AUBURN UNIVERSITY

AUBURN
FORESTRY AND WILDLIFE SCIENCES

SOUTHERN FOREST NURSERY MANAGEMENT COOPERATIVE

NEWSLETTER

SPRING 2006

DIRECTOR'S REPORT

I hope that everyone's season is off to a good start and in fine order. It has been a busy winter here at Auburn as we filled Bill Carey's position, continued to work on intra-state QPS and began to plan the Contact Meeting in Texas. Many of these topics are discussed in more detail below, along with warm winters (de-acclimation), a visiting Fulbright Scholar from New Zealand, and white grubs. . .

Membership

As of this writing the Nursery Cooperative has 20 members. Alabama Forestry Commission and Boise Cascade (Forest Capital) did not renew their membership for 2005-06 and Cell-For is still considering membership at the Associate Level. As mentioned in an earlier Newsletter, one of the unintended outcomes of the Critical Use Exemption (CUE) that was awarded to the Nursery Cooperative by the Montreal Protocol and the EPA was that in order to use MBr from the CUE, one needed to be a member of the Nursery Cooperative. While there have been a couple of inquiries from non-member companies about joining the Nursery Cooperative, to date none have done so.

Filling Bill Carey's Position… Continued & Completed

Replacing the position made vacant by the accident has been an awfully slow process at Auburn. After getting a second approval by the HR Department and advertising for the mandatory 6 weeks, the position officially closed on January 31, 2006. David, Ken and I winnowed the applicants down to 3 possible replacements. We were then able to schedule 3 applicants to interview for the position during the last week of February and the first week of March, 2006. Specific dates and candidate information were sent to the Advisory Members for their participation in the interview process. An offer was finally made on March 17th and Tom Starkey accepted the offer a few days later.

Introducing… Tom Starkey!

The Coop would like to welcome our newest staff member, Dr. Tom Starkey. He will be taking over the position that formerly was held by Bill Carey. Tom will begin working with us on April 17, 2006

Now for a few words from Tom:
"I am both excited and humbled to be able to assume this research position within the Coop. Since I began working for International Forest Company in 1994, I have recognized the important impact, both immediate and long-term, that the Coop has had on southern nursery production. I have been actively involved with the Coop on research projects and as an Advisory Committee member.

I have over twenty years experience growing trees both nationally and internationally. My undergraduate training was in Forestry from NC State and graduate training from Penn State in Plant Pathology. My personal areas of research interest are in seedling nutrition, fertilization and seedling quality. I also enjoy teaching leadership development and financial management. I very much appreciate this opportunity and am looking forward to working closely with each of you."

Advisory Meeting

The Advisory meeting is scheduled for Wednesday and Thursday, November 1 & 2, 2006 at the School of Forestry and Wildlife

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Sciences Building at 602 Duncan Drive in Auburn. Place those days on your calendar and more information will be available in the Fall Newsletter.

Contact Meeting

The 2006 Contact Meeting will be held in with the Biennial Southern Forest Nurseryman's Association conference in Tyler, Texas. Meeting dates for the SFNA meeting are July 10 through July 13, 2006. The Nursery Cooperative meeting will be Monday, July 10th, from 1:00 PM to 5:00 PM. With Harry Vanderveer's help, research plots for the nursery tour include 3 fumigation alternatives and herbicide trials set up by David South. **Please note that the registration for our Contact Meeting is done through the Coop and NOT through the SFNA organization.** As is the normal practice, we will have an indoor session of Coop staff presenting their most recent research findings.

Re-registration

There has been concern over the re-registration of a number of pesticides used in the production of forest tree seedlings. Just this week permethrin (Pounce), dimethoate (Cygon) and triadimefon (Bayleton) have required some action by user groups to EPA or chemical producers for some quick answers. I want to thank all of you who responded quickly and concisely as to how you use Bayleton in your production system. I have submitted the data to Bayer CropScience and to EPA through the public comments period. I would encourage all of you to submit comments to EPA that address the importance of the fungicide and steps taken to ensure that workers are protected while using the product.

Permethrin (Pounce, Waylay, Ambush) is also up for re-registration. I've been in contact with EPA and they have assured me that EPA's concerns for permethrin usage in forestry have been addressed. Copied below is an e-mail that I received in the middle of March concerning the re-registration of permethrin.

