPA and the registrants have yet to come to an agreement of what, whom, when, and how this is actually going to be completed. Ideas bounced around include Public Service Announcements on TV and Radio, legal notices published in the local newspapers, color brochures in libraries, schools, department stores (Home Depot, Wal-Mart, etc). This is a cantankerous area of the Risk Mitigation measures required by EPA and there is a big gap in what the parties deem necessary.

Because of the lack of progress, a number of pesticide groups (Association of American Pesticide Control Officials, National Association of State Departments of Agriculture, Washington and Florida Departments of Agriculture) have written to Steve Owen, Assistant Administrator to EPA, asking that the new label requirements and implementations be delayed. To that end, EPA has been silent, so we go with last year's labels until notified otherwise. In the past, EPA has made announcements at the last minute, so managers must be prepared for the new label(s) if they are approved for this years' fumigation. Table 1 is the implementation timeline EPA originally proposed in May, 2009 for the new labels.

**Table 1.** Implementation Schedule for Soil Fumigant Risk Mitigation Measures

Risk Mitigation Measure	2009	2010	2011
Restricted Use - metam sodium and dazomet	◦	•	•
New Good Agricultural Practices		•	•
Rate reductions		•	•
Use site limitations		•	•
New handler protections		•	•
Tarp cutting and removal restrictions		•	•
Extended worker reentry restrictions		•	•
Training information for workers		•	•
Fumigant Management Plans		◦	•
First responder and community outreach		◦	•
Applicator training		◦	•
Compliance assistance and assurance measures		◦	•
Restrictions on applications near sensitive areas			•
Buffer zones around all occupied sites			•
Buffer credits for best practices			•
Buffer posting			•
Buffer overlap prohibitions			•
Emergency preparedness measures			•

◦ = under development/partial implementation

• = adopt completely

**Buffer Zones.** In the May, 2009 RED's, the Buffer Zone restrictions posed the greatest limitations in using either MBr or Chloropicrin and the ability of nurseries to continue to operate. With recent soil flux trials conducted in Florida and Georgia, modification of credits for plastics and organic matter, the buffer tables have been modified such that I am confident that nurseries can continue to operate without any displacements, disruptions, or delays in their historical fumigation plans. This good news with soil fumigation is because of three reasons 1) the ability to allow overlapping buffer zones of fumigated blocks, 2) the ability of Hendrix and Dail to operationally glue, either Virtually Impermeable Film (VIF) or Totally Impermeable Film (TIF) in a broadcast system and 3) the decision by Raven Plastics Inc in South Dakota to invest in new line that will produce 13 ft TIF for North American customers.

To show you how far we have come in our ability to use soil



fumigants, I offer everyone this comparison. When the first EPA rules were released in February 2007, a 20 acre block, fumigated with 350 lbs chloropicrin had a 4200 ft (1400 m) buffer zone. Today, that same 20 acre block, using credits published in May 2009, has the buffer zone at 40 feet! This assumes the use of VIF or TIF, reduced rates of soil fumigants of chloropicrin (probably 200-250 lbs) due to the plastics and 2% organic matter. In addition, I've been told by USDA, EPA and APHIS, that the new soil flux data from flat fumigation studies proposed by myself, Tom Starkey, and Dean McCraw, and conducted through the USDA Areawide in Georgia and Florida, that the Buffer Tables published in May 2009 will be reduced even more, probably to 25 feet.

**VIF or TIF plastic?** Our standard HDPE plastic is rapidly becoming a dinosaur which will soon be extinct, and probably for good reasons. There are two alternatives available at this time: VIF which is Virtually Impermeable Film and TIF which is Totally Impermeable Film. From EPA's perspective, both plastics will give nursery managers a 60% buffer credit. These plastics must remain down for 10 days which should not be a problem as they are tougher and lay tighter on the field. After at least 10 days, the tarps must be cut open (slit) to allow remaining gases to dissipate and cannot be removed until the next day. The plastic is going to cost more than HDPE, but by using these plastics nurseries should be able to reduce the fumigant rates (ai) to compensate for the increased plastic costs.

**80:20 vs. 98:2 MBr.** When the new labels are finally released, forest tree nurseries can still use 98:2 MBr. However, EPA will be requiring such stringent PPE regulations for all applicators that you will probably not find an applicator willing to apply 98:2 MBr/Chloropicrin. Therefore, 80:20 MBr will be the most common formulation for nurseries which has minimal PPE requirements. Suggested rates of 80:20 under TIF or VIF should be 200 – 250 lbs/acre range. See the Fall 2009 Newsletter for the "Watch Trial" recommendations.

