United States Department of Agriculture | Forest Service | R-4

Reply to: 3400 **Date:** November 14, 1991

Subject: Recommendations of the Bark Beetle Steering Committee - FY92

To: James C. Space
Director, FPM

The Bark Beetle Steering Committee met in Portland, Oregon, on October 1-2, 1991. The committee includes all aspects of technology development for western bark beetles and southern pine beetle. Enclosed are the notes from the Portland meeting which include a description of the 1991 project results and the proposed 1992 projects. The projects proposed for funding in 1992 are prioritized by bark beetle. The overall top ten projects for the western bark beetles are listed, as are the top three projects for the southern pine beetle.

/s/ David G. Holland

DAVID G. HOLLAND
Chairperson
Bark Beetle Steering Committee

Enclosures (2)

cc:
M. Weiss
L. Ferguson
BB Mailing List

(Enclosure 1)

BARK BEETLE STEERING COMMITTEE
PORTLAND, OREGON
OCTOBER 1-2, 1991

Attendees:

Dave Holland	Dave Bridgwater
Gene Amman	Ken Swain
Ladd Livingston	Dayle Bennett
Ken Gibson	Garland Mason
Ralph Thier	Steve Munson
Laura Merrill	Wayne Berisford
Ron Billings	Ken Lister
Gene Lessard	Jane Hayes
Skeeter Werner	Bob Bridges
Ed Holsten	Pat Shea
Dave Schultz	Lonne Sower
Wes Nettleton	Jed Dewey
Tom Hofacker	Darrell Ross
Gary Daterman	Iral Ragenovich

The Bark Beetle Steering Committee met in Portland, Oregon, on October 1-2, 1991 at the Benson Hotel. The new committee, formerly the Western Bark Beetle Workgroup, has expanded in size and role to included all aspects of technology development for western bark beetles and southern pine beetle. Dave Holland will chair the committee and submit a prioritized list of projects to the National Technology Development Task Force. Marianne Morabito, Boise Field Office - Region 4, will serve as the Program Coordinator for the committee with responsibility for managing the tracking of accomplishments, funding allocations, submission of projects, and maintaining records. Any information needs can be requested through Marianne. Copies of all project proposals and accomplishment reports should be sent to Marianne.

The committee's expanded role will provide a forum for broad transfer of research and development information among scientists in the west and southeast. However, to maintain the integrity of small, efficient working groups, the southern pine beetle workgroup and the western bark beetle workgroup will meet independently to discuss priorities for their respective areas. At each committee meeting, time will be managed to provide for these workgroup meetings as well as joint meeting time as a committee. Priority listing of projects for technology development funding will involve independent listings for each workgroup.

Dave Holland and Bob Bridges provided information on the status of the western Bark Beetle RD&A. Funding for FY 1992 is an "add-on" consisting of $1,000,000 for FIDR in new dollars and $500,000 for FPM earmarked from existing federal suppression dollars. The funding in FPM will be managed through the FPM Technology Development Program. The "formal" RD&A proposal is being submitted at the upcoming congressional budget hearings (it was not included in the budget submission from the Department) for a 5-year RD&A program funded at 5.7 million dollars per year. The RD&A will require a 1-year Plan for FY 1992 and a 5-year Plan for the full program to be implemented in FY1993.

To meet the administrative and technical needs of the RD&A, the following "organization" was agreed to during this meeting. A Core Team composed of Bridges (FIDR-WO), Hofacker (FPM-WO), Holland (FPM-R4), Mason (PSW), Shea (PSW), Daterman (PNW), and Amman (INT) will provide administrative guidance for the RD&A. Technical guidance and planning will be by the Bark Beetle Steering Committee. The 5-year Plan for the RD&A will be developed by the Steering Committee as part of their present effort in developing 3- to 5-year plans for semiochemical technology. Plan format will be a "convergent analysis" approach depicting scheduling, products, responsible scientists, and dollars. Guidelines for Plan development will be sent to Beetle Team Leaders by Dave Holland. Draft plans will be due by February 14, 1992. A final 5-year plan for the RD&A will be submitted by June 1, 1992.

Tom Hofacker discussed a "white paper" being prepared toward an exemption for Lepidoptera pheromones, which could take two more years. In the very near future, we could have the acre limitation extended to 500 acres before requiring an Environmental Use Permit.