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Dr. Enebak:

Thank you for your proactive e-mail. We did have one post-application risk concern regarding conifer cone seed harvesting. The cancer risk estimate was above our level of concern (1E-04). I contacted John Taylor at the U.S. Forest Service, who told me that harvesting of conifer cone seeds does not occur until at least 30 days after the last application of permethrin. Since we do not have a dietary concern, we cannot issue a 30 day PHI, but we can issue an activity specific REI of 30 days. This mitigation increased the risk estimate to the 10-5 range, and this post-application activity is no longer a concern to the Agency.

We have no risk concerns for forest-tree production in nurseries. Therefore, at this point in time we intend to re-register permthrin products for this use. If anything changes and we need any additional information, I will make sure to contact you.

PESTICIDE NEWS

Issues

The 2007 CUE application was brought forward by the State Department to the Meeting of the Parties in Dakar, Senegal in December 2005. After considerable debate by the parties, the European Union granted the United States 26.4% of baseline of 1991 MBr production; 20% will be new production, 6.4% will come from MBr stocks. The total number of 26.4% represents a significant loss of MBr volume. The total difference (in pounds) between what can be produced in 2005 (30% of baseline) and what will be allowed to be produced in 2007 is approximately 5 million pounds. Using a rate of 300 lbs per acre, that equates to over 16,000 fumigation acres less of MBr material available for use.

The second problem is the 6.4% from stocks which is up from 5% in the 2005 CUE agreement. This will result in a drawdown in inventories that has been occurring since 2005. With a reduction in baseline production and the increased use of MBr inventories will only serve to increase the cost of CUE MBr and will eventually price most nurseries out of using MBr altogether.

The other source of MBr for forest-tree nurseries is the use of quarantine pre-shipment (QPS) MBr. As you all know, forest-tree nurseries have inter-state use of QPS. As long as seedlings are being shipped across state lines, nurseries can fumigate nursery soils with MBr to produce those seedlings.

In February, I went before the Alabama Plant Board and presented information concerning intra-state use of MBr and answered questions concerning the need of MBr and the language that was being adopted. The Plant Board unanimously approved the new rule and now both Alabama and Mississippi have rules/ language in place that allows both intra- and inter-state use of QPS MBr.

I have contacted all the State Plant Protection Officers throughout the Southeast to get their help in drafting language to support intra-state use of MBr

and will keep you informed of the progress. As of the writing of this article, I have had responses from LA, TX, OK, and NC.

EPA Rulings

For the month of January 2006 there was no CUE MBr for critical users. The reasons for no MBr were this: The 2005 list of Critical Uses has expired, and the 2006 list has not been finalized. There were likewise no Critical Users for the same reason. At 40 CFR 82.4 (p)(1)(i), there is a prohibition against anyone selling Critical Use methyl bromide without first getting the certification from the user. Since there are no critical uses, no one can provide the certification. At 40 CFR 82.4 (p)(2)(i), there is a similar prohibition against anyone acquiring Critical Use methyl bromide without providing the certification letter. While not affecting forest-tree nurseries because of their fumigation schedule, many users were unable to use MBr despite having been awarded a CUE.

On February 6, 2006, EPA finalized the rule re-establishing Critical Users and allowing certification of MBr use from the universal allocation. The rule published on February 6 also included membership within Southern Forest Nursery Management Cooperative as a critical user. For those of you who attended the Advisory Meeting in November in Auburn, it was brought up at the meeting that the draft EPA report had removed SFNMC as a critical user.

Basamid, MBr and Iodomethane (Methyl Iodide, MI)

In November 2004 and April 2005, Bill Carey along with Steve Godbehere (Hedrix & Dale), Bill Isaacs (South Pine/Certis) and Dean McGraw (Rayonier) installed a 9 section fumigation trial to look at fumigants over a two-year rotation. Most of Dr. Carey's notes concerning the experiment were lost/ destroyed in the debris of the accident. However, using photographs recovered from his camera, e-mail messages from his computer, and history plot data collected from Glennville, I was able to re-construct the plots, rates and species used in the trial.

Nine sections (81 beds) were used in the nursery. Three sections were treated with Basamid (490 lbs/ac), three sections with MBr (150 lbs 98:2) and three sections with MI (150 lbs 98:2). The Basamid sections were tilled and water was applied via irrigation pipeline as per manufacturer's recommendations. The MBr and MI sections were covered with either high density plastic (HD) or virtually impermeable film (VIF) at the time of fumigation. In each of the fumigated sections, families of both loblolly and slash pine were sown so that each soil treatment received the same families.

