

Great Plains Tree Pest Council

UNL East Campus Union
Lincoln, NE

April 26-27, 2006

The meeting was called to order by Chairperson, Laurie Stepanek.

Attendees:

Dale Anderson (South Dakota Dept. of Ag)	Ronda Koski (Colorado State University)
Jon Appel (Kansas Dept. of Ag)	Les Koch (Wyoming State Forestry Div.)
John Ball (South Dakota State University)	Kelly Mitchell (Iowa Dept. of Ag)
Anastasia Becker (Missouri Dept. of Ag)	Glenn Petersen (Retired US Forest Service)
Eric Berg (Nebraska Forest Service – 4/26)	Melissa Powers (Kansas Forest Service)
Jim Blodgett (USDA-FS, Rapid City)	Glenn Salsbury (Kansas Dept. of Ag)
Kelly Burns (USDA-FS, Lakewood)	Tom Sanders (Kansas Dept. of Ag)
Bob Cain (USDA-FS, Lakewood)	Bill Schaupp (USDA-FS, Rapid City)
Mark Harrell (Nebraska Forest Service)	Michele Schoeneberger (Nat'l Agroforestry Center)
Jeri Lyn Harris (USDA-FS, Lakewood)	Jessica Smith (South Dakota Dept. of Ag)
Kara Hempy-Mayer (Colorado Dept. of Ag)	Laurie Stepanek (Nebraska Forest Service)
Bill Jacobi (Colorado State University)	Julie Van Meter (Nebraska Dept. of Ag)
Mike Kangas (North Dakota Forest Service)	Jim Walla (North Dakota State University)
Amy Kearney (Montana DNR&Conservation)	Jeff Witcosky (USDA-FS, Lakewood)
Justin Knott (North Dakota Dept. of Ag)	Vicki Wohlers (Nebraska Dept. of Ag.)

Business Items

Listserve Maintenance

A copy of the current Listserve was circulated through the room to ensure that the GPTPC list has the most recent data for all members. Corrections and additions were noted, and the list returned to Laurie Stepanek.

Old Business

Minutes from the 2005 meeting were submitted and distributed by Laurie Stepanek. Motion passed for approval of the old minutes.

New Business

Discussion followed on the subject of creating an archive for reference purposes. Laurie Stepanek volunteered to create a CD containing minutes, major concerns, action items and letters composed on behalf of the GPTPC. The CD will be updated annually and given to the Secretary and Chairperson each year. Any pertinent information should be sent to Laurie.

A website was also discussed by the group. A motion was passed for Jim Walla to create, host and maintain a simple website for the GPTPC on the NDSU server, including the following items: most recent minutes, GPTPC history, constitution and bylaws, purpose of the Council, and upcoming meeting information. Site will also provide contact information for the Secretary and Chairperson. May also contain links to publications and/or participating organizations (USDA, FS, Universities, etc.).

State and Organization Reports

Jim Blodgett & Bill Schaupp – Rapid City USDA-FS

A paper report was distributed to the group. Recent work in the Rocky Mountain Region (R-2) has noted the following:

- A possible canker disease in Buffalo Berry
- Problems with tent caterpillars on the Crow Creek Reservation destroying a foodsource species
- Dutch Elm Disease (DED) is the most commonly coded issue during flight surveys
- A possible decline in *ips* beetles in NE and SD
- Acreages of Bur oak turning orange in September – suggestions of possible insects/pathogens welcome
- Noted nearly 7,000 acres of hail damaged trees from a single storm in August, 2005. *Diplodia* moved in shortly thereafter
- Aerial survey data is available online:
<http://www.fs.fed.us/r2/resources/fhm/aerialsurvey/>

Mark Harrell & Laurie Stepanek – Nebraska Forest Service

A paper report was distributed to the group. Key elements mentioned and discussed were:

- Pine wilt: Nematode is native to the US, tests are being done to evaluate the effectiveness of a nematicide trunk injection. Results look good, but the treatment is very expensive (~\$300 for a 10" DBH tree).
- Ponderosa pine: Pines along the southern edge of the Pine Ridge are declining and dying due to a combination of drought stress and *Armillaria* root rot. Some trees will be selected for monitoring over the next few years, with hopes that trees will begin to recover if moisture levels improve.
- Emerald Ash Borer (EAB): Early detection trapping efforts in 10-12 camping areas used most by out of state visitors will take place this year, using recently cut ash logs covered with sticky material and cardboard sticky traps containing an attractant. A draft action plan for controlling EAB is being drafted.
- Itch Mites: Unknown whether or not the insects are native to the area. Mites are most commonly found around pin oaks, and cause itchy red bites and discomfort in humans. Itch mites have been reported by residents in eastern NE and KS, as well as western MO.

Melissa Powers, Glenn Salisbury & Jon Appel – Kansas Forest Service & KS Dept. of Ag

Brief paper reports were distributed by Melissa and Jon. Key points included:

- Sudden Oak Death (SOD) survey conducted in pertinent areas during August in cooperation with the Lakewood Service Center.
- Drought stress continues to cause tree stress and mortality in western areas of the state. Insect damage is also noted in these areas, but is likely a secondary agent.
- DED continues to take large numbers of trees – trees that were live and healthy 5 years ago already dead and down (based on observations on Forest Inventory & Analysis plots being remeasured).
- Oak health survey conducted by Jon Appel shows that primary agents in tree decline and death are environmental stresses, both abiotic and biotic (drought, flooding, cattle grazing, etc.). Pathogens noted in report include *Hypoxyylon* and *Botryosphaeria* cankers, *Armillaria* and *Polyporous* root rot, oak wilt, Anthracnose and powdery mildew.
- A nematode analysis was performed in windbreaks across Kansas during 2004-5. For more information on data collected, contact Jon Appel: 785.537.3155, jappel@kda.state.ks.us
- Glenn Salsbury reported very good trapping success of exotic wood borers and other insects of interest using canopy traps. A demonstration of a canopy trap was provided during break on 4/27. Importation of insects has been noticed with root-balls of trees coming in from out of state.
- Glenn also offered copies of publications on KS bark beetles and grasshoppers to all interested parties.
- Pitch moth spraying and trapping has been successful in western areas of the state, after returning to a hard rubber septa for the lure. However, the lure that works in western Kansas does not work in the southeast area of the state. Infestation continues to worsen in this region, including surrounding areas of Missouri and Oklahoma.

Glenn Petersen – retired

- Described noticing a big problem with tree decay as a result of mechanical injury on golf courses.

Jim Walla – North Dakota State University

A paper report was distributed, and the following summary was provided for insertion into the minutes:

- X-disease of chokecherry: Continuing research to identify and develop chokecherries tolerant to X-disease. Field plots of inoculated plants are being established. Inoculations have resulted in X-disease symptoms. Crosses to get chokecherry populations segregating for X-disease tolerance were successful.
- Ash yellows of ash: Clonal propagation is not working to obtain enough plants to inoculate to characterize ash yellows tolerance. Until propagation is successful, this project will not move forward. *It was noted during discussion that the importance of this research is currently questionable due to the threat of EAB.*

- Entomosporium leaf and berry spot of Juneberry: Fungicides were applied to identify possible treatments for Entomosporium. Nova (myclobutanil) followed by Captan provided the best reduction in disease.
- National Elm Trial: Two of the 16 plots were established in North Dakota. Replacements and additional cultivars will be outplanted in 2006 and 2007 (trees planted in Fargo were damaged by freezing and flooding in 2005).
- Question from John Ball: What effect might Ash Yellows have on Manchurian Ash? EAB does not affect Manchurian ash unless it is already stressed – could ash yellows be an initial stressor?
- Jim requests that as the states move forward with EAB to please let everyone know what is going on – both action *and* inaction.

Les Koch – Wyoming State Forestry Division

A paper report was distributed to the group. The following are highlights:

- Literature has stated that the banded elm bark beetle will also attack Russian olive in its native range. Observance has shown that outside the native range this is not the case.
- The White Satin Moth has been reported in one Wyoming county, though it is likely that the distribution covers most of the SW counties in the state. The native Eurasian moth has been in the US since the 1920's, gradually moving to the center of the continent. It is not currently listed as a noxious pest in WY, but has dangerous potential, as it is a member of the same family as Gypsy Moth. Caterpillars may be controlled through microbial insecticides containing *Bacillus thuringiensis* var. *kurstaki* (Btk), such as Foray 48B. Maximum activity is against early instar caterpillars.
- A preliminary EAB survey is being conducted in five locations, with one tree per site. Letters will be mailed to all municipalities and retail nurseries statewide, and they are looking into mailing information to Michigan hunters that travel to WY.