**Fumigation Management Plan.** So while you smile at the reduced buffer zones and all the things you do not have to do (move neighbors, notify neighbors, monitor air every two hours, get permission to post signs on neighbors property, close your offices, packing sheds, etc) let me bring everyone back to reality. One thing that all nurseries need to be looking at is the Fumigation Management Plan (FMP) that will be required in 2011. This 13 page document was part of the May 2009 Final Rule and will need to be filled out by both the nursery and the applicator for each block fumigated. This will be a huge time sink the first time this document is required, but after each block is worked out, you'll be able to modify the dates, rates, etc as you move into future fumigation events down the road. If you have not looked at the document I urge everyone to begin the process of filling out the Fumigant Management Plan early so that when it comes time to really need the document in 2011 that all your questions have been answered. If you need a copy of the FMP it can be accessed here: [http://www.epa.gov/testmike/oppsrrd1reregister/soil\\_fumigants/fmp-template-for-2010.pdf](http://www.epa.gov/testmike/oppsrrd1reregister/soil_fumigants/fmp-template-for-2010.pdf)

**CUE and QPS.** An ongoing process within the Nursery Cooperative has been to continue to push EPA, USDA and APHIS for the ability to obtain and use MBr either as a critical use exemption (CUE) or quarantine pre-shipment (QPS). This past July 2009, Tom Starkey and I applied for the annual Critical Use Exemption through EPA and the United Nations, and as in previous years, applied for ALL forest-tree nurseries in the southern United States (member and non-member nurseries). In December 2009, I was notified by USDA-APHIS that EPA was cutting the Forest Tree Nursery CUE request by 75% because: 1) Two forest seedling consortiums did not apply for CUE and 2) methyl iodide was available (registered) for use in the US. In a nutshell EPA erroneously took the 1) "non application of a CUE" as forest-tree nurseries no longer need MBr and 2) the registration of methyl iodide is a certain "drop in replacement" for MBr. It took a number of phone calls and numerous e-mails to EPA to let them know that: 1) the Nursery Cooperative files on behalf of all nurseries (member and non-member) and, 2) that the lack of a CUE application does not imply the lack of need for MBr and, 3) that despite all our efforts, we cannot get methyl iodide tested in forest tree nurseries, so 4) this soil fumigant is not a drop-in replacement for MBr. To that end, EPA cut the Forest-Seedling request by 25% rather than the planned 75%. When CUE MBr is no longer available, there will only be QPS MBr, and that too, is under scrutiny by the Parties. However, a bit of good news in that regard; the Tennessee Department of Agriculture adopted new plant protection rules that allows forest tree seedlings to use QPS MBr for the production of seedlings involved in intra-state movement.

**Proline Update.** We at the Nursery Cooperative have been testing Proline for the control of a number of important nursery diseases for about 30 months. These diseases include Fusiform Rust, Pitch Canker and Rhizoctonia Foliar Blight. The fungicide is labeled for use on Agricultural Crops (peanuts, corn, soybeans, etc) for the control of foliar diseases and soybean rust on millions of acres annually. Testing newly developed pesticides for the control of insects, weeds and diseases is one of the primary functions of the Nursery Cooperative and its members. In the past, the Nursery Cooperative has been able to obtain special use permits, known as 24C labels for many fungicides, insecticides, herbicides that are developed and used in agriculture settings for forest seedling use. Some of these include Pounce, Reflex, Dimilin, Waylay, Arctic, etc. This process typically involved four steps: 1) Research data to support the effectiveness of the compound against the pest and safety on the trees (Nursery Cooperative Research), 2) Support by the company willing to add a new crop (seedlings) to their current label. (for example, "Sure we would love to sell you this compound for seedling use"), 3) Support by the individual Pesticide Review Board of each state that has a member nursery (24C labels are issued in a state by state case), 4) Approval by US Environmental Protection Agency.

Last March, Tom and I, with agreement from Bayer Crop Science, submitted our request for 24C labels for the control of Pitch Canker and Rhizoctonia in 6 southern States (SC, NC, GA, AL, MS, TX). We received word that approval had been granted in five of the six states with the last state pending. However, the last



step, Number 4, approval by US EPA has changed and has put the Nursery Cooperative in a bind. About a year ago, EPA, changed the process by which new pesticides are added to labels. So, what once was a relatively easy process has now become potentially costly and complicated. The new EPA process is that "Any new use (area, crop) of a currently registered pesticide, will need to have an environmental impact assessment completed, before any new label will be approved." When EPA found out about the 24C labels, they asked Bayer Crop Science to "voluntarily withdraw the 24C labels, or face a non-compliance letter" in their file because "failure to conduct an environmental impact assessment" of using Proline on nursery seedlings. So, Bayer Crop Science, pulled the 24C labels from the market.

In the past, the 24C route was the most effective way to get pesticides labeled for use in forest tree nurseries. However, today, because of the 1) small market, 2) limited returns on their investment and 3) current market conditions, Bayer Crop Science is not, nor will not pay EPA the PRIA fee to get the environmental impact assessment completed for Proline's use in forest tree nurseries. The PRIA fee for an "additional use, non-food, outdoor" registration fee was \$22,827.

