

# ANNUAL REPORT

## FY 2013

(October 1, 2012 - September 30, 2013)

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# AUBURN UNIVERSITY – FOREST HEALTH COOPERATIVE

## MEMBERSHIP LIST

(FY 2013)

### Full Members:

#### **Federal**

United States Forest Service

#### **Forest Industry**

Hancock Forest Management

Plum Creek Timber Company

Rayonier

Resource Management Service

Westervelt

Weyerhaeuser

### Associate Members:

#### **Forest Industry**

Delaney Development

Molpus Timber Management

Scotch Lumber Company

#### **Non-Industrial – Private**

ArborGen, LLC

### Maintaining Members:

#### **Consulting Foresters**

F & W Forestry

### Sustaining Members:

#### **Non-Industrial – Private**

Alabama Farmers Federation

Burgin Land

International Paper

Forestry & Land Resource Consultants

#### **Individual Foresters**

Beth Richardson

#### **State**

Alabama Forestry Commission



# AUBURN UNIVERSITY – FOREST HEALTH COOPERATIVE

## Advisory Board Chairman

**Service Rotation<sup>†</sup>**

(November 2013)

<b><u>FISCAL YEAR<sup>†</sup></u></b>	<b><u>Chairman*</u></b>
2011	Westervelt
2012	Weyerhaeuser
2013	US Forest Service
<b>2014</b>	<b>Hancock Forestry</b>
2015	Plum Creek
2016	Rayonier
2017	Resource Management Service
2018	Westervelt
2019	Weyerhaeuser
2020	US Forest Service
2021	Hancock Forestry
2022	Plum Creek
2023	Rayonier
2024	Resource Management Service

<sup>†</sup>Member will conduct the Coop business meeting held in that **fiscal year**.

\*First Chairman randomly chosen for FY2011, subsequent Chairman will be alphabetical by company name.



# AUBURN UNIVERSITY – FOREST HEALTH COOPERATIVE

Due to the nature of the members and the appearance of possible impropriety these rules are in place.

## THE EIGHT FUNDAMENTAL RULES OF ANTI-TRUST COMPLIANCE

1. Competitors may not agree on prices they charge for goods they sell.
2. Competitors may not agree on the prices they charge for services.
3. Competitors may not agree on terms of sale.
4. Companies may not use dominant market position to monopolize a market, control prices, or exclude competitors.
5. Competitors may not agree not to compete by allocating customers, territories, or markets.
6. Competitors may not agree not to compete on bids – i.e. bid-rigging.
7. Competitors may not agree on prices for products or services they buy.
8. Competitors may not join in a boycott of suppliers or customers to accomplish anti-competitive ends.





# Rules and Policies for Auburn University Forest Health Cooperative

Re-Approved February 1, 2011

## MEMBERSHIP

1. Membership in the Forest Health Cooperative (FHC) is open to anyone in the southeastern region of the United States.
2. Members are required to pay annual dues which are as follows:

Full Member	\$10,000
Associate Member	\$ 5,000
Maintaining Member	\$ 2,500
Sustaining Member	\$ 500
3. Sustaining Members receive access to FHC Webpage, annual Newsletter, Priority Email and Telephone Consulting, and participation in Members Only Workshops and may participate at the Annual Advisory Meeting, but cannot serve on the Advisory Council. Maintaining Members receive the benefits of Sustaining Members, and Research and Technical Reports. Associate Members receive the benefits of the Maintaining Members, and Field Consulting and Laboratory Diagnostics. Full members receive all the benefits of Associate, Maintaining and Sustaining Members and serve on the Advisory Council and have full voting powers with respect to research program and budgetary decisions.
4. Membership is for one year beginning October 1. Membership may be terminated by either the member organization or by Auburn University by giving 60 days written notice before October 1.
5. Membership will be contingent on signing a memorandum of agreement with Auburn University.
6. After September 30, 2009, all new members at all levels will be required to contribute 1-3 x their annual membership dues in addition to their annual membership dues. The number of annual contributions will depend upon the year of membership beyond 2008.

Year of Joining	Contributions to Forest Health Cooperative
2008	1 Annual Membership
2009	1 Annual Membership + 1 Annual Membership
2010	1 Annual Membership + 2 Annual Membership
2011 and beyond	1 Annual Membership + 3 Annual Membership

## ORGANIZATION

1. The Dean, School of Forestry and Wildlife Sciences, Associate Director Agricultural Experiment Station of Auburn University in consultation with the Forest Health Cooperative Executive Committee, will appoint the Forest Health Cooperative's Director.

The Director will be responsible for:

- A. Directing the activities of the Forest Health Cooperative;
  - B. Employing a competent staff;
  - C. Developing the Forest Health Cooperative's direction in conjunction with the Advisory Council;
  - D. Ensuring each member participates to a threshold level; and
  - E. Reporting research accomplishments to the Advisory Council
2. The Advisory Council will have an annual meeting in the first quarter of each fiscal year.
  3. An Advisory Council consisting of one representative from each full member shall be established to:
    - A. Act as a liaison between the organization and the Director;
    - B. Develop Forest Health Cooperative policies;
    - C. Advise the Director on the Forest Health Cooperative's direction;
    - D. Approve the annual budget and membership fee.
  4. An Executive Committee consisting of three Advisory Council members and the Director shall have the authority to meet and conduct routine business in the name of the Advisory Council. One Executive Committee member will be appointed annually according to a rotating schedule and will serve for 3 years. The Advisory Council chairman will be the senior member of the Executive Committee and will preside at the Executive Committee and Advisory meetings.
  5. Contact representatives will be designated by each cooperating member/organization. This individual may or may not be the same person serving on the Advisory Council. Contact Representatives will be directly involved in research established with each member organization.
  6. All information will be available to all members in the Forest Health Cooperative.

7. All members agree to keep confidential the data and information given to them for future publications and limit the spread of information to non-members that would benefit without paying annual FHC dues.

## DUES and BUDGET

1. Membership dues will be set by the Advisory Council at its annual meeting.
2. The Cooperative will operate on the fiscal year October 1 to September 30. Invoices for membership fees will be sent to all member organizations on October 1 of each year, or by special arrangement with the individual organization.