Michele Schoeneberger – USDA National Agroforestry Center

- The most requested publication is Diseases of Trees in the Great Plains, followed closely by Common Insect Pests of Trees in the Great Plains.
- Two new Threat Assessment Centers are now available in the East (North Carolina) and west (Oregon). Please make use of them to discuss concerns of the Great Plains area.

Mike Kangas – North Dakota State University

A paper report was distributed, including the following subjects:

- New tree pests – Cottony Ash Psyllid, Spruce Rust
- Common ND tree pests – Yellow-headed spruce sawfly, Oak Rough Bulletgall Wasp, Foliar diseases of deciduous trees (ash and oak anthracnose, Septoria leaf spot), and Diplodia Shoot Blight
- Non-native pests of concern:
 - Gypsy Moth – no positive catches in 2005

- EAB – Not yet present. Sentinel trap trees were placed in five communities, and visual inspections were performed at several parks and campgrounds throughout the state. Education and outreach efforts have begun and will continue, largely focused on firewood movement and nursery shipments from eastern states. Diversification of community forests is also being encouraged.
- GPTPC Listserve: All members of the listserv can send e-mails to the group at gptpc@ndsuent.nodak.edu
- To join the listserv, e-mail Mike at Michael.kangas@ndsu.edu Please include your name, position, address phone and FAX numbers, and e-mail address with your request.

Kelly Burns – USDA-FS, Lakewood

- Primary focus at the moment is White Pine Blister Rust, evaluating the efficacy of pruning techniques to preserve and increase longevity in limber & bristlecone pines. Long term monitoring plots will be established over the next three years in northern CO, WY and MT.
- Also testing for resistance against, and creating a management guide for WP blister rust.

Jeri Lyn Harris – USDA-FS, Regional Office

- Presented photos and details from the KS SOD survey, including photos of suspicious tar spots on red oaks. These cankers/tar spots were caused by a different type of *Phytophthora*, not *P. ramorum*.
- Current FHM risk map doesn't show much red on the Great Plains – mainly because it isn't recognized as forest area.
- FHM will be going under nationwide review soon.
- Jeri Lyn Harris was told at a recent meeting that the risk map will be used for funding allocations.

Jeff Witcosky – USDA-FS, Lakewood

- Many new publications and reports are available from the service center. Please contact him if you want copies.
- Subjects include: WP blister rust, banded elm bark beetle, mountain pine beetle, spruce beetle infestations.

John Ball – South Dakota State University

A paper report was distributed, and John mentioned that he posts a weekly report (every other week outside of the growing season) on his findings. Key topics mentioned included:

- Black ashes are declining across the state, no insect or pathogen has been associated with the decline but there is an unidentified bud miner found in many of these trees.
- Community tree inventories indicate that green ash is the most commonly planted tree, up to 45% in some areas.
- Planting efforts have declined, but new plantings are still ash.
- Hope to develop a threat risk for communities to help encourage diversity.
- Half of planting spots are vacant in most towns – good opportunity to increase diversity.
- Pinewood nematode is being identified as a serious problem in SD.
- Not finding EAB in Manchurian ash in China – finds it in imported green ash. Will look for more indications/troubles on a return trip to China.

Vicki Wohlers/Julie VanMeter – Nebraska Dept. of Ag

A paper report was distributed, including the following information and more:

- Gypsy moth trapping regime
- Japanese beetles – trapping and eradication efforts
- CAPS (Cooperative Agricultural Pest Survey) – Karnal bunt, Japanese beetle, Gypsy moth, Khapra beetle, nematode surveys, EAB, SOD
- SOD – NE Dept. of Ag is able to track all incoming material through nursery/grower supply database.

Bill Jacobi/Ronda Koski – Colorado State University

A paper report was distributed, and the following items discussed:

- An update on the national Elm trials
- Will perform an EAB survey with CAPS, and try to educate the public
- Fuel loading effects from dwarf mistletoe and mountain pine bark beetles
- Technology transfer of science research to users – becoming more difficult
- WP blister rust pruning study
- $MgCl_2$ use as a dust suppressant on gravel roads
 - Discussed impacts on roadside soil, vegetation, and stream concentrations of Chloride ions following long periods of $MgCl_2$ use.

Anastasia Becker – Missouri Dept. of Ag

- Working on trapping exotic and wood boring insects using Lindgren and canopy traps
- Only 7 banded elm bark beetles have been trapped – most are *multistriatus*.
- Trapping/observing many Granulate Ambrosia beetles (“red-wine” ambrosia beetles), thus adding it to the CAPS list of concerns. Has also been noted in KY, IN
- Conducting EAB visual survey, creating a firewood poster focusing on *all* pests that can come in with wood. She also noted that having several different kinds of posters may be more effective because if people see the message several times in different ways, they finally start to think about it.

- Gypsy moth trapping – 11,000 traps, 10 moths. None were caught in the St. Louis area this year.
- SOD survey of 50 nurseries and surrounding woods – all results came back negative.
- Itch mites also present in Missouri.

Emerald Ash Borer

Julie VanMeter began the discussion by distributing EAB information – pest alerts, current MI quarantine ZIP codes for use by campground monitors, EAB ID kits, etc.

Discussion of three draft letters prepared and distributed to the group by Jim Walla (Proposed recipients of letters: Great Plains State Foresters and Department of Agriculture Leaders as well as Ron DeHaven, Administrator of USDA APHIS).

- Need to stop not only vacationers bringing firewood, but also commercial distributors from using ‘cheap’ sources of wood from quarantined/questionable areas. Need to stress to all entities that using local sources is important.
- It may be difficult to institute any kind of regulation against bringing wood in from out of state, due to there already being a federal quarantine.
- We can’t let an outside organization/region dictate whether or not we can protect our ash resource – ash is a much more important component of Great Plains forests and communities compared to other regions across the country.
- Laurie Stepanek shared portions of a letter from Steve McCormick president and CEO of The Nature Conservancy calling for \$45 million in emergency funds to MI, IN, OH to control EAB – much of the initial funding granted to the Lakes States is no longer available.
- Bottom line is that we NEED SENATOR SUPPORT.
- Need to make EAB a priority with APHIS and Congress
- Region-wide action rather than state-by-state effort – if one of us gets EAB, we’re all at a much greater risk.
- Congress listens to NASF – we need to have them on board with the issue.
- Need to identify local sources of firewood to make it work? If we want people to buy their firewood locally, the resource needs to be present and usable.
- **Motion:** Send letters composed by Jim Walla to KS, NE, ND, SD, CO, WY, MT and IA (all states represented at 2006 GPTPC meeting). Seconded and passed.
- Jim Walla, Laurie Stepanek and Melissa Powers will work on revised versions of the letters, and send them to State Foresters, Dept. of Ag leaders and USDA APHIS.
- Additional discussion on EAB included questions about:
 - o Funding
 - o Methodology
 - o Comparison to nationwide SOD survey/response
 - All states voluntary, led by Steve Oak
 - o Penalties for violations?
- Potential state plans for EAB in 2007 (CAPS):
 - o KS – Exotic pest trapping – Glenn will continue with this.

- SD – Outreach and Education – pest & firewood alerts, appealing to the desire to maintain a resource, rather than prohibitory methods.
- Ned Tisserat joined on video conference and discussed the Great Plains Disease Network (Disease and Insect database & laboratory)

Tours

Tours of Horning Farm (a Nebraska Forest Service research area ravaged by pine wilt) and the Lied Jungle at the Henry Doorly Zoo in Omaha were offered on the afternoon of 4/26.

Further Commentary

- Bill Schaupp: thank you to all the people from different organizations for showing up and providing so much good information – great to have everyone here.
- Aug. 14-17 – National Plant Board Meeting in Milwaukee, WI – see <http://www.nationalplantboard.org/> for information
- Continued concern about the nationwide Risk Map – Great Plains always looks blank, regardless of the pest focus. We value the trees we have an incredible amount.
- Bring concerns about health risks and issues to your Forest Inventory & Analysis (FIA) author, especially for the 5-year issue-oriented reports. For an example, please see Indiana's report at: http://www.ncrs.fs.fed.us/pubs/rb/rb_nc253a.pdf
- See if we can come up with some numbers for the approximate dollar value of trees in the Plains States at risk, using urban tree surveys, FIA data, etc. People listen to dollar figures.
- Laurie Stepanek echoes Bill Schaupp in thanking all for attending.

Elections for 2007 Meeting

Chairperson: Melissa Powers
Secretary: Sheryl Costello

2007 Meeting Date and Location

The next meeting is tentatively scheduled for April 18-19, 2007. A location is yet to be determined, but will likely be Manhattan, KS.

Respectfully submitted, Melissa Powers, Secretary

Forest and Shade Tree Disease Studies-Spring 2007

Colorado State University

Bill Jacobi, Professor and Ronda Koski, Research Assoc.