So, with a bit of paperwork and documentation, I was able to get Auburn University's Payment and Procurement Services to cut a check from Nursery Cooperative carryover funds to cover the EPA PRIA fee. On December 29, 2009, EPA acknowledged their receipt of the check and the data to support the full label of Proline on hardwood and conifer forest tree seed and seedlings. EPA has 15 months to approve the label so if all goes well nurseries should be able to use Proline by May 2011.

**Inert Ingredients.** The EPA has proposed that pesticide manufacturers list all ingredients in their formulations. Currently, only active ingredient are listed, though other ingredients("inert") can be harmful (e.g. cause phytotoxic damage). The EPA makes a strong case that disclosing ingredients which will promote more trust in product safety, and leads to better products through market pressure. Comments were submitted to EPA on behalf of the Nursery Cooperative to support the disclosure of all ingredients in pesticides formulations registered under FIFRA.

**USDA Areawide MBr Alternative Program.** The Nursery Cooperative was awarded the fourth year of funding for the south Atlantic USDA Areawide MBr Alternative program in November 2009. This year's award of \$157,000 will be used to examine and quantify the large-scale testing of MBr alternatives in the production of forest tree seedlings. Tom Starkey and Marietje Quicke will be coordinating these trials for the second growing season in Elberta, AL and Camden, AL and first year trials in Glennville, GA and Camden, AL. As part of these trials, both nurseries will use the low soil impact rig that was developed by Dr. Dan Chellemi at USDA-ARS and demonstrated at the Contact Meeting last June in Daphne, AL. These large-scale fumigation trials will examine 1) the effects of using the low soil impact and reduced rates of soil fumigation

and 2) the effects of TIF and reduced rates of soil fumigation on the production of seedlings over the nurseries normal rotation.

### **New Fungicide for Testing**

Tom Starkey

Early in the season, especially in container culture, damping off is the number one threat. The options for chemical control are limited. In January Valent Professional Products announced Adorn™ Fungicide had received EPA registration for control of downy mildew, Phytophthora and Pythium in greenhouses and nurseries. Adorn™ is a new chemistry with the active ingredient fluopicolide which "may be used on container, bench, or bed grown ornamentals in greenhouses, ..., shadehouses or outdoor nurseries in conifers....." It may be used as a drench at 1-4 fl oz/100 gals of water according to the label. Another Valent web site suggests using a drench of 1- 2 fl oz/100 gallons.

The Nursery Cooperative has not tested Adorn™ on pines. However, the active ingredient, fluopicolide, was included in a study on chestnut in TN and caused stunting. However, I would strongly encourage you test a small amount this year on your conifers while you rely on your other fungicides for normal control. If no problems are observed, you may have another fungicide to use next year. If you decide to try this fungicide, do so initially on a small section (the label provides a table with directions for mixing as little as one gallon) and observe the seedlings over a 2 week period for any phytotoxicity or unintended results.

Please let us know if you test it and give us your feedback, pro or con.

## *Research News*

### **2009 Methyl Bromide Alternatives in Alabama Forest Seedling Nurseries - First year results**

Marietje Quicke

The first growing season results for the 2009 Area-Wide Methyl Bromide Alternatives trials at Joshua Timberlands Nursery in Elberta, AL and Weyerhaeuser's Pine Hills Nursery in Camden AL are presented below. The soil fumigants and rates used at each nursery are listed in Table 1.

**Results and Discussion:** Elberta experienced a heavy rainfall two days after sowing causing bed and seed wash, thus affecting their seedling density and seedling target numbers. Due to low seedling densities (12/ft<sup>2</sup>), 85% of the seedlings were Grade 1 seedlings. The root morphology data showed no significant difference between soil treatments for root length. DMDS+Chlor had significantly greater number of root tips compared to Chlor 60.

Seedling densities at Camden by the end of the 2009 growing

season showed no significant differences between the soil treatments. Seedling densities were at or above the target of 21/ft<sup>2</sup> for all soil treatments other than Midas and DMDS+Chlor. There were more Grade 2 than Grade 1 seedlings in all soil treatments except Midas 50/50. There were no significant differences in the root morphology measurements (length, surface area, average diameter & number of root tips) for all the fumigants. The Midas treatments had greater root length and root tips than any of the other soil treatments.

**Table 1.** Fumigants and rates used in 2009 Area-wide demonstration plots.

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

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

## 2010 Methyl Bromide Alternatives Trials in Forest Tree Seedling Nurseries

Marietjie Quicke

2010 brought a significant change in our Methyl Bromide Alternatives project. High barrier plastics and the USDA low disturbance fumigation rig that was demonstrated at the 2009 Contact Meeting in Daphne, AL were included. The 2010 Methyl Bromide Alternatives project are at Rayonier's Regeneration Center in Glennville, GA and at Weyerhaeuser's Pine Hills nursery in Camden, AL.

At Glennville the 4.6 acres replicated trial was installed on October 23, 2009. The USDA low disturbance rig designed and built by John Mirusso was used. The fumigant was coulter injected and the furrow closed with a beaver-tail and flap before the plastic was laid. The low-disturbance rig required that the trial area to be rolled, not cultivated, before fumigation. The fumigants, rates and plastics are listed in Table 1.