## RULES CHANGES

1. Changes in, deletions from, and additions to the membership rules may be adopted by a two-thirds vote of advisory members in attendance at regularly scheduled or special sessions of the Advisory Council.

## DIVISION OF RESPONSIBILITIES BETWEEN AUBURN UNIVERSITY AND MEMBER ORGANIZATIONS IN THE AUBURN UNIVERSITY FOREST HEALTH DYNAMICS LABORATORY COOPERATIVE

1. Study plans will be developed by Auburn University in conjunction with the Cooperative's Advisory Council. Responsibilities for cooperative research will be delineated in individual study plans.
2. Auburn will do data analysis and processing, as well as manuscript preparation, and will insure timely distribution of results to cooperators.
3. Auburn University graduate students will be utilized to work on specific forest health problems.
4. All cooperators will be responsible for adhering to the study plans.
5. Information will be disseminated at annual Advisory meeting and in an annual Newsletter and Research Reports to members. A web site dedicated to Forest Health with the Cooperatives' research will be maintained by School of Forestry & Wildlife Sciences.
6. Results will also be disseminated at local, regional and national forest related meetings.

7. Site visits for risk assessment and diagnostic evaluations will be conducted by Auburn University staff. Full members get 2 days/yr, Associate Members get 1 day/ yr. Additional days are \$1000 per day for all membership classes.
8. Laboratory diagnostic evaluations will be conducted by Auburn University staff. Full members get 10 sent in samples per year; Associate Members get 5 sent in samples per year. Additional samples are \$100 per sample for all membership classes.

# AUBURN UNIVERSITY – FOREST HEALTH COOPERATIVE

## FY14 ADVISORY MEETING AGENDA

Wednesday – June 25, 2013

<u>TIME</u>	<u>EVENT</u>	<u>SPEAKER</u>
11:00 – 1:00	Registration	Elizabeth Bowersock
1:00 – 1:05	Introduction – Welcome	Dr. James Shepard – SFWS Dean
1:05 – 1:10	Housekeeping	Dr. Lori Eckhardt
<i>Forest Health Dynamics Lab Project Updates</i>		
1:10 – 1:20	Forest Health Cooperative Diagnostics Laboratory Update and Sudden Oak Death Survey Laboratory Update	Alyssa Rosenblum – Forestry Technician
1:20 – 1:40	Mapping spores on intact bark beetles using CytoViva Hyperspectral Imaging	Dr. Lori Eckhardt – Director
1:40 – 1:55	Field evaluation of a controlled vapor delivery method in an IPM system for loblolly pine	Kathryn Fuller – Lab Technician
1:55 – 2:10	RW19 Update – GA and LA	Martha Priester – Forestry Technician
2:10 – 2:40	Central America Project Update	Dr. Lori Eckhardt – Director
2:40 – 3:00	Invasive Species Update	Dr. Nancy Loewenstein – SFWS
<b>3:00 – 3:30</b>	<b>BREAK</b>	
3:30 – 4:00	Interactions of future climate change scenarios of elevated tropospheric ozone and decreasing rainfall amounts with loblolly pine decline	Jeff Chieppa – MS Student
4:00 – 4:30	Resistance of <i>P. taeda</i> families: Year 2 Update	Dr. Lori Eckhardt – Director

4:30 – 5:00	Wood Chemistry and Disease Resistance	Dr. Brian Via – SFWS
<b>5:00 – 5:30</b>	<b>Screening loblolly pine families for chemistry and stiffness</b>	Gifty Acquah – PhD Student
<b>6:00 – ???</b>	<b>BBQ DINNER AND SOCIAL</b>	

**Thursday – June 26, 2012**

<u><b>TIME</b></u>	<u><b>EVENT</b></u>	<u><b>SPEAKER</b></u>
<b>7:30 – 8:30</b>	<b>Breakfast</b>	
8:30 – 10:30	Science Meeting	Dr. Lori Eckhardt
<b>10:30 – 10:45</b>	<b>BREAK</b>	
10:45 – 11:30	Business Meeting	Dr. Lori Eckhardt
11:30 – 12:00	Budget Review	Dr. Lori Eckhardt
12:00	Adjourn – Have a Safe Trip Home!	

# AUBURN UNIVERSITY – FOREST HEALTH COOPERATIVE

## FY 2014 ADVISORY COMMITTEE MEETING

June 25 and 26, 2013

### MINUTES

#### **FY 2014 Proposed Work Plan**

Discussion on the FY 2014 Proposed Work Plan began at 9:00 am on June 26, 2013, after the members conversed over breakfast.

#### **Goal A: Research**

##### **Objective 1: Identify research projects**

Dr. Eckhardt summarized the proposed research projects for the upcoming fiscal year. No discussion was held for Work Plan Proposals #1 thru #6 or Newly Funded #1 thru #4.

There were questions about the CAFS proposal in which the Coop applied. The proposal was returned with request for more information and we should hear Feb - Mar 2014 about funding.

##### **Objective 2: Recruit graduate students**

Dr. Eckhardt discussed the ongoing process of seeking graduate students for upcoming studies. Coop members approved and no further discussion was held.

##### **Objective 3: Initiate and continue research projects:**

Dr. Eckhardt summarized the research that is to continue and the work that is yet to be completed. Coop members approved and no further discussion was held.

#### **Goal B: Technology Transfer**

##### **Objective 1: Serve as a clearing house...**

Dr. Eckhardt described the past efforts and future plans for the Forest Health Cooperative to become the storage location of forest health related data. Coop members approved and no further discussion was held.

##### **Objective 2: Efficiency and regularly transfer...**

Dr. Eckhardt described the past efforts and future plans for the dissemination of coop funded research to the coop members through research reports and newsletters. Coop members approved and no further discussion was held.

##### **Objective 3: Provide a limited consultancy...**

Dr. Eckhardt described the services available to coop member and the rates associates with those services for field visits and the processing of diagnostic samples. Dr. Eckhardt then reminded coop members about the upcoming short course for 2014 and 2016.

### **Goal C: Coop Development**

#### **Objective 1: Provide a continual relevancy ...**

The Forest Health Cooperative meeting was agreed to be held on June 24<sup>th</sup> - 26<sup>th</sup> 2014.

Discussion was held on increasing coop membership and Dr. Eckhardt summarized her efforts to increase membership. Coop members approved and no further discussion was held.