Graduate Students: Betsy Goodrich, Jennifer Klutsch, and Russell Beam, Joel Eagan, Luc Tran
Department of Bioagricultural Sciences and Pest Management, Colorado State University, Fort Collins CO 80523
970-491-6927 FAX 970-491-3862 Laboratory Web Site <http://treehealth.agsci.colostate.edu/index.html>
william.jacobi@colostate.edu, ronda.koski@colostate.edu

Shade Tree Disease Studies:

1. **Tree and turf irrigation study:** A Horticulture PhD student is working on this project and is finishing this year. Ronda and I plan to write a summary paper on the project this year.
2. **Water usage by Cottonwoods:** We continue to take data on water potentials and tree health. Ronda and I will write a summary manuscript on this 10 year study.
3. **MgCl₂ study:** Salt used for dust control on gravel roads is common in the west. We find salt moves 0-20 feet away from gravel roads on normal embankments. Drainages pose a more complex issue and stream sampling indicates salt movement into streams. Trees take up chloride and concentrations are moderately correlated with foliar damage.
4. **Banded Elm Bark Beetle:** The Dutch elm disease pathogen was successfully isolated from the banded elm bark beetle and Plant Disease article is out. Inoculation/vector studies of 2006 indicated artificially infested beetles can move the fungus to feeding wounds. We have no infection/disease evidence yet but we will be repeating the study this summer.
5. **National Elm Trial:** We have 16 states with 17 sites total involved in a trial of 17-19 commercially available elm cultivars. NCR- 193 members and other cooperators are involved.
6. **CAPS:** We had an emerald ash borer survey using girdled ash trees in high-risk sites such as major nurseries and camping areas of Colorado. We plan to repeat the over an expanded area and do a firewood survey this year. Education efforts to reduce firewood movement into the state is making good progress but we need some all-out bans on interstate movement.

Forest Tree Insect/Disease Studies

1. **Armillaria Root Disease:** We plan to submit a manuscript on a survey of Armillaria in the Black Hills of SD.
2. **Black stain root disease on pinyon pine:** We are writing up a short paper on Pinyon in the Cortez CO area.
3. **White Pine Blister Rust:**
 - Holly Kearns developed a hazard-rating model for white pine blister rust on white pine populations in the Central Rocky Mountain Region and we have two paper submitted and we are currently working on two other papers.
 - We are continuing our small-scale meteorological analysis of the risk of blister rust in the Rocky Mts.
 - Coordination will continue of white pine health work via the Central Rocky Mountains White Pine Health Working Group.
 - Pruning of blister rust impacted trees: A demonstration study was installed at two locations- Sand Dunes and Medicine Bow NF in cooperation with USDA Forest Serve. Forest Health Management.
 - A cooperative project with the Rocky Mt Station and local districts provided cones from about 50 phenotypic resistant limber pine trees on the Medicine Bow and Roosevelt NF
4. **Trap and Lures for Ponderosa Pine Wood Borers:** Two manuscripts by Sheryl Costello on this work are in review.
5. **Technology Transfer of Forest Pathology:** Amanda Crump (MS candidate) finished her study on the movement of forest health science based information from researchers to the end users within the USDA, Forest Service. A manuscript is being prepared.
6. **Fire, Dwarf mistletoe and Mt Pine Beetles in Front Range Colorado Ponderosa Pine:** Jennifer Klutsch and Russell Beam (MS candidates) are finishing the study on interactions of these three disturbance agents. They are looking at fuel production, stand structure and fire and relationships between dwarf mistletoe and bark beetles.
7. **Thinning effects on bark beetle attack in California.** Joel Eagan has started a MS project comparing beetle mortality in unmanaged stands vs. stands thinned in the last 30 years.

Publications:

1. Jacobi, W. R., Koski, R. D., Harrington, T.C. and Witcosky, J. J. 2007. Association of Ophiostoma novo-ulmi with Scolytus schevyrewi Semenov (Scolytidae) in Colorado. Plant Disease: 91:245-247.
2. Kearns, H.S.J and Jacobi, W.R. 2007. The distribution and incidence of white pine blister rust in central and southeastern Wyoming and northern Colorado. Can. J. For. Res.: In Press
3. H.S.J. Kearns and W.R. Jacobi. 2005. Impacts of black stain root disease in recently formed mortality centers in the piñon-juniper woodlands of southwestern Colorado. Can. J. For. Res. 35:461-471.
4. H. S. J. Kearns, W. R. Jacobi and D. W. Johnson. 2005. Persistence of Pinyon Pine Snags and Logs in Southwestern Colorado. Western Journal of Applied Forestry, Accepted.

New Disease Issues: Pine wilt nematode was found killing a scotch pine in Greeley, Fort Collins, and Denver, CO. This is the first report of the nematode in Colorado. Walnut decline is a concern in several cities with bark beetles and Fusarium canker involvement.

Report to the Great Plains Tree Pest Council (2006 – 2007)

Meeting held in Manhattan, Kansas on April 18-19, 2007

Rapid City Service Center, Forest Health Management USDA Forest Service, Rocky Mountain Region (R-2)

Service Center Staff:	
Kurt Allen	Leader/Entomologist
Jim Blodgett	Plant Pathologist
Dan Long	Forest Health Technician
Bill Schaupp	Entomologist

Office:

8221 S Highway 16
Rapid City, SD 57702
Phone: (605) 343-1567
FAX: (605) 343-7134

Website: www.fs.fed.us/r2/fhm

Service Area: South Dakota, except the northwest corner; Nebraska; northern Wyoming east of the Continental Divide.

Service Responsibility: Support resource managers of federal and tribal lands on issues related to forest health, especially insects and diseases, by providing expertise, services and funding. We work primarily on lands administered by the U.S. Forest Service, Bureau of Land Management, National Park Service, and tribal lands including those administered by the Bureau of Indian Affairs. In addition, we provide services on state and private lands in cooperation with state forestry agencies.

New Office Location: We moved into a new building in Rapid City in October 2006. The facility also includes the Mystic Ranger District of the Black Hills National Forest and the Forest and Grassland Research Laboratory, a research unit of the Rocky Mountain Research Station.

Administration: We are now at 16 months without a full-time, permanent Group Leader for Forest Health Management. Acting in this capacity, each of our three Service Center Leaders has served several details in our Regional Office in Denver. It is expected that this vacancy will be filled soon. In addition, Erik Johnson, our aerial survey program manager, transferred to Alaska. Bill Schaupp will be covering his absence, with lots of help, until that vacancy is filled.

Recent Work

The Bark Beetles:

- Continuing epidemics of mountain pine, spruce, Douglas-fir, and western balsam bark beetles kept us busy in the mountains of Wyoming and South Dakota.
- *Ips* activity in jack and ponderosa pine continued to occur at elevated levels on the Nebraska National Forest in central Nebraska. Although at low levels, *Ips* activity in the Chadron area may increase as a result of recent large fires there.
- In and around the Black Hills, outbreak populations of *Ips* spp. appeared to be reduced for the second consecutive year, although some "hot spots" remain active.
- Two-lined chestnut borer, *Agrilus bilineatus* (Buprestidae), continued killing drought stressed bur oaks in south central and western South Dakota. On the Rosebud Indian Reservation, it killed a residual stand of bur oaks immediately following a thinning.

Other Insects:

- Defoliation by a pine sawfly, *Neodiprion autumnalis*, was evident on the Pine Ridge Indian Reservation and in the Nebraska panhandle, a phenomenon associated with persistent drought.
- Severe defoliation by tent caterpillars on the Crow Creek Sioux Indian Reservation, coupled with persistent drought and late spring frost, resulted in no fruit production on chokecherry for the 5th consecutive year. Some spraying is planned this year.
- Bur oak stands on several thousand acres of the northwestern portion of the Rosebud Indian Reservation were impacted by the basswood leaf miner, *Baliosus nervosus* (Chrysomelidae), which both mines and skeletonizes leaves, giving trees an orange appearance from a distance.
- We cooperated with USDA-APHIS, PPQ by deploying detection traps for gypsy moth in recreation sites of national forest and parks in South Dakota and Wyoming, all of which were negative. However, there were four moths collected in traps on the eastern edge of South Dakota and another four moths in a trap in the Black Hills area. No gypsy moths were detected in our zone in Wyoming.

Diseases and Insects:

- Completed a forest health survey to document major diseases, insects, and damage in 13 forest cover types in Wyoming. Three hundred systematically selected forested stands were visited.
- Described and modeled historic conditions in forest ecosystems as part of the Landfire project (www.landfire.gov/).
- Drought impacts were noted on most every site visit to the Great Plains in South Dakota.