History plots were placed throughout the 9 sections and seedling data was recorded by Glennville nursery personnel. In addition to seedling counts, hand weeding time by bed was recorded for all 81 bedrows (9 sections, 9 beds). In November 2005, Coop personnel made a final seedling count for each species x fumigation x tarp and collected seedlings for biomass determination. Data from a total of 78 plots were collected and seedlings were returned to Auburn where seedling RCD's, height and root/shoot dry weight was determined.

In November 2005, soil samples were collected from each of the sections and returned to Auburn for soil-borne fungi determination. Soil was diluted and plated onto media selective for Trichoderma. Propagules per gram of soil was determined and recorded by fumigation only.

Table 1. Seedling characteristics by species and soil fumigation - 2005 Glennville, GA.

	Loblolly Pine			Slash Pine		
	MB[1]	MI	BAS	MB	MI	BAS
Density (ft^2)	21.6	22.9	20.3	20.6	20.0	18.5
RCD (mm)	4.9 a	4.7 a	4.3 b	5.3	5.2	5.4
Height (cm)	32.0 a	31.0 a	23.6 b	30.4 a	30.3 a	27.1 b
Root Bio (g)	0.65	0.65	0.61	0.64	0.66	0.78
Shoot Bio (g)	4.3 a	4.2 a	3.3 b	5.0 a	5.3 a	5.9 b

[1] Letters within a row and species indicate significant differences at the 0.05 level.

Table 2. Hand weeding time and weed biomass by soil fumigation - 2005 Glennville, GA.

	Fumigation		
Weeds	MB	MI	BAS[1]
Weight (g/riser)[2]	14.0 a	20.9 b	12.0 a
Time (seconds/riser)	35.2 a	59. 3 b	39.1 a

[1] Letters within a row indicate significant differences at the 0.05 level.

[2] Riser = sections between sprinkler heads.

Table 3. Soil borne fungi populations by soil fumigation - 2005 Glennville, GA.

	Fumigation		
Fungi[2]	MB	MI	BAS[1]
Trichoderma spp.	155.6 a	32.6 b	15.3 b

[1] Letters within a row indicate significant differences at the 0.05 level.
[2] Colony forming units per gram soil.

Methyl Iodide

One of the potential alternatives to MBr is methyl iodide (Iodomethane, MI). The Nursery Cooperative began testing this compound in 2001 and it has shown promise in seedling quality comparisons. While similar chemicals, the properties of MI differ from that of MBr. One property of methyl iodide which may give it an advantage over methyl bromide is that it has a boiling point of 42.5 °C (108 °F) while methyl bromide is a gas at ambient temperatures. The ease of handling a liquid over a gas might increase worker safety and application methods. Also, methyl iodide decomposes in light which will result in a shorter residence time in the atmosphere (a few days). In both USDA laboratory and field trials, methyl iodide was equal to or better than methyl bromide in controlling a number of soil-borne pathogens. Data noted above in Table 1, however, indicates that MI's control of weeds is not as effective as MBr. Both chemicals have short half-lives in water. Methyl bromide is hydrolyzed in 20 to 40 days and methyl iodide in 50 to 100 days.

MI's potential approval has not come without some concerns. Based on tests in California and Florida fields, EPA toxicologists concluded that unprotected farm workers could breathe harmful doses and that low concentrations could drift off fields. In contrast, EPA also determined that the workers would be safe if they wore respirators and that people near the fields would breathe such small amounts that they would face no known health risks. Also, like MBr, no residue of MI remains on treated crops.

Two problems with MI is that it is not registered for use in the United States and no one seems to know what the actual cost of the material would be if produced on a larger scale. The Environmental Protection Agency is expected to approve methyl iodide within a few months.

PRODUCTION TECHNOLOGY

Initial Growth Modeling

Dr. E.G. Mason
University of Canterbury
Christchurch, New Zealand

Initial growth models (IGMs) represent the growth and yield of trees in response to establishment practices, from time of planting until canopy closure or first thinning. They have two main uses:

- managers can use them to explore the likely impacts on survival and initial growth of seedling morphology and/or site preparation practices at time of establishment; and
- they can sometimes provide estimates of starting values for traditional growth and yield models (that generally start 5 to 10 years after the time of planting).