#### **Objective 2: Increase the visibility and effectiveness...**

Dr. Eckhardt summarized the past efforts and future plans for student and professional presentations and listed the publications associated with Forest Health Cooperative funded research.

A discussion was held concerning the continuation of the family resistance screening study for FY2014 and members agreed that the study would be worthwhile and would seek approval.

Alan Wilson (Rayonier) made the motion to vote on Work Plan for FY2013 and it was seconded by Philip Johnson (Delaney). The work plan was approved by a vote of 6 “yea”, 0 “nay” and 0 abstaining.

### **FY2013 Accomplishments**

Dr. Eckhardt summarized the accomplishments for FY2013 including the acquisition of funding for the continuation or inception of five research projects. Dr. Eckhardt discussed the progress on completed studies, Amritpal Singh’s study of family resistance to ophiostomatoid fungi and Ben Brunson’s study of the relationship of cogongrass to insect and pathogens associated with pine decline. Dr. Eckhardt also summarized the scope of the published research work for FY2013. Coop members approved and no further discussion was held.

### **FY2013 Budget**

Dr. Eckhardt provided clarification on the progression of the FY2013 budget and highlighted the carryover amount for the next budget year.

### **Adjournment**

The meeting was adjourned at 12:30 pm on June 26, 2013.



# AUBURN UNIVERSITY – FOREST HEALTH COOPERATIVE

## SCIENCE MEETING – OPEN DISCUSSION

June 26, 2013

- How do we manage stands when tests come back positive? What is the best course of action? Native/non-native?
  - Do it when the insect population is low so as not to cause as much of a disturbance. We haven't been able to do a study due to the cost.
- We need to have a database of stands with problems, treatments, results, etc. (without location or company listed). We could use codes instead of company names; only the director would know true identities.
- Shouldn't we split dollars for study like fusiform rust?
  - We should because it's not going to be controlled only with management. Look at genetic side of things. We think what we're doing makes sense, but we really have no science to back it up.
- We need more contact with other cooperatives and a better structure of studies.
- How much are we actually screening now? (30-35 families) Any clones? (We can add some; make a 2-3 year plan... Definitely need to think about next steps with genetics.)
- What about fungus in the soil? A lot of beetles?
  - Not in the soil – in the roots, brought by beetles. Beetles are attracted back to the fungus.
  - So we can't inoculate the soil then? (No, it needs living tissue. The fungus is on the beetle's body – symbiosis cycle.)
- What about John Davis's "pine map"? Can we add genetic component? Who else should we talk to? (Dana Wilson, John Johnson, Tim Martin, Florida Cooperative... Gary Peters?)

- How many sites? Focus on AL/GA?
- Forest Service response has always been that we “catch too many (beetles)” and “they are not a problem.” (Pineville – Yes, it’s a problem... Atlanta – No, it’s not a problem... Asheville – No, it’s not a problem...) These are all opinions and it depends on who you ask!
- What is the plan of action for a genetic study?
  - Depends on how we want to do it... Continue same as we do now or do a progeny trial....
- If inoculating roots is a problem for size, why not dump beetles into a bucket and let them do it for you?
- What is our strategy for the next five years?
  - Hopefully we’ll have more of a genetics side to research. It all comes down to getting money to pay for these projects.
- We need to hold contact meetings close to company lands so we can actually see some of the issues.
- We need a standard procedure/sampling process.
- Fall field tour? Host around Eufaula in September or October?

# AUBURN UNIVERSITY – FOREST HEALTH COOPERATIVE

## FY2013 BUDGET - PROJECTED VERSUS ACTUAL (October 2013)

FISCAL YEAR  
(Oct. 1, 2012 - Sept. 30, 2013)

	<u>FY13</u> (Projected)	<u>FY 13</u> (Actual)	<u>Difference</u>
<b>REVENUE</b>			
Carryover from Previous Year	80,526	80,526	0
Current Year's Income	86,000	76,930	(9,070)
<b>Total Revenue</b>	<b>166,526</b>	<b>157,456</b>	<b>(9,070)</b>
<b>EXPENDITURES</b>			
<b>Personnel Costs</b>			
Professional/Non-Faculty	10,314	7,614	2,700
Technician/Staff	13,700	3,854	9,846
Graduate Assistants	15,540	0	15,540
Other Personnel (Student Wages)	23,140	10,573	12,567
Employee Benefits (ESTIMATED)	7,005	3,727	3,278
<b>Total Personnel Costs</b>	<b>69,699</b>	<b>25,767</b>	<b>43,932</b>
<b>Operating Costs</b>			
Travel/Vehicle Mileage	12,000	2,656	9,344
Supplies/Equipment	8,000	16,745	(8,745)
<b>Total Operating Costs</b>	<b>20,000</b>	<b>19,401</b>	<b>599</b>
<b>Total Expenditures</b>	<b>89,699</b>	<b>45,169</b>	<b>44,530</b>
<b>CARRYOVER FOR NEXT YEAR</b>	<b>76,827</b>	<b>112,288</b>	<b>35,460</b>

# AUBURN UNIVERSITY – FOREST HEALTH COOPERATIVE

## THREE YEAR FINANCIAL STATEMENT

(October 2013)

FISCAL YEAR			
October 1 - September 30			
	<b><u>FY14</u></b>	<b><u>FY15</u></b>	<b><u>FY16</u></b>
	(Projected)	(Projected)	(Projected)
<b>REVENUE</b>			
Carryover from Previous Year	112,288	90,627	59,511
Current Year's Income	95,500	91,000	96,000
<b>Total Revenue</b>	<b>207,788</b>	<b>181,627</b>	<b>155,511</b>
<b>EXPENDITURES</b>			
<b>Personnel Costs</b>			
Professional/Non-Faculty	35,620	37,401	39,271
Technician/Staff	24,400	25,620	26,901
Graduate Assistants	18,100	19,100	19,100
Other	0	0	0
Professional Benefits (ESTIMATED 31%)	18,606	19,537	20,513
GA Benefits (ESTIMATED 2.4%)	434	458	458
<b>Total Personnel Costs</b>	<b>97,161</b>	<b>102,116</b>	<b>106,244</b>
<b>Operating Costs</b>			
Travel/Mileage	12,000	12,000	12,000
Supplies/Equipment	8,000	8,000	8,000
<b>Total Operating Costs</b>	<b>20,000</b>	<b>20,000</b>	<b>20,000</b>
<b>Total Expenditures</b>	<b>117,161</b>	<b>122,116</b>	<b>126,244</b>
<b>CARRYOVER FOR NEXT YEAR</b>	<b>90,627</b>	<b>59,511</b>	<b>29,268</b>