Diseases:

- Started the third part of a study to examine the influence of forest fires on the abundance of *Armillaria ostoyae* in ponderosa pine stands. The main objectives were to 1) examine the effects of fire on the abundance and potential spread of *Armillaria* in ponderosa pine forests, and 2) test methods of quantifying and detecting the *Armillaria* pathogen.
- Completed the field component of a 3-year study of *Armillaria* distribution and species survey in Wyoming. One hundred and thirty three isolates were collected, and these are being identified to species. Four *Armillaria* species have been identified so far, with *A. ostoyae* being the most common, followed by *A. sinapina*, *A. gallica*, and *A. cepistipes*.
- Remeasured the white pine blister rust Pest Trend-Impact Plot System Survey (PTIPS) plots originally established in 1998 by J.L. Harris. These are a series of permanent plots to monitor pest trends, behavior, and impacts over time.
- Buffaloberry mortality investigation: 3 of 8 fungal isolates tested appeared to cause some symptoms. However, symptoms were only observed on 50%, 38%, and 25% of the inoculated branches; none of the mock inoculated branches had symptoms.
- Hazard tree assistance: Old Hill City Road Fire with Scott Roetzel, Assistant U.S. Attorney; campgrounds of the Bessey Ranger Districts of the Nebraska National Forest with Patricia Barney, Forest Supervisor/District Ranger; Rapid City with Rebecca Barnard, Urban Forester.
- Looked at sick ponderosa pine in western Nebraska with Laurie Stepanek and Doak Nickerson; causal agent not determined.
- Looked for white pine blister rust (WPBR) on limber pine at 4 sites in southwest Nebraska with Laurie Stepanek and Tandy Wheeler; WPBR not found.
- Monitor impact of hail events and consequent *Sphaeropsis (Diplodia)* and *Ips* activity.

Training Offered:

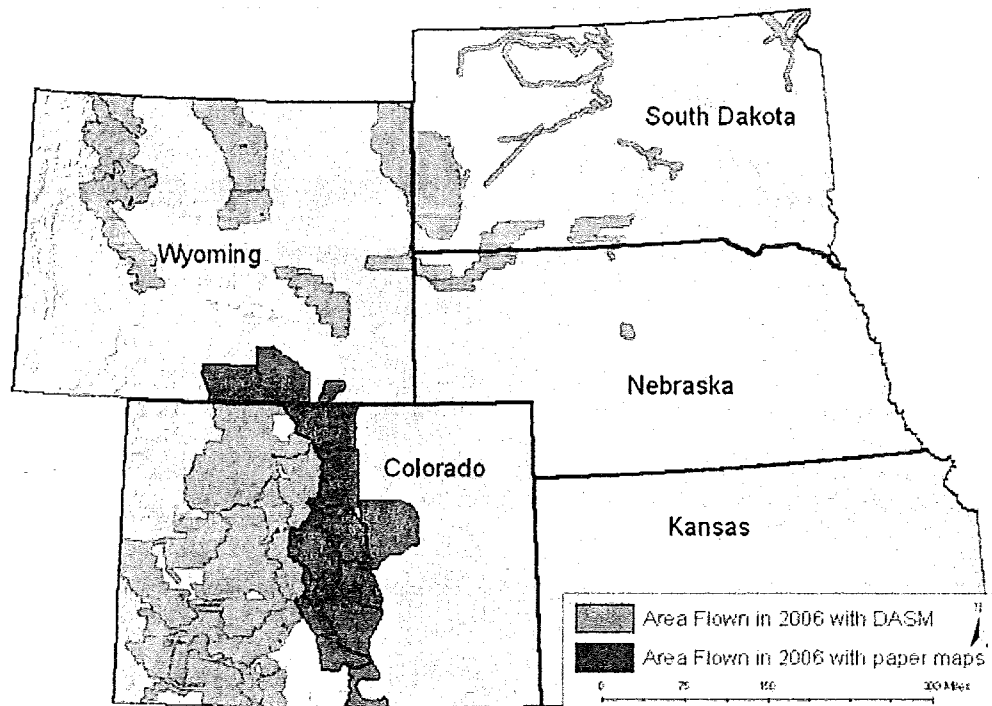
- Insect and Disease and Hazard Tree training in Rapid City in June, together with John Ball (SD RC&F) and Jeri Lyn Harris (R-2, FHM), to a wide spectrum of attendees.
- Participated in several youth educational events through SD Project Learning Tree, including Kids Fair, Walk-in-the-Forest, and presentations at Pine Ridge High School.

Aerial Survey:

Aerial overview detection surveys covered the Sisseton-Wahpeton, Standing Rock, Cheyenne River, Crow Creek, Lower Brule, Rosebud, Pine Ridge, and Wind River Indian Reservations; the Black Hills, Bighorn, Nebraska, and Shoshone National Forests; and associated state and private lands in all of these areas. Maps and digital data for aerial surveys are posted on the Internet at our website at www.fs.fed.us/r2/resources/fhm/aerialsurvey/.

On the Great Plains surveys, the most widespread impacts mapped were discolored foliage, dieback of branches and tree tops, and old and new mortality — all on hardwood trees. The surveyors continue to improve their skills with this complex task. Some ground checking was accomplished, although much more would be very beneficial.

Region 2 Aerial Detection Survey



Planned Work: 2007

Insects:

- Gypsy moth detection trapping in recreation sites of national forest and parks in South Dakota and Wyoming
- Bark beetle brood and line/transect sampling: spruce beetle, *Ips*, mountain pine beetle, Douglas-fir beetle, and western balsam bark beetle in the Black Hills, Bighorn, and Shoshone National Forests
- Interaction between fire-damaged ponderosa pine and insects
- Impacts of Douglas-fir beetle on forest conditions in the Bighorn National Forest
- Using MCH to prevent Douglas-fir and spruce beetle attacks
- Evaluating *Ips* infestations on the Bessey Ranger District, Nebraska National Forest
- Evaluate bur oak condition and 2-lined chestnut borer on the Rosebud Indian Reservation
- Evaluate pine sawfly defoliation on the Pine Ridge Indian Reservation
- Evaluate tent caterpillar impact and mass-trap *Ips grandicollis* on the Crow Creek Indian reservation

Diseases and Insects:

- Monitoring limber pine health in the central Rocky Mountains
- Assessing white bark pine regeneration in burned areas
- Forest health survey to document major diseases, insects, and damage in aspen and white birch stands in the Black Hills NF
- On-site disease and insect training on the Crow Creek Sioux Indian Reservation during the week of June 18

Diseases:

- Interaction between fire-damage and *Armillaria* in ponderosa pine forests of the Black Hills
- Continuing buffaloberry mortality investigation
- Examination of prior (2004) hail-*Sphaeropsis* (*Diplodia*) impacts on subsequent tree health
- Ozone monitoring/sampling in the Black Hills NF
- Hazard tree surveys

Aerial Detection Surveys:

- Black Hills and some or all of the Shoshone National Forest
- Plains and riparian forests in South Dakota and Nebraska, including the Nebraska National Forest and Wildcat Hills, the Pine Ridge, and Rosebud Indian Reservations

Recent Publications and Presentations

Service Trip Reports:

RCSC-12-06 - Site visit to the Crow Creek Sioux Reservation.

RCSC-13-06 - Aerial overview detection survey in 2006, Black Hills of South Dakota and Wyoming.

RCSC-01-07 - Bark beetle concerns in the Purdy Fire area.

RCSC-02-07 - Conditions of the North Fork campgrounds protected with MCH.

RCSC-03-07 - Mountain pine beetle conditions in the South Project area.

RCSC-04-07 - Mountain pine beetle conditions in the Upper Spring Creek area.

Biological Evaluations:

Allen, K. K., Dymerski, A. D., and D. M. Hardesty. 2006. Evaluation of mountain pine beetle activity in the Iron Mountain/Palmer Gulch area of the Black Hills National Forest. *USDA Forest Service, Rocky Mountain Region, Renewable Resources, Biological Evaluation r2-06-4*, 8 pg.

Allen, K. K., Dymerski, A. D., and D. M. Hardesty. 2006. Evaluation of bark beetle activity in the Bald Ridge area, Shoshone National Forest, Wyoming. *USDA Forest Service, Rocky Mountain Region, Renewable Resources, Biological Evaluation r2-06-5*, 10 pg.

Journal Articles:

Blodgett, J. T., Eyles, A., and Bonello, P. 2007. Organ-dependent induction of systemic resistance and systemic susceptibility in *Pinus nigra* inoculated with *Sphaeropsis sapinea* and *Diplodia scrobiculata*. *Tree Physiol.* 27:511-517.