At Camden the 8 acre replicated trial was installed on March 23, 2010. The newly modified Hendrix and Dail rig (hot glue and beaver-tails) and the USDA low disturbance rig were used. The fumigants, rates and plastics are listed in Table 2.

**Table 1.** Fumigants & rates for Area-wide demonstration plots at Glennville, GA.

Fumigant	Rate	Components	Plastic
Chloropicrin	200 lbs/acre	100% Chloropicrin	LDPE
Chlor 60	200 lbs/acre	60 % Chloropicrin + 40% 1,3-D (Telone)	LDPE
Pic+	200 lbs/acre	85% Chloropicrin + 15% Solvent A	LDPE
Chloropicrin	100 lbs/acre	100% Chloropicrin	VIF
Chlor 60	100 lbs/acre	60 % Chloropicrin + 40% 1,3-D (Telone)	VIF
Pic+	100 lbs/acre	85% Chloropicrin + 15% Solvent A	VIF

**Table 2.** Fumigants & rates for Area-wide demonstration plots at Camden, AL.

Fumigant	Rate	Components	Plastic
Chloropicrin	250 lbs/acre	100% Chloropicrin	TIF
Chlor 60	250 lbs/acre	60 % Chloropicrin + 40% 1,3-D (Telone)	TIF
Pic+	250 lbs/acre	85% Chloropicrin + 15% Solvent A	TIF
MBr 80:20	250 lbs/acre	80% Methyl Bromide + 20% Chloropicrin	TIF
Chloropicrin	150 lbs/acre	100% Chloropicrin	TIF
Chlor 60	150 lbs/acre	60 % Chloropicrin + 40% 1,3-D (Telone)	TIF
Pic+	150 lbs/acre	85% Chloropicrin + 15% Solvent A	TIF
MBr 80:20	150 lbs/acre	80% Methyl Bromide + 20% Chloropicrin	TIF
<b>Low Disturbance Rig</b>			
Chlor 60	250 lbs/acre	60 % Chloropicrin + 40% 1,3-D (Telone)	HDPE
Chlor 60	150 lbs/acre	60 % Chloropicrin + 40% 1,3-D (Telone)	HDPE

Many thanks go to Kelly Dougherty and the Rayonier nursery crew and Ralph Bower and the Weyerhaeuser Pine Hill nursery crew for their help and cooperation.

## Rhizoctonia Foliar Blight Control Using Proline® - Second Year Results

Tom Starkey

Rhizoctonia foliar blight (RFB) is a fungal disease that affects almost all conifers, but longleaf and loblolly pines are particularly susceptible. The blight is caused by species of *Rhizoctonia*. Rhizoctonia foliar blight can cause significant pine mortality in nursery beds and typically occurs in late July when the seedling canopy closes in. The symptoms of dead and dying needles and

seedling mortality appear in patches within the bed where moisture and temperature favor infection. Many times the disease is not observed until seedlings are top-clipped to maintain seedling shoot: root ratios. Rhizoctonia foliar blight is not distributed uniformly throughout a nursery and is generally limited to isolated foci rather than an entire bed. Varying degrees of resistance among families can be found with US gulf coastal seedlots more susceptible and rare on slash pine. The disease is also more severe in second crop fields. While there are fungicides registered for Rhizoctonia foliar blight, they are not always efficacious.

In 2008 we first compared Heritage® (azoxystrobin, Syngenta) (24 oz/a) and Proline® (prothioconazole, Bayer CropScience) (5.5 fl oz/a) using the label recommendation of one application every two weeks. Within our test plots, we had 16% infection with Heritage® and 0.3% infection with Proline®. In addition to the excellent control with Proline®, the nursery personnel also observed that the seedlings were much greener than the control or Heritage® plots while the spray application were being applied. During the 2008 season there was a total of 825 hours of free moisture on the foliage (from July to September) which is essential for disease development.

In 2009 we continued our nursery and greenhouse testing with Proline®. We evaluated the ability of Proline® to control Rhizoctonia Foliar Blight by extending spray applications to every three weeks. Last year, there were 761 hours of free moisture. Extending the spray applications to every three weeks still provided significantly better control with the Proline® (1% infection) compared to Heritage® (34% infection). Similar greening of the foliage was also observed this past year.

This study has provided us with an abundance of data which was extremely important in our labeling efforts. We will discuss more of the results at this year's Contact Meeting in Arkansas.

## **2009 – 2010 Southern Pine Nutrient Survey**

Tom Starkey

In 1982 Boyer and South published the results of nutrient survey of loblolly pine. We have used the results of this survey many times as we evaluate nutrient levels of samples sent into the Nursery Cooperative Disease Clinic. This survey only reported on the nutrient levels late in the season. We know however, that concentrations of various nutrients change over the growing season. Therefore, this past year we asked nurseries in the Cooperative to provide us with samples in July, Oct and Feb. The foliage from bareroot & container loblolly pine and container longleaf pine were analyzed by A&L Laboratories in Memphis, TN.