# AUBURN UNIVERSITY – FOREST HEALTH COOPERATIVE

## THREE YEAR FINANCIAL STATEMENT

(October 2013)

(with Technician paid on a grant)

	FISCAL YEAR		
	October 1 - September 30		
	<b><u>FY14</u></b> (Projected)	<b><u>FY15</u></b> (Projected)	<b><u>FY16</u></b> (Projected)
<b>REVENUE</b>			
Carryover from Previous Year	112,288	122,591	92,499
Current Year's Income	95,500	91,000	96,000
<b>Total Revenue</b>	<b>207,788</b>	<b>213,591</b>	<b>188,499</b>
<b>EXPENDITURES</b>			
<b>Personnel Costs</b>			
Professional/Non-Faculty	35,620	37,401	39,271
Technician/Staff	0	25,620	26,901
Graduate Assistants	18,100	18,100	18,100
Other	0	0	0
Professional Benefits (ESTIMATED 31%)	11,042	19,537	20,513
GA Benefits (ESTIMATED 2.4%)	434	434	434
<b>Total Personnel Costs</b>	<b>65,197</b>	<b>101,092</b>	<b>105,220</b>
<b>Operating Costs</b>			
Travel/Mileage	12,000	12,000	12,000
Supplies/Equipment	8,000	8,000	8,000
<b>Total Operating Costs</b>	<b>20,000</b>	<b>20,000</b>	<b>20,000</b>
<b>Total Expenditures</b>	<b>85,197</b>	<b>121,092</b>	<b>125,220</b>
<b>CARRYOVER FOR NEXT YEAR</b>	<b>122,591</b>	<b>92,499</b>	<b>63,280</b>

## AUBURN UNIVERSITY – FOREST HEALTH COOPERATIVE

### INCOME STRUCTURE FY 2014

<b>DUES</b>	Full Member	\$9,500 / year
	Associate	\$4,750 / year
<b>ANNUAL INCOME</b>	Dues	\$ 100,500
	Auburn	\$ 411,438
	External	\$ 674,296
	<b>Total</b>	<b>\$1,186,234</b>

*For every dollar of dues, Coop members receive \$125 of research and technology.*

*\*We are still hoping for some outstanding grants to increase our external dollar amount for FY 2014!\**

AUBURN UNIVERSITY – FOREST HEALTH COOPERATIVE

**INCOME STRUCTURE**

<b>FISCAL YEAR</b>	<b>\$ \$ OF RESEARCH AND TECHNOLOGY PER \$ OF DUES PAID</b>
<b>FY 2008</b>	<b>\$ 41</b>
<b>FY 2009</b>	<b>\$ 59</b>
<b>FY 2010</b>	<b>\$ 62</b>
<b>FY 2011</b>	<b>\$ 69</b>
<b>FY 2012</b>	<b>\$ 78</b>
<b>FY 2013</b>	<b>\$108</b>
<b>FY 2014</b>	<b>\$125</b>

# FY 2013 ACCOMPLISHMENTS

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As presented to the Forest Health  
Cooperative Advisory Committee

Dr. Lori G Eckhardt - Director

6/25/2013



# AUBURN UNIVERSITY - FOREST HEALTH COOPERATIVE

## FY 2013 WORK PLAN

### GOAL A: RESEARCH

#### Objective 1. Identify research projects

Testing of a rapid PCR Screening test for the presence of *Fusarium circinatum*, the causal agent of pitch canker on pine planting material – FHM for supplies, travel and postdoc.

- *Accomplishments: Funded by USFS Forest Health Protection grant.*

Identification of Climate Effects on Microbial Symbionts of Longleaf Pine - in collaboration with CERL personnel and University of Mississippi for all travel and supplies.

- *Accomplishments: Funded by ERDC-CERL.*

Interactions of future climate change scenarios of elevated tropospheric ozone and decreasing rainfall amounts with loblolly pine decline.

- *Accomplishments: Funded by HATCH.*

Identification of cogongrass effects on microbial symbionts and physiological vigor of loblolly pine.

- *Accomplishments: Funded by SFWS.*

Forest health evaluation of stand health in association with biomass removal and standard silvicultural practices – FHP, USFS for all travel, supplies and student worker.

- *Accomplishments: Refunded by USFS National Forest System.*

Sudden Oak Death (*Phytophthora ramorum*) Detection Survey (Stream Sampling) in AL and MS – FHM, USFS for all travel, supplies and laboratory technician

- *Accomplishments: Refunded by USFS Forest Health Monitoring grant.*

Wood chemistry and disease resistance – SFWS, Forest Products Development Center.

➤ *Accomplishments: Funded by Forest Products Development Center*

Field evaluation of a controlled vapor delivery method in an integrated pest management system for citrus and loblolly pine – AU-IGP in collaboration with AU Chemical Engineering

➤ *Accomplishments: Funded by AU OVPR.*

Root disease model to determine how pine decline and annosum root rot interact – SFWS for travel, supplies, graduate student stipend.

➤ *Accomplishments: Funded by SFWS.*

Mycorrhizal fungal colonization and disease resistance – SFWS and University of Mississippi for all travel, supplies and graduate student stipend.

➤ *Accomplishments: Funded by SFWS and University of Mississippi.*

*Pinus* related diseases and molecular aspects - Collaboration between SFWS and FABI – University of Pretoria South Africa for travel and supplies and a graduate student stipend at UP.

## **Objective 2. Recruit graduate students**

There are two openings for a graduate student in the Coop:

1. Open - Resistance of *Pinus taeda* families under artificial inoculations with native and non-native *Leptographium* species involved in premature mortality.

➤ *Accomplishments: Search underway*

2. Open – Root disease model to determine how pine decline and annosum root rot interact.

➤ *Accomplishments: Search underway*

3. Closed - Interactions of future climate change scenarios of elevated tropospheric ozone and decreasing rainfall amounts with loblolly pine decline.