IGMs differ from usual growth and yield models in that IGMs begin at time of planting. Only a few IGMs allow the user to plant stock that varies in size. One IGM in New Zealand uses elevation, site, site preparation and seedling quality variables to predict the initial survival and growth of pines. Most IGMs are regional. For example, one was developed for pine and spruce in Ontario (Plant-PC) and one was developed for *Pinus radiata* growing in the central region of the North Island of New Zealand (IGM-2).

IGM-2 provides graphs that represent stocking, mean height (Figure 1), height distribution, basal area per ha, and diameter at breast height distribution for the first five years after planting. Independent variables for this model include quality of tree stock handling, tree stock ground-line diameter after planting, initial planting rate, site altitude, weed control, ripping, mounding, and fertilizing with diammonium phosphate (N+P). This model can be downloaded from http://www.fore.canterbury.ac.nz/software/igmv2.exe. Users of the model will learn that gains from planting *P. radiata* seedlings with 8 mm diameters (RCD) are greater than that obtained from fertilizing plus ripping of sites before planting pine seedlings with 4 mm RCD.

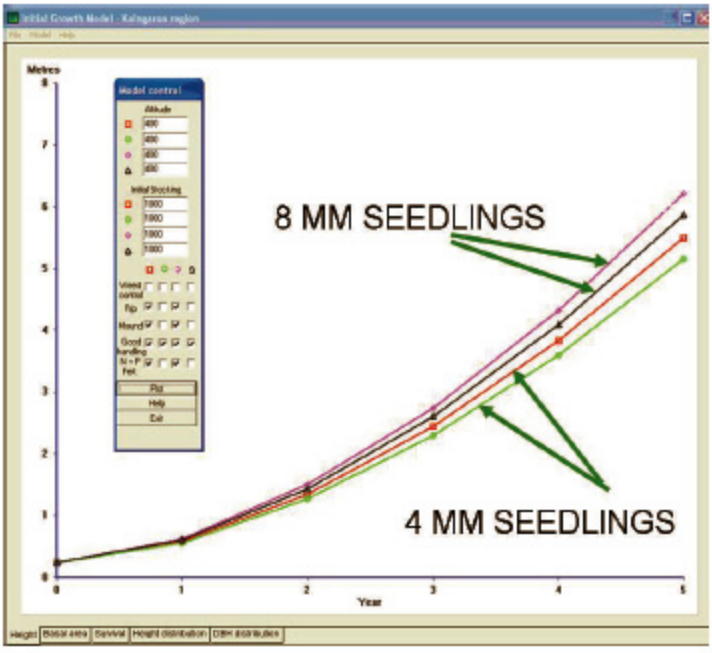
Extrapolation from IGMs

In many cases, managers will wish to extrapolate from IGM estimates. Estimating effects of, for example, planting large-diameter *P. radiata* seedlings increases initial growth up to age five but the IGM does not allow a full evaluation of the financial worth of the weed control method.

Research on extrapolation of IGM estimates and on rotation-length effects of site preparation treatments has produced the following general guidelines:

- Estimates of time gain owing to a treatment are more useful than those of yield gain unless yield gains are measured over entire rotations.
- Trajectories of treated and untreated stands commonly either diverge (with an increase in time gain), take parallel paths (with no further increase in time gain after an initial period of gain) or are essentially equivalent (no positive response at any point in time). In New Zealand, all recorded instances of gain from weed control or planting large-diameter seedlings have been of the first type, while studies of cultivation or fertilizing have exhibited all three types. In the southern US, control of woody weeds often results in a time gain that increases with stand age (about 66% of the time).
- Growth and yield models that represent older pine crops most often fail to predict outcomes of establishment practices if gain estimates from IGMs are used as inputs to adjust site index values.

Figure 1 – Software representation of an initial growth model for *Pinus radiata* in the Central North Island of New Zealand. The pink (diamond) and black (triangle) lines represent the response from planting seedlings with 8 mm RCD while the red (square) and green (circle) lines represent the response from planting 4 mm seedlings. Pink and red lines also represent the gains from the site preparation treatment that involves ripping, mounding, and fertilization with DAP. Black and green lines represent sites with no mounding. The IGM-2 results indicated that in some parts of NZ, gains in height growth from planting 8 mm RCD seedlings are greater than that from mounding, ripping, DAP fertilization, and planting seedlings with 4 mm RCD.