The results will be published first in a Research Report for your use. We will also put the data on the Nursery Cooperative Web Site so that each nursery can look at the results throughout the year. We intend to report the median, maximum and minimum concentration for each element along with some important ratios.

Here are some of the preliminary results we found. Bareroot loblolly pine had higher nitrogen levels than container loblolly pine at all three sampling periods. The nitrogen levels of container longleaf pine were consistently lower than container loblolly pine. It was interesting to note that the nitrogen levels of both bareroot and container loblolly dropped more than 50% from July until our last sample in early February. A similar drop of more than 45% was observed for phosphorus, potassium and sulfur. Nitrogen levels of less than 1% were commonly reported for container loblolly and longleaf in the February sample. This low level is most likely attributed to the cessation of fertilization in late fall when seedling target specification are reached. It does not take long to leach-out any remaining nutrient from the container plug after fertilization is stopped. We also looked at the amount of variation from nursery to nursery as measured by the coefficient of variation. The February sample had the greatest amount of nursery to nursery variation for both bareroot and container loblolly. The nursery to nursery variation for container longleaf was fairly uniform from sample to sample but, overall, the container longleaf variation was higher than either bareroot or container loblolly.

We will present more of the results at the Contact Meeting this summer in Little Rock Ark.

## *David's Den*

### **Herbicide Galls**

David South

Several herbicides in the dinitroaniline family can cause swellings (i.e. galls) to form near the groundline of soybeans, conifers and hardwoods. Surflan®, Barricade® and Pendulum® have caused galls to form on nursery seedlings. Genetics, rate, timing and soil properties (e.g. organic matter content) interact to determining how many seedlings have galls.

Surflan®, Barricade® and Pendulum® have all been used in hardwood nurseries with generally good weed control. Barricade® and Pendulum® have been used on oak seedbeds with no reported problems with galls. However, when treated with Barricade® and Pendulum®, some species, like sugarberry, have formed galls and resulted in brittle stems. This suggests that genotype plays a major factor in determining if galls are formed on stems. Operational reports last year suggest that gall formation also depends on pine genotype. Some genotypes have herbicide galls on 30% of the seedlings (when treated in June with Pendulum Aquacap® at 68 fluid ounces per acre).

This year we learned that the date of herbicide application makes a difference in gall formation. The best time to apply Pendulum Aquacap® is just after sowing. This gives the best control of spurge and the fewest galls. In contrast, a June application will increase the chance of gall formation.



As most would agree, herbicide rate affects both weed control and gall formation. At one nursery, a 34 ounce rate of Pendulum Aquacap® resulted in 16% galls while a 68 ounce rate/acre resulted in 34% galls. Unfortunately, a 34 ounce rate Aquacap does not provide as effective control of spurge as a 68 ounce rate.

At some pine nurseries, 68 fluid ounces/acre at time of sowing results in less than 1% galls. We are not sure why this occurs, but it might be related to soil organic matter content. Soils with 1.5% or more organic matter might tie-up more herbicide and might reduce the formation of galls. Other factors such as clay content and soil temperature might also play.

In 2009, we tested Pendulum Aquacap® and a preemergence treatment (68 fluid ounces/acre) caused 1% and 6% galls at two nurseries and zero galls at two nurseries. At one nursery (with 17% clay and 1.5% organic matter), a 3X rate of Pendulum Aquacap® resulted in no galls on six different families of loblolly pine. We do not fully understand why galls did not occur at this nursery.

Many nurseries have relatively low spurge populations since they sow seed on freshly fumigated soil (or soil fumigated one year ago). Since spurge is common on “third-year ground,” we can expect spurge to be more of a problem if managers are forced to give up methyl bromide and have to fumigate with ineffective alternatives. For this reason, we plan on testing ways to provide effective spurge control with minimal formation of herbicide galls.

## COLD AND WET

This winter was a wet, cold one. Since 1895, January was among the 20 coldest recorded (for AL, GA, SC, NC, FL, LA and TN). For the Southeast (AL, FL, GA, SC, NC, VA), the average temperature in January was 41.5 F. This was -4.7 F cooler than the 1901-2000 (20th century) average and it was the 14th coolest January in 116 years. The average temperature in February was the 7th coolest February in 116 years (for the Southeast). The temperature trend for January in this region (1895 to present) is -0.2 F per decade. In January, an estimated average of 4.96 inches of precipitation fell in the Southeast. This was 1.05 inches more than the 1901-2000 average, the 21st wettest such month on record.