➤ *Accomplishments: Jeff Chieppa (MS Student) started January 2013.*

4. Closed - Identification of cogongrass effects on microbial symbionts and physiological vigor of loblolly pine.

➤ *Accomplishments: Adam Trautwig (MS Student) starting August 2013.*

**Objective 3. Initiate research projects: Determine location, cooperators, and set up research plots dependent upon projects chosen by the membership.**

*Hylastes* population dynamics and forest health evaluation in association with thinning and harvesting. Plots have been installed in Georgia on Rayonier and F&W properties, in Alabama on Weyerhaeuser, Westervelt and Sizemore & Sizemore properties.

➤ *Accomplishments: Project completed and Yuan Zeng graduated May 2012. Two manuscripts currently in review and Research Reports being completed.*

Cogongrass and ecologically based weed management strategies: Impacts on insect diversity and pine decline in the southeastern United States. Data about possible research stands is currently being collected. Stands will be visited in December and plots installed in January. Current members with possible available stands are Rayonier, Delaney Development Inc, Sizemore & Sizemore, Forest Investment Associates, and Westervelt.

➤ *Accomplishments: Ben Brunson is finishing his thesis and three Research Reports. Graduation and manuscript submissions expected August 2013.*

Resistance of *Pinus taeda* families under artificial inoculations with native and non-native *Leptographium* species involved in premature mortality. Working with the Tree Improvement Cooperative to determine families to be tested for tolerance/resistance.

➤ *Accomplishments: Year two screening is complete and paper being written. Data is currently being collected and analyzed from the year three screening. Families were chosen and sown at Arborgen nursery in for FY14.*

Mature root inoculation of families from screening study found in the LGEPop study in GA and FL (Study 3 of the Resistance of *Pinus taeda* families under artificial inoculations with native and non-native *Leptographium* species involved in premature mortality under different nutritional regimes project).

➤ *Accomplishments: Research Report being written for 2012 inoculations. More inoculations to be made June 2013 to include families added for the FY14 screening.*

Hylastes population dynamics and forest health evaluation in association with thinning and fertilization on new RW19 in Louisiana – Funding through FHP and FHC.

- *Accomplishments: Plots for the RW-19 study were identified in March of 2011, on land managed by Forest Health Partners in Leesville, Louisiana. Study plots and insect traps were installed in May of 2011, and an initial eight weeks of insect data was collected pre-study thinning treatments. The insect traps were reinstalled in December of 2011, after treatment application and insect data is being processed up to the current collection period. Insect collections will continue until December of 2012. In May 2012, plot data was collected for tree measurements and vigor, root infection, and resin. Year one data is being analyzed for a FY13 Research Report.*

Hylastes population dynamics and forest health evaluation in association with thinning and fertilization on new RW19 in Louisiana – Funding through FHP and FHC.

- *Accomplishments: Plots for the RW-19 study were identified in Spring of 2012, on land managed by Rayonier in Georgia. Study plots and insect traps were installed in the summer, and an initial ten weeks of insect data was collected pre-study thinning treatments. The insect traps will be reinstalled after treatment application. Insect collections will continue for one year once traps are reinstalled. Plot data will be collected for tree measurements and vigor, root infection, and resin summer 2014.*

Evaluation of stand health in association with biomass removal and standard silvicultural practices – Funding through USFS National Forest System and Alabama Power.

- *Accomplishments: Plots identified. Awaiting completion of treatments to install insect traps February 2014.*

Wood chemistry and disease resistance – SFWS, Forest Products Development Center.

- *Accomplishments: Families selected from the screening study and LGEPop on Plum Creek and Rayonier property. Trees cored on Plum Creek property May 2012, currently being processed for NIR in the forest products lab.*

Field evaluation of a controlled vapor delivery method in an integrated pest management system for citrus and loblolly pine – Funded through AU-IGP in collaboration with AU Chemical Engineering.

- *Accomplishments: Plots identified. Install insect traps February 2013. Trapping will continue through June 2013. Data from year one will be analyzed and a Research Report written. Year two data collection will begin February 2014.*

Identification of Climate Effects on Microbial Symbionts of Longleaf Pine - in collaboration with CERL personnel and University of Mississippi for all travel and supplies.

- *Accomplishments: Plots identified. Sampling at Fort Benning and Eglin AFB completed. Sequencing underway at University of Mississippi.*

Interactions of future climate change scenarios of elevated tropospheric ozone and decreasing rainfall amounts with loblolly pine decline.

- *Accomplishments: Seedlings were potted in January (2 susceptible and 2 tolerant families – as determined by the screening trial). Seedlings were acclimated to ozone treatment and were inoculated the week of May 28, 2013. All pretreatment data has been taken and is currently being analyzed.*

Identification of cogongrass effects on microbial symbionts and physiological vigor of loblolly pine.

- *Accomplishments: Graduate student selected. Project will begin in August 2013.*

## **GOAL B: TECHNOLOGY TRANSFER**

**Objective 1.            Serve as a clearinghouse of information related to forest health issues.**

### **Maintain and Update Forest Health Cooperative Web Site**

The Forest Health Cooperative Staff will continue to update the Forest Health Cooperative website for use by Forest Health Cooperative Members. (Eckhardt)

- *Accomplishments: The website is updated. Advisory Agenda's with each speaker's presentation available for Forest Health Cooperative Members. Research Reports and Technical Notes are updated. Changes in Forest Health Cooperative staff updated and current.*

**Objective 2.            Efficiently and regularly transfer the results of cooperative research to the membership.**

### **Research Reports (Staff)**

We plan on producing Research Reports and Technical Notes in FY12 now that research projects are underway.