Blodgett, J. T., Swart, W. J., Louw, S. vdM., and Weeks, W. J. 2007. Soil amendments and watering influence the incidence of endophytic fungi in *Amaranthus hybridus* in South Africa. *App. Soil Ecol.* 35:311-318.

Fettig, C. J., Allen, K. K., Borys, R. R., Christopherson, J., Dabney, C. P., Eager, T. J., Gibson, K. E., Hebertson, E. G., Long, D. L., Munson, A. S., Shea, P. J., Smith, S. L., and Haverty, M. I. 2006. Effectiveness of Bifenthrin (Onyx) and Carbaryl (Sevin SL) for Protecting Individual, High-Value Conifers from Bark Beetle Attack (Coleoptera: Curculionidae: Scolytinae) in the Western United States. *J. Econ. Entomol.* 99(5): 1691-1698.

Sieg, C. H., McMillin, J. D., Fowler, J. F., Allen, K. K., Negron, J. F., Wadleigh, L. L., Anhold, J. A., and Gibson, K. E. 2006. Best Predictors for Postfire Mortality of Ponderosa Pine Trees in the Intermountain West. *For. Sci.* 52(6): 718-728.

Abstracts and Proceedings:

Blodgett, J. T., and Lundquist, J. E. 2007. Distribution, species, and ecology of *Armillaria* fungi in Wyoming. Forest Health Monitoring Working Group Meeting Abstract.

Blodgett, J. T., and Lundquist, J. E. 2006. Distribution, species, and ecology of *Armillaria* fungi in Wyoming-Grand Teton NP. In Investigators' Annual Reports 2005. National Parks Service Rpt 33224 IAR-2005.

Blodgett, J. T., and Lundquist, J. E. 2006. Distribution, species, and ecology of *Armillaria* fungi in Wyoming-Yellowstone NP. In Investigators' Annual Reports 2005. National Parks Service Rpt 33226 YCR-IAR-2005.

Blodgett, J. T., and Lundquist, J. E. 2006. Wood blocks as *Armillaria* traps in burned ponderosa pine stands. *Phytopathology* 96:S13.

Blodgett, J. T., and Lundquist, J. E. 2006. Forest fire intensity affects the abundance of *Armillaria* root disease. Page 137 in: Guyon, J.C. comp. Proceedings of the 53rd Western International Forest Disease Work Conference. September 2005. Jackson, Wyoming. USDA Forest Service, Intermountain Region, Ogden, UT.

Howell, B., Burns, K. S., Blodgett, J. T., Guyon, J., and Jackson, M. 2007. Monitoring limber pine health in the Rocky Mountains. Forest Health Monitoring Working Group Meeting Abstract.

Presented Talks and Poster Presentations:

Wyoming white pine health studies. Central Rocky Mountains White Pine Health Working Group Meeting, Fort Collins, Colorado. March 2007.

Distribution, species, and ecology of *Armillaria* fungi in Wyoming. Forest Health Monitoring Working Group Meeting, San Diego, California. January-February 2007.

Monitoring limber pine health in the Rocky Mountains. Forest Health Monitoring Working Group Meeting, San Diego, California. January-February 2007.

Using wood blocks to trap *Armillaria ostoyae*. North Central Forest Pest Workshop, Pellston, Michigan. October 2006.

Wood blocks as *Armillaria* traps in burned ponderosa pine stands. American Phytopathological Society/ Canadian Phytopathological Society/ Mycological Society of America Joint Annual Meeting, Québec City, Québec, Canada. July-August 2006.

**Report to the Great Plains Tree Pest Council, Manhattan, KS
April 18-19, 2007**

**Lakewood Service Center, Forest Health Management
USDA Forest Service, Rocky Mountain Region (R-2)**

Lakewood Service Area: Northern Colorado, Kansas, and southern Wyoming

Function: We provide technical assistance on forest pest problems and forest health issues to federal land management agencies. We cooperate with state agencies to provide assistance on state and private lands.

Lakewood Service Center Staff:

Service Center Leader	Jeff Witcosky	jwitcosky@fs.fed.us	(303) 236-9541
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Aerial Survey Specialist	Vacant		(303) 236-8001
GIS Specialist	Jennifer Ross	jross@fs.fed.us	(719) 488-1242

Websites: R-2, Forest Health Management: www.fs.fed.us/r2/fhm
This site, created by Jim Worrall, Plant Pathologist at our Gunnison Service Center, includes a bulletin board, reports, staff listings, links, and much more.

National Office, Forest Health Protection: www.fs.fed.us/foresthealth
This site provides national program descriptions, forest insect and disease leaflets on line, publications, the national mortality risk map, and much more.

Staff Changes:

- Our FHM Group Leader and Aerial Survey Specialist positions are vacant currently.

Some Items of Significance for the Great Plains

(1) White Pine Blister Rust

Monitoring Limber Pine Health in the Central Rocky Mountains (Eval. Mon.). Long-term monitoring plots were established in northern CO/southern WY to assess the long-term ecological health of limber pine within WPBR-infested and threatened areas. The study will be extended to other parts of WY and central MT in 2007.

The management guide (*White Pine Blister Rust in the Rocky Mountain Region and Options for Management*) is near completion and will be available soon.

Pruning to Manage White Pine Blister Rust in the Central Rocky Mountains (CSU, NPS, USFS). We are evaluating the efficacy and feasibility of pruning to prolong the life of high-value bristlecone and limber pine in two recreational areas in CO and WY. We are currently working on getting a paper completed.

We are involved in two projects looking at genetic resistance (PI: Anna Schoettle, RMRS). 1). *Geographic Variation in Resistance to WPBR in Rocky Mountain Bristlecone Pine*. Seed was collected from throughout the range of bristlecone pine in Colorado and is being tested for resistance. Trees were inoculated in 2005 and will be assessed this summer. 2). *Guidelines for Limber Pine Restoration Projects*. The objective of this study is to develop and refine operational guidelines for cone collections and seed tree selections in areas that are not severely impacted.

The potential distribution (RISK) of WPBR for white pines in CO was modeled by Kearns (2005). A summary of the model and how it can be applied on a local level is available on the web (Howell et al. 2006): http://www.fs.fed.us/r2/fhm/reports/be_r2-06-04.pdf.

We (CSU/USFS) are coordinating Conservation Tree Selections in heavily impacted areas. In 2006, cones were collected from putatively resistant trees in the Pole Mountain area of the MBNF. In 2007, we will identify and monument conservation trees in the Bighorns (Blodgett) and on Laramie Peak, MBNF (Burns).

(2) Fire and Bark Beetles in Lodgepole Pine Stands

Sheryl Costello, Jose Negron (Rocky Mountain Research Station) and Rick Caissie (Arapaho-Roosevelt NF) were funded to conduct an Evaluation/Monitoring project entitled "Mountain Pine Beetle in Lodgepole Pine: Mortality and Fire Implications". Field work for the project will be done in 2006 and 2007, within the Sulphur Ranger District in north-central Colorado. The Fraser Valley is currently experiencing a severe mountain pine beetle outbreak. Purposes of this project include, documenting the extent and severity of tree mortality, and providing information on how mountain pine beetle outbreaks in lodgepole pine affect fire behavior, tree mortality, and crown fire potential over time. Data will be collected in mortality groups from 2000-present to examine forest conditions associated with tree mortality caused by mountain pine beetle. Additional data will be collected to model fire behavior, associated fire related tree mortality, and potential for crown fires.

(3) Scolytus schevyrewi – Banded Elm Bark Beetle

Bill Jacobi and Ronda Koski (Colorado State University) and Tom Harrington (Iowa State University) have published a paper to Plant Disease entitled "Association of Ophiostoma novo-ulmi with Scolytus schevyrewi, which has been published recently. Beetles were placed on a selective media and incubated. Isolates of O. novo-ulmi were obtained from 30%, 63% and 44% (CSU) and 8%, 84%, and 91% (ISU) of the beetles from the three elms. These results indicate that S. schevyrewi brood emerging from elm trees infected with Dutch elm disease can become infested with spores of this pathogen. To prove that S. schevyrewi is a vector of O. novo-ulmi, beetles would have to transmit the pathogen to healthy elms under laboratory conditions.

Jana Lee (post-doc, U.C. Davis), Steve Seybold (PSW), and Jose Negron (RMRS) continue to work on the biology of the banded elm bark beetle and are examining interactions between this bark beetle and the smaller European elm bark beetle, Scolytus multistriatus.

Recent Publications and Publications in Preparation

Jacobi, W.R., Koski, R.D., Harrington, T.C., and Witcosky, J.J. 2007. Association of Ophiostoma novo-ulmi with Scolytus schevyrewi in Colorado. Plant Disease 91: 245-247.