Stem Sinuosity After Planting (part 2)

David South

The Fall 2002 newsletter had an article regarding first-year sinuosity of outplanted pines (as reported by Murphy and Harrington 2002). Second-year data from this study were published in Michael Murphy's M.S. 2004 thesis entitled "The influence of taproot shape on stem form in loblolly (Pinus taeda L.) and slash pine (Pinus elliottii Engelm.). This UGA study involved five taproot treatments and three full-sibling families. One-fifth of the seedlings were planted with a J-root while others were planted with an I-root or were planted at an angle. As expected, the fast-growing family had the greatest sinuosity at age two. Taproot treatments had no significant effect ($p=0.05$) on second year diameter, height, stem biomass or sinuosity (reported as frequency and amplitude). However, for the amplitude portion of sinuosity, there was a significant family by treatment interaction. For I-roots, J-roots and for seedlings planted at a 45-degree angle, the fastest growing family had the greatest amplitude and the slowest growing family had the lowest amplitude. For seedlings bent and guy-wired after planting, the intermediate-growing family had the greatest amplitude and for seedlings planted over an obstruction (plastic placed 10 inches below the surface), the slowest growing seedling had the greatest amplitude.

A second UGA taproot study was installed at 6 sites in Georgia. Root depth (distance between groundline and deepest point of the roots after planting) was not recorded but root depth (i.e. distance from surface to deepest root) for J-roots and L-roots is assumed to be half that for I-root seedlings (roots were bent midway on the taproot). In a recent review of tree planting methods (Tree Planters' Notes 51:53-67), it was shown that root depth (or hole depth) can have a greater impact on seedling survival than J-rooting, per se. In the UGA study, there was no discernable pattern of root shape on seedling survival (but statistics were not reported). At five of the sites, there was no significant effect ($a=0.05$) of root form on DBH or height growth. At one site, the trees planted with bent roots had slightly greater DBH and greater height growth than seedlings planted with I-roots. On two sites, sinuosity was greater with bent roots than with I-roots (i.e. frequency was greater with J-roots on one site and amplitude was greater with L-roots at another site).

Root Bound Index (RBI)

David South

I was looking on the web the other day and ran across the "Interim guidelines for growing longleaf seedlings in containers" (GTR SRS-60). Although it

seems to be a typographical error, the specifications on the web say the "preferred" root collar diameter (RCD) should be "1 inch or more." This means the ROOT BOUND INDEX (defined as the RCD/cell diameter) would be 50% if the container cell diameter was 2 inches and the RCD was 1 inch!

For years we have said that bareroot seedlings with bigger RCD and larger root mass have a higher probability of survival than tall skinny seedlings. However, for container-grown seedlings, there appears to be a RCD limit which is determined by cell diameter or container volume. We recently published data that shows longleaf pine roots can get too big for the container. In Alabama, field performance of longleaf pine was reduced when the RBI exceeded 27% (RCD/cell diameter). If you are interested in this topic, you may download the longleaf paper from www.srs.fs.usda.gov/pubs/8456

While in South Africa last year, I learned that researchers with Sappi Forests had determined that root-binding could occur with other pine species. We pooled our data and presented a paper at the Thin Green Line conference in Canada. Our paper on this topic can be downloaded from www.rngr.net/Publications/tgl/a-root-bound-index-for-container-grown-pines/file

As a side note, we plugged in the term "root bound index" (term includes quotes) in Google Scholar and it retrieved only one paper. If more research is conducted on root binding of container-grown seedlings, then perhaps the number of papers flagged by Google Scholar will increase in the future.

A Shorter Lifting Season

David South

The lifting window begins when harvesting commences in the fall and it ends when the last seedling is harvested in mid-to late winter. There are two lifting windows for pine seedlings. When seedlings are planted within a few days of lifting (ie. "hot-planted"), lifting can begin in October and this window may be 5 months long (October-February). However, for stored seedlings, the window may be only 2 months long (January-February).

Quote of the Day

Clonal seedlings that cost significantly more than orchard seedlings will become an obstacle to the implementation of any cloning technology.
This economic reality cannot be ignored.

George H. Weyerhaeuser Jr.

When seedlings are stored, outside temperatures can affect the lifting window. For example, Gulf Coast nurseries have shorter lifting-windows for storage than interior nurseries with latitudes greater than 35 degrees. When winter months are unusually warm, seedlings may begin to elongate several weeks early (which shortens the lifting window). Genotype also affects the lifting window. Many loblolly pine genotypes have been selected for greater height growth and therefore some second-generation families start height growth earlier in the nursery. A number of nursery managers have noticed second-generation sources elongating earlier than first-generation seedlings. In some years, the combination of warmer winters and fast-growing genotypes has resulted in a shorter lifting window.