- ***Accomplishments: Research Report 2013-1 and 2013-5 are on the website and 2013-6 thru 2013-12 will be out before the end of the year.***
- ✓ Zeng, Y. and Eckhardt, L.G. 2013. Thinning and harvesting effects on root-feeding bark beetle populations dynamics in *Pinus taeda* L. plantations in central Alabama and Georgia. Research Report 2013-05. Forest Health Cooperative, School of Forestry and Wildlife Sciences, Auburn University.
  - ✓ Meyerpeter, B.M. and Eckhardt, L.G. 2013. Hazard and risk mapping of loblolly pine (*Pinus taeda* L.) decline in the southeastern United States. Research Report 2013-04. Forest Health Cooperative, School of Forestry and Wildlife Sciences, Auburn University.
  - ✓ Thompson, J.A. and Eckhardt, L.G. 2013. Pretreatment invasive plant survey at the Oakmulgee Ranger District, Talladega National Forest, Alabama. Research Report 2013-03. Forest Health Cooperative, School of Forestry and Wildlife Sciences, Auburn University.
  - ✓ Thompson, J.A. and Eckhardt, L.G. 2013. Efficacy of three insect trap types at the Oakmulgee Ranger District, Talladega National Forest, Alabama. Research Report 2013-02. Forest Health Cooperative, School of Forestry and Wildlife Sciences, Auburn University.
  - ✓ Thompson, J.A. and Eckhardt, L.G. 2013. Bark and ambrosia beetle diversity at the Oakmulgee Ranger District, Talladega National Forest, Alabama. Research Report 2013-01. Forest Health Cooperative, School of Forestry and Wildlife Sciences, Auburn University.

#### **Newletters (Staff)**

Newsletter distribution will be planned for September FY2012. Members are encouraged to submit articles.

- ***Accomplishments: A Spring 2012 Newsletter was sent to all Forest Health Cooperative Members, approximately 20 on the mailing list.***

### **Objective 3. Provide a limited consultancy function to the membership in the area of forest health.**

#### **Individual and Organized Contacts**

An on-going activity and is handled as individual situations and cases arise. (Staff)

	<b>Eckhardt</b>	<b>Anderson</b>	<b>Rosenblum</b>
<b>Phone calls</b>	<b>35</b>	<b>0</b>	<b>2</b>
<b>Letters</b>	<b>2</b>	<b>8</b>	<b>3</b>
<b>Emails</b>	<b>54</b>	<b>10</b>	<b>5</b>
<b>Site Visits</b>	<b>2</b>	<b>3</b>	<b>3</b>
<b>Diagnosis</b>	<b>47</b>	<b>8</b>	<b>3</b>

### **Short Courses**

Forest Health Short Course will be offered in odd years starting with FY2009. Not enough members signed up for the course in FY2009 or FY2011 and if there is enough interest, a Short Course in Forest Health will be planned for August 2013. (Staff)

- *Accomplishments: A short course was held June 2012 at the request of membership with 35 participants. The next short course will be planned for summer 2014.*

## **GOAL C: COOP DEVELOPMENT**

**Objective 1.            Provide for the continual relevancy and efficiency of the Cooperative research and technology transfer programs.**

### **Advisory Committee Meeting**

The FY14 Advisory Committee Meeting will be held the third week in June 2013. A 2 day meeting will be planned. If there are any meetings that conflict with this time frame, let us know and we can try and accommodate Advisory Members. (Eckhardt/Bauman).

- *Forest Health Advisory Meeting held in Auburn on June 25-26, 2014*

### **Forest Health Cooperative Membership**

The Forest Health Cooperative staff should make an effort to recruit new members. (Staff)

- *Looking for new members.*

### **Update the Cooperative Membership Directory**

An on-going activity. (Bowersock/Eckhardt)

- *Accomplishments: Membership directory updated and loaded onto website.*

**Objective 2.            Increase the visibility and effectiveness of the Cooperative as a source of information on issues related to forest health.**

### **Presentations at Meetings**

Forest Health Cooperative staff will continue to be encouraged to participate as a speaker or attendee in regional and national meetings. (Staff)

- *Accomplishments: Forest Health Cooperative Staff gave 9 presentations and published 4 articles on the subject of Forest Health.*

- ✓ Eckhardt, L.G., Bauman, T., Menard, R.D., de Beer, Z.W., Wingfield, M.J., and Sediles, A. 2013. Evaluation of mortality in natural stands of *Pinus oocarpa* and *P. caribaea* in Nicaragua. The Third IUFRO Latin American Congress (IUFROLAT) jointly by The International Union of Forest Research Organizations (IUFRO) and the Tropical Agricultural Research and Higher Education Center (CATIE) and partnered by the Ibero American Model Forest Network (RLABM). San Jose, Costa Rica.
- ✓ Loewenstein, N.J., Enloe, S.F., Eckhardt, L.G., Held, D., and Lauer, D. 2013. Use of prescribed fire, glyphosate and seedling in cogongrass infested longleaf pine stands: impacts on species relative dominance. FLEPPC/SE-EPPC Joint Annual Symposium, Panama City Beach, FL.
- ✓ Enloe, S.F., Loewenstein, N.J., Held, D., Eckhardt, L.G., and Lauer, D. 2013. Use of prescribed fire, glyphosate and seedling in cogongrass infested longleaf pine stands: impacts on cogongrass, species richness and species diversity. FLEPPC/SE-EPPC Joint Annual Symposium, Panama City Beach, FL.
- ✓ Brunson, B., Carter, E., Loewenstein, N., Enloe, S., and Eckhardt, L. 2013. Assessing the impacts of cogongrass (*Imperata cylindrical* (L.) Beauv.) on root-feeding bark beetle populations associated with southern pine decline. FLEPPC/SE-EPPC Joint Annual Symposium, Panama City Beach, FL.
- ✓ Neuman, R.D. and Eckhardt, L.G. 2013. Next-generation volatile compound delivery system for control of insects and insect-borne diseases. Auburn University Research Week, Auburn University, AL.
- ✓ Enebak, S.A. and Eckhardt, L.G. 2013. An overview of forest health research at the forest health dynamics laboratory at Auburn University. Annual Center for Advanced Forest Systems (CAFS) Meeting, St. Simons Island, GA.
- ✓ Chieppa, J., Chappelka, A. and Eckhardt, L. 2013. Interactions of future climate change scenarios of elevated tropospheric ozone and decreased rainfall amounts with loblolly pine decline. 23rd Annual Graduate Scholars Forum. Auburn University, AL.
- ✓ Gougherty, A. and Eckhardt, L. 2013. Assessing the competitive interaction between two groups of pathogenic root fungi. 23rd Annual Graduate Scholars Forum. Auburn University, AL.
- ✓ Kelvin, S., Via, B.K., Jiang, W., and Eckhardt, L.G. 2012. Rapid characterization and determination of wood chemistry and crystallinity index of loblolly pine. Frontiers in Biorefining 2012 Conference, St. Simons Island, Georgia.