Valdosta, GA had about 200 more chilling hours (by March 7) than last year and 400 more chilling hours than in 2007. Apparently, the cold this winter kept our seedlings from “waking up” early and this reduced the occurrence of freeze injury to the cambium. Temperatures on January 10-11 were as low as 11 F (Rome, GA) and 16 F (Auburn, AL). Even though the temperatures were low, we may have escaped a “deacclimation freeze” this season. -- DS

## Nursery 101

**All Pesticide Formulations are Not Created Equal**  
Tom Starkey

A call comes into the Nursery Cooperative: “I don’t understand, this year Brand X herbicide just doesn’t seem to work like it used to. This year we bought Brand X made by Company Y which is different than we have used in the past. Shouldn’t Brand X work the same for all companies?”

In a recent *Greenhouse Management & Production* magazine (Feb. 2010 pg 30-31) an extremely informative article (*Not All Pesticide Formulations are Created Equal*) appeared that may answer the above question. It was written by Giulia Capuzzi, staff chemist, Syngenta Professional Products, [giulia.capuzzi@syngenta.com](mailto:giulia.capuzzi@syngenta.com). I have copied some of the important parts of the article below and italicized statements I found particularly relevant:

The quality of *inert ingredients can have a tremendous impact on the overall performance of chemical control products*. This becomes extremely important as active ingredients come off patent and become available by post-patent companies.

*The term “inert” is used by regulatory organizations to distinguish those chemistries in a product that are not participating directly in a biochemical interaction to control a particular pest. The term can be a bit misleading as these ingredients are not simply filling space, but play a key role in effectively delivering an active ingredient to a crop.*

Most active ingredients available today are not very water-soluble and, in fact, can be extremely hydrophobic or “water-fearing.” Simply put, *an active ingredient is not very effective in a spray tank if used alone. Inert materials are absolutely vital to turning active ingredients into user-friendly products* that can be easily mixed in water and applied with strong biological performance.

Typical inert ingredients in agrochemicals products include: surfactants, thickeners, preservatives, anti-foams, antifreeze, rain-fast agents and adjuvants. The types of inert ingredients needed for a product depend on the active ingredient, formulation type and any potential those inerts may have to cause phytotoxicity or damage to target crops. *The quality of an inert can have a tremendous impact on the overall performance of a product.* All inerts used in pesticide formulations must be approved for use by EPA.

**Post-patent products:** When regulatory packages are submitted to EPA, the formulation details are contained in the Confidential Business Information section. The formulation recipe is known only by the manufacturer and EPA. *Other companies, including post-patent suppliers, do not have free access to the formulation recipe and must develop or outsource development of their own formulations.*

"DISCONTENT IS THE FIRST STEP IN THE PROGRESS OF A MAN OR A NATION."

~ OSCAR WILDE

Basic chemical manufacturers have more years of experience working with the active ingredients they developed than post-patent companies would for the same molecule. This experience is critical to understanding technical aspects of the active ingredient needed to formulate the highest performing product possible.

*It's important for growers to know that formulation characteristics such as particle size, tank mix compatibility, ease of handling and mixing, resistance to microbial contamination and long term physical stability of the formulation are not regulated. It is up to the manufacturer's technical strength and industry stewardship to optimize these formulation properties. When post-patent companies want to register a product based on the basic manufacturer's registration (sometimes called a "me-too" registration), they are not required to submit efficacy data for their formulations. The post-patent companies can merely cite the basic manufacturer's data. It is possible for a post-patent company to sell a product that has never actually been commercially field tested.*

Formulations are highly complex systems that are critical for the safe and effective delivery of active ingredients to crops. Inert ingredients and processing parameters impact a grower's overall experience with a product. Processing parameters refer to a manufacturer's behind-the-scenes efforts during product development to ensure optimal formulation performance, including particle size, suspension concentrate and handling and mixing testing.

*When buying pest control products, growers should consider more than price. They should consider a manufacturer's reputation, its depth of scientific resources and industry dedication, and other support tools it offers to ensure a grower's business success.*

**Side Note, Proposed EPA Regulations:** EPA is considering regulations to require all pesticide manufacturers to list all inert ingredients on the label as it does with active ingredients. During the public comment period on this regulation that ended February 20, 2010 the Nursery Cooperative responded to EPA expressing our support for such legislation.

### Increasing Soil Organic Matter from the Office?

Tom Starkey

If you have been following the development of the EPA RED's you are aware that "credits" are available to reduce the size of the fumigation buffer zone. The largest credit of 60 % is available when high barrier plastics such as VIF or TIF are used. In addition, EPA has made available an additional 10 % credit for soil organic matter between 1% and 2%; a 20% credit for soil organic matter between

2% and 3% and a 30% credit for soils above 3%. No credit will be given for soils with less than 1% organic matter.

We have encouraged nurseries for years to pick a laboratory for your nutrient and soil analysis and stay with it for year-to-year comparative purposes. Different laboratories use different analytical methods to analyze certain elements. Just changing laboratories or requesting a different method of analysis can alter your results.

Many laboratories use several methods for determining your organic matter. Each method will provide results. We strongly encourage you to ask your lab what methods they have available for determining the amount of organic matter.