Lee, J.C., Negron, J.F., McElwey, S.J., Witcosky, J.J., and Seybold, S.J. 2006. Banded elm bark beetle – Scolytus schevyrewi. Pest Alert. USDA Forest Service, Rocky Mountain Region, R2-PR-01-06. 2 p.

Lee, J.C., Haack, R.A., Negron, J.F., Witcosky, J.J., and Seybold, S.J. In Preparation. Exotic Bark Beetles. Forest Insect and Disease Leaflet #176. USDA Forest Service. 12 p.

Recent Biological Evaluations

- Costello, S.L. and Howell, B.E.** 2007. Biological evaluation of mountain pine beetle and spruce beetle activity in the Larson II Analysis Area on the Hahns Peak/Bears Ears Ranger District, Medicine Bow – Routt National Forests and Thunder basin National Grassland, 2006. USDA Forest Service, Rocky Mountain Region, Biological Evaluation R2-07-01. 49 p.
- Costello, S.L. and Howell, B.E.** 2007. Biological evaluation of mountain pine beetle in the Keystone Ski Area of the Dillon Ranger District, White River National Forest, 2007. USDA Forest Service, Rocky Mountain Region, Biological Evaluation R2-07-02. 35 p.
- Costello, S.L. and Howell, B.E.** 2007. Biological evaluation of mountain pine beetle activity in the Blue Ridge Analysis Area on the Sulphur Ranger District, Arapaho and Roosevelt National Forests and Pawnee National Grassland, 2007. USDA Forest Service, Rocky Mountain Region, Biological Evaluation R2-07-03. 33 p.
- Howell, B., Kearns, H.S.J. and Burns, K.S.** 2006. Biological evaluation of a model for predicting presence of white pine blister rust in Colorado based on climatic variables and susceptible white pine species distribution. USDA Forest Service, Rocky Mountain Region, Biological Evaluation R2-06-04. 15 p.
- Kearns, H.S.J. and Burns, K.S.** 2005. Distribution, incidence and severity of white pine blister rust on the Medicine Bow National Forest. USDA Forest Service, Rocky Mountain Region, Biological Evaluation R2-06-01. 18 p.

Recent Service Trip Reports

- LSC-07-01** Evaluation of engraver beetle and twig beetle outbreak at Fort Carson Army Base.
- LSC-07-02** Evaluation of bark beetle and dwarf mistletoe treatment areas on the Air Force Academy.
- LSC-07-03** Evaluation of mountain pine beetle outbreak in Rocky Mountain National Park.
- LSC-07-04** Status of mountain pine beetle populations in the Devils Gate Analysis Area on the Laramie Ranger District.
- LSC-06-05** Evaluation of bark beetles in campgrounds near the Cache La Poudre River in northwest Colorado.

Report to the Great Plains Tree Pest Council

April 18-19, 2007

Manhattan, Kansas

Mark Harrell and Laurie Stepanek
Nebraska Forest Service, University of Nebraska

Pine wilt

Scotch pines in large numbers were killed again by pine wilt in 2006. About 6,000 pines have been killed by the disease since it entered the state about nine years ago. The southeastern corner of the state, generally south and east of Lincoln, is the area where mortality is the greatest. The disease seems to be spreading more quickly to the west than the north. The spread northward might be slowed by the cooler climate. Trees as far west as near McCook and as far north as near Norfolk died from pine wilt last year.

A test of a nematicide treatment for pine wilt that was completed in 2005 led to the first commercial treatment for the disease in the U.S. in 2006. Greyhound (abamectin) trunk injection treatment is fairly expensive, so it is used only on high value trees, and it was used on just over 100 trees in Nebraska last year.

In 2007 a three-year test of emamectin benzoate will be started in a Scotch pine planting north of Lincoln. Emamectin benzoate is believed to be more effective than abamectin against the pinewood nematode, so it is likely to work better than the 70% protection abamectin gives, require a lower dose, and be able to protect trees at a lower cost.

Emerald ash borer

In 2006 the Nebraska Forest Service helped organize the Nebraska EAB Working Group to address issues surrounding EAB, including:

- identification of substitute species for ash in landscape and conservation plantings
- preemptive removal of ash trees to distribute removal costs over several years
- management of out-of-state firewood
- effective, feasible early detection methods
- actions following EAB detection in Nebraska
- effective treatment options
- handling large amounts of dead and infested trees and associated wood waste.

The group includes representatives from federal, state, and local governments and green industry professionals, and meets monthly to keep its members up-to-date on EAB research and activities.

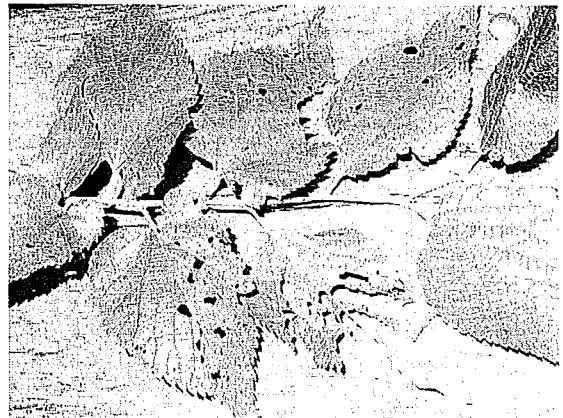
USDA APHIS PPQ (Vicki Wohlers, Timothy Miller)
USDA Forest Service (Bill Schaupp)

USDA Natural Resources Conservation Service (Constance Miller)
Nebraska Forest Service (Mark Harrell, Eric Berg, Laurie Stepanek)
Nebraska Department of Agriculture (Julie Van Meter)
University of Nebraska Department of Entomology (Jim Kalish)
University of Nebraska Department of Agronomy and Horticulture (Kim Todd)
Nebraska Statewide Arboretum (Justin Evertson)
Nebraska Game & Parks Association (Mike Groenewold)
Nebraska Association of Resources Districts (Justin Apel)
Nebraska Arborists Association (Robert Smith)
Nebraska Nursery and Landscape Association (Todd Faller, Jim Kluck)
Lincoln Parks and Recreation (Steve Schwab)

A trap-log survey using fresh-cut ash logs coated with tanglefoot was conducted in five state parks in 2006. No emerald ash borers were found. Plans for this year include using purple sticky traps baited with attractants and placed near ash in state parks.

Leaf Tatters

Hackberry trees in scattered locations of eastern Nebraska displayed symptoms of leaf tatter (leaves with missing interveinal tissue). Many affected trees also showed symptoms of decline. In the past, leaf tatters was attributed to freeze injury to leaves in the bud; however recent research (Samtani, et al, 2005) has shown that chloroacetamide herbicides used in corn (Harness Xtra, Dual Magnum) can cause leaf tatter symptoms in white oak. Observations in Iowa show extensive oak tatters in years when corn is planted in nearby fields.



Samtani, J.B., J.B. Masiunas, & J.E. Appleby (2005). Abnormal leaf development on white oaks linked to drift of chloroacetamide herbicides. Online. Plant Health Progress doi:10.1094/PHP-2005-0221-01-HN.

Pest conditions

Pine wilt: Continues to kill many Scotch pines and some Austrian pines annually in southeastern Nebraska. It also appears to be killing large numbers of jack pine at Horning Tree Farm near Plattsmouth --an area where disease pressure is high.

Oak decline: Bur oaks in eastern and north-central Nebraska over the past several years have shown symptoms that have often looked like oak wilt. The symptoms include foliage that dies completely or has large necrotic areas, branch dieback, general decline in the tree, and occasionally some streaking in the wood. It appears the trees are declining from changes in site conditions from human activities combined with oak wilt along the eastern edge of the state and grazing in the north-central area.

White pine decline: White pines at a number of locations in southeastern Nebraska have died suddenly in recent years without any clear indication of the cause. Possibly poor soil conditions for white pine in combination with root diseases are responsible.

Pine tussock moth: An outbreak of pine tussock moth in native ponderosa pine occurred in the Wildcat Hills southeast of Scottsbluff in 2006. The outbreak will be monitored in 2007. Heavy defoliation from pine tussock moth had occurred in a nearby area in 2003-2004.

Pine sawfly: Caused significant defoliation in ponderosa pine in an area of the Wildcat Hills south of Scottsbluff.

Cercospora blight of juniper: Continues to severely defoliate and kill junipers and redcedars in windbreaks in central and eastern Nebraska.

Diplodia (Sphaeropsis) blight: Continues to be a serious problem on Austrian and ponderosa pines in windbreaks and landscape plantings in eastern Nebraska.

Bagworm: Populations continue to be high on eastern redcedar in some areas in eastern Nebraska and are causing some tree mortality.

Dioryctria pine moths: *Dioryctria ponderosae* and *D. tumicolella* in central and western Nebraska and *D. zimmermani* in eastern Nebraska continue to damage and kill trees.