## Publications

Forest Health Cooperative staff are encouraged to publish research results in scientific journals. (Staff)

- Eckhardt, L.G. and Menard, R.D. 2013. Pine decline in the southeastern United States and the involvement of bark beetles and Ophiostomatoid fungi. In: *The Ophiostomatoid Fungi: Expanding Frontiers*. American Phytopathological Society Press, USA.
- Eckhardt, L.G. 2013. Black stain root diseases and other *Leptographium* diseases. In: Nicolotti G. and Gonthier P. (eds.) *Infectious Forest Diseases*. CABI Book. Expected publication date Spring 2013.
- Enloe, S.F., Loewenstein, N.J., Held, D.W., Eckhardt, L.G., and Lauer, D.K. 2013. Impacts of prescribed fire, glyphosate, and seeding on cogongrass, species richness and species diversity in longleaf pine. *Invasive Plant Science and Management*. 00:000-000.



- Matusick, G., Menard, R.D., Zeng, Y., and Eckhardt, L.G. 2013. *Root-inhabiting bark beetles (Coleoptera: Curculionidae) and their fungal associates breeding in dying loblolly pine in Alabama. Florida Entomologist. March: 238-241.*

### **Extramural Funding of Forest Health Cooperative Projects**

Forest Health Cooperative staff will continue to be encouraged to locate and generate extramural funding opportunities directly related to forest health. (Staff)

- ***Accomplishments: Forest Health Cooperative Staff were awarded the following grants totaling \$674,296.***
  - ✓ Enebak and Eckhardt. 2013. Testing of a rapid PCR Screening test for the presence of *Fusarium circinatum*, the causal agent of pitch canker on pine planting material – FHM - \$150,000.
  - ✓ Enebak and Eckhardt. 2013. Seedling production and forest health in the Southeastern United States – NSF-CAFS - \$300,000 (\$150,000 to FHC).
  - ✓ Chappelka and Eckhardt. 2013. Interactions of future climate change scenarios of elevated tropospheric ozone and decreasing rainfall amounts with loblolly pine decline – HATCH - \$49,986.
  - ✓ Eckhardt and Enebak. 2013. Sudden Oak Death – *Phytophthora ramorum* surveys - \$36,000.
  - ✓ Hoeksema and Eckhardt. 2013. Identification of climate effects on microbial symbionts of longleaf pine - ERDC-SERL - \$50,000.
  - ✓ Eckhardt. 2013. Biomass thinning effects on *Hylastes* populations – USFS National Forest System and Alabama Power - \$16,810.
  - ✓ Neuman and Eckhardt. 2012. Field trial of a controlled vapor delivery method in an IPM system – AU-IGP in collaboration with AU Chemical Engineering - \$97,000.
  - ✓ Eckhardt. 2013. Root disease model – SFWS - \$64,500.
  - ✓ Hoeksema and Eckhardt. 2013. Mycorrhizal fungal colonization and disease resistance – SFWS and University of Mississippi - \$25,000.
  - ✓ Via and Eckhardt. 2013. Wood chemistry and disease resistance. SFWS - \$5,000.
  - ✓ Eckhardt and Wingfield. 2013 *Pinus* related diseases and molecular aspects. SFWS and FABI – University of Pretoria South Africa for travel and supplies and a graduate student stipend at UP - \$30,000.

# FY 2014 PROPOSED WORK PLAN

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As presented to the Forest Health  
Cooperative Advisory Committee

Dr. Lori G Eckhardt - Director

6/25/2013

# AUBURN UNIVERSITY - FOREST HEALTH COOPERATIVE

## FY 2014 WORK PLAN

### GOAL A: RESEARCH

#### Objective 1. Identify research projects

##### Proposed FY2014:

1. Seedling production and forest health in the Southeastern United States – NSF-CAFS - \$300,000 – *Have received verbal approval but waiting for official notification*
2. Novel analytical tools for the selection of superior loblolly pine genotypes for improved plant health, fuels, and chemicals – NIFA-AFRI for travel, supplies, graduate students and post-doc \$494,377 – *Decision expected July 2013*
3. Rapid assessment tools for the genetic improvement of forest products and bioenergy – HATCH for travel, supplies and graduate student \$50,000 – *Decision expected late summer*
4. Ecology of siricids and fungal associates in southeastern pine forests: potential for biological control and competition – APHIS for travel, supplies and graduate student \$99,493 - *Decision pending dependent upon continuation of funds*
5. Exploring soil microbial communities as mediators of complex threats to southern conifers – Agriculture and Food Research Initiative Competitive Grant (3 years) \$497,000 - *Will resubmit fall with modifications if suitable RFP released*
6. Sudden Oak Death (*Phytophthora ramorum*) Detection Survey (Stream Sampling) in AL and MS – FHM, USFS for all travel, supplies and laboratory technician \$36,000 – *Will submit March 2014*

##### Newly Funded FY2013:

1. Testing of a rapid PCR Screening test for the presence of *Fusarium circinatum*, the causal agent of pitch canker on pine planting material – FHM for supplies, travel and postdoc - \$150,000
2. Identification of Climate Effects on Microbial Symbionts of Longleaf Pine – ERDC-CERL in collaboration with CERL personnel (Ryan Busby) and University of Mississippi for all travel and supplies - \$50,000
3. Interactions of future climate change scenarios of elevated tropospheric ozone and decreasing rainfall amounts with loblolly pine decline – HATCH for all travel, supplies and graduate student - \$49,986.
4. Sudden Oak Death (*Phytophthora ramorum*) Detection Survey (Stream Sampling) in AL and MS – FHM, USFS for all travel, supplies and laboratory technician \$36,000

##### Funded FY2013:

1. Field evaluation of a controlled vapor delivery method in an integrated pest management system for citrus and loblolly pine – AU-IGP in collaboration with AU Chemical Engineering for all travel, supplies and student worker - \$97,000
2. Root disease model to determine how pine decline and annosum root rot interact – SFWS for travel, supplies, graduate student stipend - \$64,000