We recently sent a duplicate soil sample to A&L Laboratories in Memphis for analysis. We asked that the organic matter for one sample be determined with their standard method (modified Walkley-Black). We specified that the organic method for the other sample be determined by "loss-on-ignition" method. The loss-on-ignition method more accurately analyzes the total amount of organic matter in the soil which also includes the charcoal fraction. The result from their standard method (modified Walkley-Black) was 1.7%. The result from the "loss-on-ignition" method was 2.6%. Almost 1% higher!

We will provide more details at the summer Contact meeting concerning the methodology used by different laboratories to determine soil organic matter. As you can see from our results the difference in the two methods could mean up to 20% additional credit on your buffer zone. This may determine whether a field is kept in production or removed due to the buffer zone restrictions.

The RED's released by EPA are designed to reduce exposure to by-standers, not to increase the efficacy of the fumigant. The reason you can receive more buffer zone credits with higher organic matter is because the higher the organic matter, the more fumigant is tied up in the soil and the less likely it is to cause problems to by-standers. Therefore, the loss-on-ignition method more accurately indicates the total sites available for fumigant absorption.

The test results you may find will depend on your soil composition. I would like to suggest each nursery do the following to see the difference and determine which method you will use to verify the amount of organic matter.

1. Ask your laboratory what their "standard" method is for determining soil organic matter.
  - a. If it is anything other than loss-on-ignition, ask them if they can also do the loss-on-ignition test (most do).
  - b. Send two uniformly mixed samples to the lab. Request their standard method for one sample and loss-on-ignition for the other sample.



2. If the loss-on-ignition is their standard method. Prepare a uniformly mixed sample and sent half to your lab (specifying loss-on-ignition) and the other half to A&L labs in Memphis (or another lab that does the loss-on-ignition) also specifying loss-on-ignition.

## Leadership 101

### When Plans Don't Work, Keep Planning

Tom Starkey

As a former nursery manager I was asked the question many times, "why go to all the trouble of making plans since so much is out of our control?" The following summary points are from an article in *Leadership Wired* August 25, 2009 [www.giantimpact.com](http://www.giantimpact.com). It provides good insights, making the distinction between plans on a piece of paper and plans as a step to prepare our state of awareness. This same idea is found in a quote by Dwight D. Eisenhower; *"In preparing for battle I have always found that plans are useless, but planning is indispensable."*

### Why Plans Are Useless

**1) There's No Way to Control Your Competition** - Many of the plans we make in the nursery business are meant to make our products or services better than our competitor. These plans may be short-lived. As Colin Powell said, "No battle plan survives contact with the enemy." When our competitor comes up with a better product or service than ours, we must either scrap our plans and change or close our doors.

We all realize that there's no way to predict the strategies and innovations of our competitor. The business world is full of examples where good plans met an innovative competitor. The American car manufacturers met foreign competitors; the major record companies met iTunes and the traditional newspaper met online news sources.

**2) There's No Way to Control Your Circumstances** - In 2007 not many nurseries planned for the drought we had. Nurseries had to adjust or face major losses. You may grow the best seedling and provide the best service to your customer but no one can revive the stock market to put money back in people's wallets or allow the price of timber to go back up.

### Why Planning is Indispensable

Eisenhower recognized that concrete plans would sooner or later be discarded in the course of battle, but he prized the process of planning and the benefits.

**1) Planning Prepares You Mentally and Emotionally** - Planning, allows you to explore possibilities in your mind, examining the pros and cons associated with the decisions you may have to make. In this process, you may realize that if certain events occur, sacrifices may need to be met which generally have costs associated with them.

**2) Planning Helps You to Prioritize Your Resources** - Planning helps you prioritize resources of time and capital before they are needed. It is better to know your possible options before you find yourself in the middle of a crisis and forced to make a decision.

**3) Planning Causes You to Evaluate Your Assumptions** - All plans have assumptions associated with them. Planning helps you evaluate the strengths or weaknesses of the assumptions and gives you time to determine if they are valid or need to be modified.

### Summary

Plans are disposable and should be written on paper, but never stop the discipline of planning. Although a majority of your plans will be discarded, the process of planning won't fail to reward you.

## Miscellaneous

**Biomass Subsidies Could Impact Mulch and Pine Bark Prices**  
- Article from American Nursery & Landscape Association website (March 2010)

A seemingly innocuous program that came out of the 2008 Farm Bill could end up having major consequences on nursery production by substantially increasing the price of mulch and pine bark.

At issue is the Biomass Crop Assistance Program, which had the original intent of creating incentives for new clean energy biomass fuel sources like miscanthus, switchgrass and bamboo, among other crops. However, the program has mutated based on the U.S. Department of Agriculture's interpretation to include subsidies for wood fiber products, including pine bark and the bark used to make mulch products.

(Horticultural) nurseries in Alabama have already told ANLA representatives that pine bark suppliers stopped selling to them completely in the hopes of selling the product at a far more lucrative price to biomass industry. Pine bark makes up a substantial amount of the substrate used to grow nursery stock.