Ice and Snow Ice storms in December 2006 and January 2007 caused limb breakage to trees in central Nebraska.

New publications

Harrell, M., R. Allison, and L. Stepanek. 2007. Abiotic problems of trees. Nebr. For. Serv., FH07-07, 2 pp.

Harrell, M., R. Allison, and L. Stepanek. 2007. Diseases of evergreen trees. Nebr. For. Serv., FH03-07, 2 pp.

Harrell, M., R. Allison, and L. Stepanek. 2007. Insect pests of broadleaf trees. Nebr. For. Serv., FH06-07, 2 pp.

Harrell, M., R. Allison, and L. Stepanek. 2007. Insect pests of evergreen trees. Nebr. For. Serv., FH04-07, 2 pp.

Harrell, M., J. Chaky, R. Allison, and L. Stepanek. 2007. Diseases of broadleaf trees. Nebr. For. Serv., FH05-07, 2 pp.

Stepanek, L. 2006. Wanted: dead or alive—emerald ash borer. Nebr. For. Serv., FH01-06, 2 pp.

Stepanek, L. 2006. Pine wilt—a fatal disease of Scotch pine. Nebr. For. Serv., FH02-06, 2 pp.

**North Dakota - Woody Plant Disease Research - Jim Walla, NDSU Plant Pathology
Report for Great Plains Tree Pest Council meeting, Manhattan, KS, April 18-19, 2007**

I - Chokecherry X-disease (Primary current research) (cooperators: Dai, NDSU, Knudson, USDA PMC):

X-disease is the most limiting problem of chokecherry in the north-central U.S., and has the potential to damage this and other stone fruits anywhere in North America. Most chokecherry plants become infected and are killed or severely damaged by age 20, compared to an expected life of 70+ years. No economical controls are available. In North Dakota, where chokecherry was designated the State Fruit in 2007, the disease severely damages chokecherry in plantings and native stands, and awareness of the problem limits its use in new plantings. Chokecherry plants that appear to be highly tolerant to X-disease have been identified, and research is being done to evaluate and develop those plants. Success would lead to chokecherry being the most important resource conservation shrub in the region, resulting in reduced soil erosion, improved water quality, greater wildlife benefits, and increased crop and livestock profits. In addition, it would remove the major obstacle for development of chokecherry orchards as a specialty crop, as has become popular in adjacent Canada.

Putatively resistant chokecherry plants have been identified and we are in the process of evaluating X-disease resistance of tissue-culture propagated clones of the original plants. Tissue culture is slow and tedious, but it appears that the process eliminates phytoplasmas from the plant material. Intentions were to evaluate resistance using two X-disease phytoplasma isolates in 2 field trials and 1 greenhouse trial. One field trial has been in the process of being established for four years. Numerous problems finally led to the decision this spring to do the greenhouse trial first and then field trials with whatever clones appear to have useful resistance.

II - Ash yellows of green ash (cooperators include Dai):

As of 2006, ash was the most planted tree species for resource conservation and landscapes in North Dakota, and is very important elsewhere in North America, as well. If emerald ash borer can be stopped, ash yellows will return to being the most serious threat to ash. Characterization of tolerance to ash yellows in ash cultivars would allow urban foresters to use cultivars that is most likely to succeed. Identification of tolerance to ash yellows in rootstocks would allow some less-tolerant ash cultivars to be utilized. Identification of ash yellows tolerant trees would allow seed orchards to be established for production of tolerant seedlings for resource conservation plantings. If the EAB threat is reduced, own-rooted materials of ash cultivars will be inoculated and evaluated for tolerance to ash yellows. Ash cultivars would be evaluated in field trials for ash yellows tolerance using standard rootstocks and pathogen isolates. This is all on hold at this time (see EAB opinion-editorial <http://www.ag.ndsu.edu/trees/whatnew/Tree_Talk_June2006-2.pdf>).

III - Juneberry (*Amelanchier alnifolia*) research

A - Entomosporium leaf and berry spot of juneberry - Fungicide trials (cooperator Hatterman-Valenti):

Juneberry is a high-value crop species that is currently the top commercial fruit in Saskatchewan, Canada, and it has potential to be the same in North Dakota and adjacent states. Entomosporium leaf and berry spot management is required for sustainable development of a juneberry industry. Pesticides are available to manage the problem in Canada, but registration and known effectiveness of fungicides available in North Dakota lag behind. Results of our Entomosporium leaf and berry spot research will provide growers with information they can use to manage the disease. The results will also be used to pursue registration of those fungicides that performed well but are not

labeled for use on juneberry.

Five treatments (1: Abound (Azoxystrobin 22.9%) alternated with Kumulus DF (sulfur 80%); 2: Kumulus DF; 3: Nova 40W (Myclobutanil 40%); 4: Captan 50WP (captan 48.9%); 5: water control) were **evaluated in 2005**. Six treatments (1: Abound alternated with Nova 40W; 2: Switch 62.5WG - (Cyprodinil 37.5%, Fludioxonil 25%) alternated with Nova 40W; 3: Nova 40W; 4: Captan 50WP; 5: water control; 6: PropiMax EC (propiconazole 41.8%) were **evaluated in 2006**. Of these, only Abound and Kumulus DF were registered for use on juneberries in the US in 2005, and none have been evaluated in the US for efficacy of disease control on juneberries. Registration for Kumulus DF expired by 2006. In 2006, Abound and Switch were registered for use on juneberries in the US, and Nova was registered for use on berry plants, but juneberry was not specifically listed on the label. Replicated plots were established at the same three locations in both years. In 2005, the Bismarck, ND location had very high disease pressure, the Fertile, MN location had moderate disease pressure, and the Absaraka, ND location had low disease pressure. Until very late in the 2006 season, there was much lower disease pressure at all sites than in 2005, but was highest at Fertile, a little lower at Absaraka, and lowest at Bismarck. Each treatment was applied at two week intervals, from late May to early July in 2005 and from early May to early August in 2006. Disease ratings were made at two-week intervals from early June through early August in 2005 and from early June through early September in 2006. Leaf spot data were analyzed by ANOVA. Berry spot data had many missing values, and a technique to analyze them is still to be found.

Across sites and ratings times in 2005, when disease pressure was more severe, particularly as the season progressed, Nova provided the best disease control, Abound/Kumulus and Captan provided intermediate control, and Kumulus provided unacceptable control. In 2006, when disease pressure was relatively low, the Abound/Nova, Switch/Nova, Nova, and PropiMax resulted in a similar level of leafspotting in most instances, particularly as the season progressed. The same was true with Captan at two of the three sites. Statistically, PropiMax, Abound/Nova, Nova, and Switch/Nova provided the best control after late July and Captan provided intermediate control compared to the water control.

New project in 2006:

B - Selection of superior juneberry plants to evaluate for commercial release (cooperative with Hatterman-Valenti and Zeleznik, NDSU Plant Sciences Dept.).

We will be searching for superior plants in 2007 and 2008. We hope to get public participation in this search. Selected plants will be clonally propagated and placed into field trial sites to evaluate each clone for potential commercial release. The trait most important for commercial release is large berry size. Below that is quantity and consistency of berry production. The remaining important traits include berry flavor, plant shape, size, and density, and **insect and disease resistance**. I guess that shows where we rate.

IV - National elm trial (a national project led by W. Jacobi, Colorado State Univ.)

American elm was one of the most dominant tree species in North Dakota and much of North America before it was devastated by the introduction and spread of Dutch elm disease. Its loss had serious impacts on landscape plantings, resource conservation plantings, and native woodland ecosystems. Over many subsequent years, American elms and hybrids of introduced elm species were selected or developed for Dutch elm disease resistance. Some of the early introductions proved to have other problems that made them unacceptable for replacement of American elm, and that led to distrust of later releases. As more and more insect and disease problems affect our urban forests, emphasis needs to be placed on increasing or at least maintaining species diversity so that environmental, economic, and aesthetic impacts of individual problems will be reduced. Elms should be included in

our urban forests. This study will evaluate the performance of many of the currently-available Dutch elm disease-resistant elm cultivars in settings across the United States. The cultivars will be exposed to local insect and disease problems, and to the wide range of environmental stresses that occur in different areas. Those elm cultivars that are resistant or hardy to the various pests and other stresses will be identified. Distribution and demonstration of the resulting information to urban foresters, tree nurseries, landscape planners, and the public will result in renewed acceptance of elms and in greater species diversity in our urban forests.

There are two trial sites in ND, one in Fargo and one in Bismarck. Wide extremes of severe weather have hit the ND sites in 2005 and 2006, from extreme drought to 112 F temperature to late freezes to prolonged flooding. We will see what 2007 brings.