3. Mycorrhizal fungal colonization and disease resistance – SFWS and University of Mississippi for all travel, supplies and graduate student stipend - \$25,000
4. Wood chemistry and disease resistance – SFWS and Forest Products Development Center (to get preliminary data for larger grant) \$5,000
5. Collaboration between SFWS and FABI – University of Pretoria South Africa to work on *Pinus* related diseases and molecular aspects. \$5,000 per participant (3 years)

Funded FY2012:

2. Hylastes population dynamics and forest health evaluation in association with thinning and fertilization on new RW19 in Louisiana – Funding through FHP and FHC
3. Delineating loblolly pine decline in the Southeast using FHM/FIA data – submitted to FHM, USFS for all travel and supplies associated with the project \$35,000 – (Funded Year 2 for \$17,000)
4. Sudden Oak Death (*Phytophthora ramorum*) Detection Survey (Stream Sampling) in AL and MS – FHM, USFS for all travel, supplies and laboratory technician \$47,000
5. Mature root inoculation of families from screening study found in the LGEPop study in GA and FL (Study 3 of the Resistance of *Pinus taeda* families under artificial inoculations with native and non-native *Leptographium* species involved in premature mortality under different nutritional regimes project) – SFWS and Forest Health Cooperative.

## **Objective 2. Recruit graduate students**

Currently searching for masters student for FY2014 starting Fall to continue family screening.

## **Objective 3. Initiate and continue research projects: Determine location, cooperators, and set up research plots dependent upon projects chosen by the membership.**

Cogongrass and ecologically based weed management strategies: Impacts on insect diversity and pine decline in the southeastern United States.

- Complete thesis.
- Submit Research Reports and Manuscripts

Resistance of *Pinus taeda* families under artificial inoculations with native and non-native *Leptographium* species involved in premature mortality.

1. Family screening data being collected and analyzed.
2. Families for FY15 screening will be determined and a growing location needs to be found (Rayonier grew FY11 and FY12 seedlings; Plum Creek grew FY13 seedlings; Arborgen growing FY14 seedlings).

Hylastes population dynamics and forest health evaluation in association with thinning and fertilization.

1. Data collection for the RW19 study in Leesville, LA completed. Data analysis underway.
2. Plots and insect traps installed on the RW19 study in GA (Rayonier and Plum Creek). Data collection underway.

Forest health evaluation of stand health in association with biomass removal and standard silvicultural practices between two land managers.

1. Treatments currently underway. Insect traps will be reinstalled upon completion.

Mature root inoculation of families from screening study found in the LGEPop study in GA and FL (Study 3 of the Resistance of *Pinus taeda* families under artificial inoculations with native and non-native *Leptographium* species involved in premature mortality under different nutritional regimes project).

1. Inoculations and data collection of Plum Creek site (near Nahunta, GA) and Rayonier site (near Yulee, FL) were completed in August 2012. Research Report is being completed.
2. Families chosen for FY14 screen will be checked against LGEPop study to determine if there are more inoculations to take place summer 2013.

Blue-stain fungi associated with feral hogs causing rooting damage in longleaf and loblolly pine stands.

1. Working on manuscripts for publication.

Wood Chemistry and disease resistance.

1. Plum Creek site (near Nahunta, GA) has been cored and being processed for NIR.
2. Rayonier site (near Yulee, FL) has been cored and being processed for NIR.

Field evaluation of a controlled vapor delivery method in an integrated pest management system for citrus and loblolly pine.

1. Year one trapping complete. Data being analyzed. Traps will be redeployed February 2014.

Root disease model to determine how pine decline and annosum root rot interact.

1. Proposal will be written and sites selected for inoculations Spring 2014.

Mycorrhizal fungal colonization and disease resistance.

1. Families selected and growing at Auburn in growth chamber awaiting mycorrhizal inoculation.

## **GOAL B: TECHNOLOGY TRANSFER**

**Objective 1.            Serve as a clearinghouse of information related to forest health issues.**

### **Maintain and Update Forest Health Cooperative Web Site**

The Forest Health Cooperative Staff will continue to update the Forest Health Cooperative website for use by Forest Health Cooperative Members. (Eckhardt)

### **Leveraging Forest Health Cooperative Data**

The Forest Health Cooperative staff will continue to stress the importance of the Cooperative membership and when possible, leverage Cooperative information for grant proposals. (Staff)

**Objective 2.            Efficiently and regularly transfer the results of cooperative research to the membership.**

### **Research Reports (Staff)**

We plan on producing Research Reports and Technical Notes in FY14.

### **Newsletters**

Newsletter distribution will be planned for April (Spring) 2014. Members are encouraged to submit articles.

**Objective 3.            Provide a limited consultancy function to the membership in the area of forest health.**

### **Individual and Organized Contacts**

An on-going activity and is handled as individual situations and cases arise. (Eckhardt/Bauman)

### **Short Courses**

The Forest Health Cooperative will offer a Forest Health Short Course in Auburn for member personnel in July 2014. We need a minimum of 20 attendees and will survey the membership in January 2014 for interest.

## **GOAL C: COOP DEVELOPMENT**

**Objective 1.            Provide for the continual relevancy and efficiency of the Cooperative research and technology transfer programs.**

### **Advisory Committee Meeting**

The FY14 Advisory Committee Meeting will be held on June 25-26, 2014. A 2 day meeting will be planned. If there are any meetings that conflict with this time frame, let us know and we can try and accommodate Advisory Members. (Eckhardt/Bowersock)

### **Forest Health Cooperative Membership**

The Forest Health Cooperative staff should make an effort to recruit new members. (Staff)

### **Update the Cooperative Membership Directory**

An on-going activity with an updated directory distributed annually. (Bowersock)

**Objective 2.            Increase the visibility and effectiveness of the Cooperative as a source of information on issues related to forest health.**

### **Presentations at Meetings**

Forest Health Cooperative staff will continue to be encouraged to participate as a speaker or attendee in regional and national meetings. (Staff)

### **Publications**

Forest Health Cooperative staff members are encouraged to publish research results in scientific journals. (Staff)

### **Extramural Funding of Forest Health Cooperative Projects**

Forest Health Cooperative staff will continue to be encouraged to locate and generate extramural funding opportunities directly related forest health.

### **Interaction with other Research Cooperatives**

The Forest Health Cooperative staff will make efforts to interact, attend, work with other regional and national forest research Cooperatives in an attempt to broaden and strengthen research ties that can benefit forest health.