Dry falls can also affect the lifting window by delaying the starting date. In some years, both droughts (on the front end) and warm winter weather (on the tail end) will shorten the lifting window for both "hot" and "cold" lifting. Whoever said the life of a nursery manager was easy?

IPM

David South

Integrated Pest Management is a system that combines cultural, biological and chemical technologies to reduce insect, fungal and weed populations to levels below those that result in economic damage. We currently use many IPM practices to control pests of southern pine seedlings. Since 1970, new chemical, cultural, and biological pest control practices have been tested by the Coop and, as a result, we have reduced the total costs associated with pest control.

As the value of tree seedlings increases, the economic thresholds for applying pest-control measures decrease. Therefore, when we grow stock worth 42 cents each, there will likely be an increase in pest control treatments. However, since the statistical power of most trials in bareroot nurseries is low, the likelihood of experiments that detect "real" treatment difference (e.g. those that consistently increase seed efficiency to the point where economic returns are affected) will be low. There have been cases where a pest-control treatment increases seed efficiency but some researchers will claim the increase is only due to chance.

Most managers will use a treatment that has a benefit/cost ratio of 20, even if the power of the statistical design employed by a researcher was so low that significant F-values were not detected. For most nursery managers, the benefit/cost ratio is more influential than results from a pesticide test that has low statistical power. A paper on this topic,

"Integrated Pest Management Practices in Southern Pine Nurseries," was published in New Forests (31:253-271) and can be downloaded from the "Publications" link on the Coop webpage.

Technical Note on Freeze Injury

David South

Freeze injury to pine roots can be classified into three groups: pre-acclimation, acclimation, and deacclimation. Pre-acclimation injury (PAI) typically occurs during fall or early winter. PAI occurs before seedlings have been exposed to a sufficient amount of chilling temperatures. Acclimation injury (AI) affects seedlings after they have been acclimatized by short days and low temperatures. Deacclimation injury (DI) occurs after acclimation (or partial acclimation) has occurred and after a sufficient amount of warm nighttime temperatures has stimulated a resumption of cell division. Although a DI freeze occurs mainly in early spring (during or just before shoot growth), it sometimes occurs in the winter when unusually warm temperatures have stimulated cambial activity. Technical Note 05-01 entitled "Freeze Injury to Southern Pine Seedlings" documents several DI freezes and this note can be downloaded from the "Publications" section of the Coop webpage.

White Grubs

Scott Enebak

White grubs are the immature insects of the May or June beetles which feed on the roots of many plants including seedlings. Twice I have observed severe white grub injury in seedlings, typically later in the growing season, and both times when a nursery tried to squeeze a third crop from a fumigated field. This is not to say that white grubs don't occur in the first or second crop, only that by the third year post-fumigation, the C-shaped larvae have grown enough in size and numbers that root feeding damage can result in above-ground symptoms.

Understanding the life cycle of this insect will help nursery managers cope with this pest. Depending upon nursery location, the white grub life cycle ranges from 1-4 years (egg to adult) and tends to be shorter as you move south, longer as you move north. You will tend to see white grub infestations near the edges of nurseries that have *Quercus* nearby. The adults feed on oak leaves and the insects are poor flyers, so they don't go far to lay their eggs. After mating, the adult female May/June beetle lays her eggs in the soil and, after hatching, the larva feed upon the root systems of the seedlings during the growing season. First-year larva tend to be small and the damage is typically not observed. In the fall, the seedlings are lifted and the larva bury deep into the soil to hibernate over the winter. In the spring, seed is sown, seedlings begin to germinate and the larva, much larger now, move up the soil and again feed upon the seedling roots. At the same time, newly laid eggs are hatching and there are now two generations of white grubs feeding on seedlings. If populations are high, damage might be observed in small patches towards the end of the second season.

It has been my experience that white grub problems arise in those situations where the nursery is trying to get a third year out of the fumigation. The second crop of seedlings are lifted and the larva again bury deep into the soil to overwinter. In the spring, the area is sown to seedlings and the larva move up in the soil profile to feed. In these situations, there are 1-yr old white grubs, 2-yr old white grubs and 3-yr old white grubs which are larger, hungrier and feed on seedling roots to a point where I get called for "a white grub problem." When a field is kept for a third year, the relative size and numbers of white grubs builds up to a point where some type of remedial action needs to be taken. Severe losses can occur in nurseries where white grub populations are greater than 1 larva per square foot of soil surface.