In Bismarck, 12 new and replacement trees were planted in 2006, 9 of which died during the 2006 season. Another 18 trees died after the fall of 2005, making a net loss of 15 trees from fall 2005 to fall 2006. In Fargo, 33 new and replacement elms were planted in 2006, 10 of which died during the 2006 season. Another 10 trees died after the fall of 2005, making a net gain of 13 trees from fall 2005 to fall 2006. Some of the losses were due to unadapted cultivars. Most of the loss of new trees was due to severe drought and heat during the 2006 season.

Ten trees (2 cultivars) will be planted in 2007.

V - Stigmina needlecast (?) of spruce (cooperatively with Kinzer, NDSU Diagnostic Lab)

The NDSU Plant Diagnostic Laboratory received a spruce sample in 2006 on which *Stigmina lautii* was tentatively identified. *S. lautii* was not previously known in ND. Subsequently, I searched for pertinent literature and contacted forest pathologists in other states and countries to summarize available information. This search indicated that very little is known about *S. lautii*, with the only available information involving incidence, mycological traits, and cursory damage descriptions. It had been found in NC, VA, and NY in the USA and in BC, MB, and SK in Canada. No information regarding pathogenicity, life cycle, or management is available. I subsequently participated in collections and made observations in ND to evaluate incidence, severity, symptoms, biology, and possible management of the fungus. See

<http://www.ag.ndsu.edu/trees/whatnew/Tree_Talk_Dec2006-2.pdf> for summary information.

Stigmina lautii was found apparently causing spruce needlecast in ND in 2006. All spruce samples with needlecast that were examined in 2006 in ND were infected with *S. lautii*, while *Rhizosphaera kalkhoffii*, the usual spruce needlecast pathogen in ND, was not found. Deductive and observational investigations indicated that 2006 was the first year that substantial *Stigmina* needlecast occurred in ND at some sites. Presence in 8 counties in eastern and central ND indicate that *S. lautii* is likely present throughout that part of the state. Hosts in ND were *Picea pungens* and *P. glauca*. The highest incidence and severity of *Stigmina* needlecast occurred in the lower crown and on the north side of trees. The level of disease severity justified concern in conservation plantings and immediate management in ornamental landscape settings. Signs and symptoms of *Stigmina* needlecast were similar to those caused by *Rhizosphaera kalkhoffii*. By late summer, fruiting bodies of *S. lautii* were present on some asymptomatic as well as necrotic second-year and older needles. Symptoms on needles ranged from discolored bands to complete necrosis. The color of necrotic tissues ranged from a general off-green to yellow, tan, brown, reddish-brown, red, or purple. Apparent differences between *Stigmina* and *Rhizosphaera* needlecasts included reduced tree to tree variation in age-class of infected needles for *Stigmina* than is typically observed with *Rhizosphaera*. It also appeared that there were fewer fruiting bodies with *Stigmina*. Presence of *S. lautii* fruiting bodies by July on second-year needles indicated it infects first-year needles and can sporulate within 13 months after infection. Observations at one site that received treatments for *Lirula* needle blight, but where *S. lautii* was also

subsequently confirmed, indicated that applications of chlorothalonil soon after new shoot growth and one month later for three years prevented most infections by *S. lautii* and effectively eliminated damage by *S. lautii*.

S. lautii could be a plant pathogen, an endophyte that normally grows in needles without causing damage unless the tree is under unusual stress, or a parasite on other fungi (mycoparasite). Other *Stigmina* species are reported to be plant pathogens. If it is an endophyte that fruits only when the needles are stressed or senescing, then there must be a stress that is now widespread in North Dakota and other parts of the United States. If it is a parasite on other fungi, the only likely host would be *Rhizosphaera*. The strong similarity in occurrence of fruiting bodies and in apparent symptoms fits this scenario. Not finding *Rhizosphaera* on multiple random samples indicates that *S. lautii* would either be a widespread pathogen, an unusually efficient mycoparasite, or so competitive that it "out-competed" *Rhizosphaera* for all infection sites. Observations in late September of a row of about 100 large Colorado blue spruce indicates *S. lautii* is a pathogen. *Stigmina* fruiting bodies were present on at least some second-year needles of every tree observed. This would be very unusual for *Rhizosphaera*, where considerable tree-to-tree variation in fruiting and disease severity is normal. The different patterns of appearance make it unlikely that *S. lautii* is a mycoparasite of *R. kalkhoffii*. The likely alternative is that *S. lautii* is a spruce pathogen.

Spruce trees are one of the most valued ornamental plants in the north central United States, and owners typically go to great trouble and expense to care for them. The discovery of *Stigmina* needlecast on spruce in ND will result in much indecision in dealing with diseased spruce compared to when only *Rhizosphaera kalkhoffii* was known to cause spruce needlecast. Submission of samples to a diagnostic laboratory will now be required to diagnose the pathogen. If that diagnosis is *Stigmina lautii*, no management practices can be recommended. Thus, millions of dollars worth of spruce in ornamental plantings and millions of dollars worth of resources protected by spruce in resource conservation plantings will be at risk of serious damage with no option for protection. This discovery of substantial damage by *Stigmina* needlecast in ND will result in proposed research to understand the biology of the fungus and, if found appropriate, development of management options for the disease, thus potentially redirecting NDSU research efforts.

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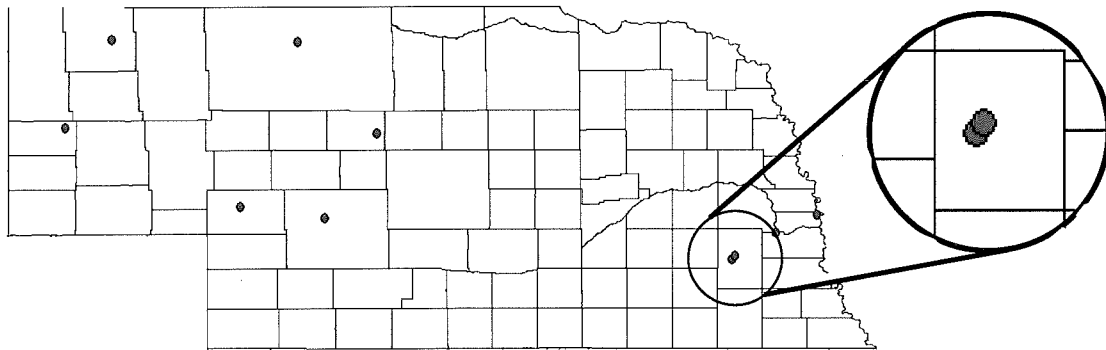
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2006 Nebraska Bark Beetle/Sirex noctilio Survey Program - Interim Program Summary
 Prepared by Tim Miller, Plant Health Safeguarding Specialist, USDA-APHIS-PPQ

The 2006 Nebraska bark beetle/Sirex trapping program was conducted by USDA-APHIS-PPQ personnel at 10 trap sites spread across the state in a total of 8 counties. Each site was equipped with two 12-funnel, wet cup Lindgren funnel traps supported by metal trap stands and baited with either Siricid lure (70% α -pinene : 30% β -pinene) or a combination of an ethanol lure + an α -pinene lure. An exception was made at the Fontenelle Forest location in Sarpy County where the Siricid lure was replaced with an ethanol lure due to the lack of coniferous hosts in the area. Trap sites were as follows:

<u>Site</u>	<u>County</u>
Lake Minatare State Recreation Area	Scotts Bluff
Chadron State Park	Dawes
Samuel R. McKelvie National Forest	Cherry
Nebraska National Forest	Thomas
Lake McConaughy State Recreation Area	Keith
Bailey Rail Yard	Lincoln
Pioneers Park	Lancaster
Lincoln Rail Yard (vicinity of)	Lancaster
Strategic Air Command Museum	Sarpy
Fontenelle Forest	Sarpy



2006 Nebraska bark beetle/Sirex trap sites

Traps were in the field from May 8 – Sept. 25 representing a total of 2,526 trap days. Samples were collected at roughly 2-week intervals for a total of 169 samples.

A portion of the bark beetle samples are still being processed prior to shipping for identification. Specimens identified to date are all native North American or established foreign species representing the potential for 2 state records from the genera *Hylastes* and *Xleborus*, and at least 3 county records for *Scolytus schevyrewi* Semenov.

A total of 15 Siricid specimens were taken. Specimens identified to date are *Tremex columba* (Linnaeus) and *Sirex edwardsii* Brullé. *S. edwardsii* may be a new state record. Additional specimens awaiting identification include what appear to be *Xeris* sp., *Sirex* sp., and an *Urocerus* sp. The remaining unidentified apparent *Sirex* sp. specimen does not have the diagnostic leg color of *S. noctilio*.



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