In response, the USDA has proposed new rules that would allow the subsidy only on wood products that are essentially waste and have no value to other industries. Corey Connors, director of legislative relations at ANLA, however, fears the USDA lacks enforcement power to regulate the rules, which are already relatively vague and likely won't be further defined. A more effective fix may have to come through new legislation, he adds.

In the meantime, the USDA is accepting comments on the new rules posted in the Federal Register through April 9. "If this goes into effect (30 days after April 9), there will be an immediate disruption of the market," Connors says, based on the discussions he's had. "People could instantaneously stop selling because the value of these materials will be radically disturbed in a heavily subsidized market."

## "Toys" for Nursery Managers

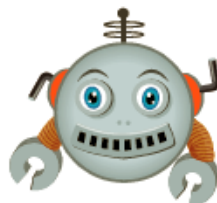
Tom Starkey

When the Spectrum® Technologies, Inc ([www.specmeters.com](http://www.specmeters.com)) 2010 catalog came several weeks ago, I immediately thought of the familiar quote "The difference between men and boys is the price of their toys." There were a number of interesting "toys" that I found intriguing. Spectrum® Technologies also manufactures "Watchdog" data loggers and weather stations.

I hate waiting for test results when samples must be sent to the lab. Now, you can purchase small handheld instruments that can measure potassium, sodium, nitrate nitrogen, chlorophyll, pH and EC in the plant or soil. These instruments range in price from \$150 to \$450, with the exception of the chlorophyll meter. A combination pH/EC meter is the only instrument most nurseries should have on hand. This is especially true of container nurseries which need be checking the pH and EC of their irrigation water and artificial media throughout the year. Older pH meters have a sensor with two somewhat fragile probes at the tip of the sensor. The newer pH meters have a single solid flat tip that works in liquids, semi-solids and solids.

Now, instead of straining your eyes looking through a hand lens, for about \$350 you can purchase an "IPM Scope". This small handheld scope will magnify and capture an image (diseased tissue, insects, etc.) at 40X or 140X, and download it to your computer for observation or sending images by email (to the Nursery Coop??).

Spectrum® Technologies, Inc has specialized in weather data collection for many years. Some of the more innovative weather recorders provide disease and insect modules designed to forecast when specific insect or diseases may be a problem. Do you need a data recorder for measuring temperature, relative humidity, dew point, chill hours with the option for soil temperature? Spectrum®



has at least 2 compact stand alone recorders for less than \$1,000.

If money is no object, you can buy a configuration that allows you to retrieve data with either wireless, transmitted to a cell phone tower or satellite. Then you can view the real-time weather information anyplace in the world with web access.

There are many more items described in this catalog. Probably more than you have the money to buy.

## 20 YEARS AGO...

What were the concerns of the Southern Forest Nursery Management Cooperative in the Spring 1990 Newsletter?

Bill Carey joined the Nursery Cooperative Staff (*see note below*). A new federal program (Farm Bill) to promote tree planting was discussed. Research reports included "Effects of Bayleton and Arasan Seed Treatments on Emergence of Southern Pines" "Root Stripping Reduces New Root Growth", "Early Growth Responses to Nitrogen" and Effects of Vapor Gard on Loblolly Pine Water Relations." Other production notes include the effect of water pH on Poast activity and note indicating that Superior Trees in Lee, FL was the first nursery to market and sell "morphology improved seedlings." David South included a clarification from EPA pertaining to the legality of using certain pesticides in forest nurseries which are site labeled for ornamentals. Registration for the 23<sup>rd</sup> Biennial Forest Nursery meeting to be held in Biloxi, MS will cost \$70 (my, how times have changed!). A report by Steve Cantrell from the Piedmont Nursery in Salem, SC discussed the impact of Hurricane Hugo. Robert Cross of International Paper Co. in Blenheim, SC reported that one billion seedlings had been produced by the company in nine years of operation.

Note from Scott on Bill: "It is hard to believe that it has been 5 years since Bill Cary and I were involved in the car accident that took his life. A lot has transpired since April 2005 and not a day goes by that I don't think about Bill and wonder what he would think about "this" or "that." Every Friday afternoon, as was our custom prior to his death, he and I would have coffee with his wife Debra at the Plant Disease Clinic. To this day, I still make a point to have Friday AM coffee with her. His widow, Debra Johnson (Carey), was recently re-married and still works for the Plant Disease Clinic on campus. However, she is contemplating retiring, now that her son Jack has graduated from Auburn. If anything good can come from this, I think I am more patient than I used to be. I enjoy the sounds of the spring peepers more and when things look grim around the halls of SFWS, I think of the awful, awful Friday afternoon and am thankful that I was able to walk away."

## Welcome, Little One!

We would like to welcome Brennan David Jackson to the SFNMC family!! Proud new parents are Paul and Melissa Jackson. Congratulations!



**Brennan  
David  
Jackson**

**Jan. 14,  
2010  
7 lbs 5 oz  
20.5 in**