In a normal 2-2 cycle, the white grubs are controlled by the fallow period and subsequent fumigation so that insect numbers and insect size does not develop to a point that would result in observable damage above ground. In cases where white grubs pose a problem for seedling production, there are EPA labels that contain chloropyros that can be used in nurseries as a soil drench. Copies of two EPA labels can be found at the Coop webpage under the "Labels" link.

OTHER NEWS

Tour Descriptions for SFNA meeting July 2006 at Tyler, TX

Harry Vanderveer

Texas Forest Service-Indian Mound Nursery, Alto, TX (Wednesday, 7/12/06)

The Indian Mound Nursery is probably the oldest, continually operated forest seedling nursery in the southern United States. The nursery gets its name from the 30-foot high Indian Mound that sits on the north side of the property. The L-shaped mound is believed to have been a place of worship for the Caddo nation—a Native American tribe that once flourished in this area. The sacred mound is believed to have been established around 1000 A.D. In 1940 the Texas Forest Service selected the site for a

seedling nursery. The original nursery consisted of 73 acres, with 40 acres in seedling production. Expansions in the 1970's and 1980 have brought the nursery to a total of 321 acres with 115 irrigated production acres, managed on a 2:2 rotation. The nursery has produced well over one billion pine seedlings in the years since it began. Currently, the nursery grows loblolly, shortleaf and Virginia pines, as well as over 35 species of assorted hardwoods and a half million container longleaf pines annually. These trees are sold to landowners in East Texas. You can take a glimpse of our online information catalog at: http://texasforestservice.tamu.edu, then click on **TFS Seedling Store** to take a virtual tour of Indian Mound.

International Paper Nursery (Tuesday, 7/11/06)
The Texas SuperTree Nursery was established by International Paper in 1981. Totaling 140 acres, this nursery produces 45-50 million pine seedlings annually on a 2/2 rotation. Species produced include loblolly pine, slash pine and Virginia pine.

International Paper Seed Center (Wednesday, 7/12/06)
The group will travel to Douglass, Texas to tour the Forest Seed Center (FSC) and Nacogdoches Seed Orchard complex. Established in 1980 by International Paper, the FSC includes seed processing equipment, a seed testing laboratory, seed storage freezer, and a seed stratification cooler. The orchard complex includes 8 acres of advanced generation orchard established in 1988 and expanded to 20 acres in 1993. A second advanced generation orchard of 20 acres was established in 1998.

Agtoprof and Kiepersol (Tuesday, 7/11/06)
Agtoprof, Inc. specializes in the development and management of small and large income-producing farmland, with the primary emphasis on permanent crops such as almonds, cherries, apples and vineyards. Agtoprof emphasizes the art of farming and over the years has developed a comprehensive information system to support the operations. This system provides timely and accurate support and guidance to every Agtoprof manager. The business aspects of corporate farming are handled out of the corporate office at Tyler, TX by corporate professional, leaving the on-site managers free to concentrate on actual everyday farming activities. For a peek into the organization of Agtoprof, check out their website at: www.agtoprof.com.

While visiting Agtoprof, we will also enjoy a visit to "the land of beef and wine," Kiepersol Estate. Kiepersol boasts an award-winning vineyard and winery, as well as a fine restaurant and bed & breakfast accommodations. There are also several residential communities being developed that offer good, clean country living with great amenities. Kiepersol Estates prides itself on breeding only the highest quality genetics into their herds. Their fine line of proven champions clearly shows the genetic difference. Have a look around Kiepersol Estates online at www.kiepersol.com.

Other program highlights:
- Nursery labor from both the corporate and contractor's points of view
- Homeland Security and Nursery Operations
- Disease issues in forest nurseries
- Four-legged pests around nurseries
- Nursery equipment and technology developments
- Pesticide registrations
- National Tree Seed Laboratory report
- Hurricane recovery and the role of forest nurseries
- Biomass and carbon sequestration: where do nurseries fit in?
- Methyl bromide QPS/CUE and alternatives

A note from John Taylor, IPM Specialist and EPA contact with respect to pesticide issues:

"Thanks so much to all of y'all who took time to help us answer and explain forestry needs to EPA yet once again! I can tell you that your answers really made a difference…"

Contact us!

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