Tom provided a brief update on registration status for MCH and Verbenone. MCH has all the toxicology tests done and Jesus Cota has copies of 6 0f the 8 tests. John Kennedy is requesting an amendment to the MCH EUP to cover this year's planned work. Nothing is happening with PheroTech's Verbenone registration application.

Committee feels a strategy to accelerate "registration status" needs to be developed by Core Team.

1991 FIELD RESULTS BY BEETLE

MOUNTAIN PINE BEETLE:

R-2 Mountain pine beetle in ponderosa pine, Medicine Bow NF, Uncompadre NF. Spray & bait Treatment. 90 trees treated with Sevin. 2 trees baited per plot. Protected all sprayed trees. Overflow on all plots. On untreated plots, only 2 trees were not attacked. Want to test grid pattern next year to demonstrate area effect. Tested Sevin flowable. How do we demonstrate area effect of pheromone treatment? (Need sampling design)

INT: Mountain pine beetle - verbenone. 2-1/2 acre blocks using 10, 20, 40, and 68 caps per acre. 1988 results: 20 caps per acre; 1989 results: 40 caps per acre; 1990 and 1991 no detectable difference. Two-thirds of verbenone eluted in 45 days. Quality of caps, membrane consistency, standardize elution rates, geograhpic variation, etc. are the basic questions needing to be answered. Reports published.

IPS spp.

R-1: Ips - Ken Gibson - Pine engraver, Custer NF, Coop with John Borden. Verbenone and Ipsenol (separate beads) were tested to prevent infestion of thinning slash. Had 2 feet of snow after putting out dispensers. Not much difference between treated and untreated. Phero Tech beads: Verbenone - .85g/m^2, Ipsenol - .05g/m^2. Need to do again. .50m^2 blocks treated. Early treatment effects: beads did not hold long enough.

Funnel traps baited with Ipsdienol were used in "trap-out" technique to keep Ips out of slash.
- 4 to 6 traps around slash piles at 20' to 25' intervals on 18 piles.
- 50 m grid on 3 acre area with broadcast slash. No difference between treated and untreated.

Lanieronone is a new attractant for Ips. Lanieronone vs. Ipsdienol with unbaited traps as checks. Lanieronone plus Ipsdienol appears to attract more beetles.

R-4: Ips pini - Compliment to R-1 study (Report enclosed).
No significant difference in block attributes. Significant treatment effect.
5 treated blocks, 55 percent infested (frequency of attack), 11.51 attacks/m^2 (density of attack).
5 untreated blocks, 72 percent infested (frequency of attack), 25.70 attacks/m^2 (density of attack).
Response demonstrated in infested slash: Treated blocks - 20.45 attacks/m^2; Untreated blocks - 32.23 attacks/m^2. Still need to look at leave tree mortality. Problem with Ips flight period this year--it was 1 month late. How do we measure effectiveness of Pheromones? Need to develop a model for Ips beetle to predict flight.

R-10: Ips perturbatus in white spruce stands near Fairbanks. Field tested racemic Ipsdienol against (+) Ipsdienol and (-) Ipsdienol and combinations of the three pheromones using a randomized block design. Lindgren 12-funnel traps baited with the (-) Ipsdienol caught the most Ips perturbatus adults while racemic Ipsdienol caught the most checkered beetles. (Skeeter Werner)

PSW: Ips paraconfusus
- Trap-out study in Torrey pine using Ipsdienol.
- Flight periodicity study for sympatry with western pine beetle.
- Slash prevention study: Broadcast vs. piled. Piled treatment used 0, 2, and 5 baits per acre. Broadcast treatment used 25 and 50 per area. 5 caps worked for piled treatment.

DOUGLAS-FIR BEETLE:

R-2: MCH bubble caps to protect seed trees from Douglas-fir beetle. 5 paired plots, 2 caps/tree. 2 hits on bubble cap trees, 0 on check.

Baited log decks. Had dramatic spillover around treated decks. Hope to clean up localized population. Tried to get beetle populations aggregated as much as possible. Daterman working with new attractants. Can put traps in open areas and catch beetles.

R-4: Prevent Douglas-fir beetle attack in Douglas-fir stands. Four treatments: Baited Block with MCH bubble caps at 40 per acre on a grid. Bait only, MCH only, and untreated control. Douglas-fir beetle populations probably too low. Analysis continues. Report enclosed.

R-6 PNW: MCH to protect standing trees from Douglas-fir beetle with aerial application. Purchased MCH. Working on EA. Looking for suitable areas for testing.

SPRUCE BEETLE:

R-4: Baiting efficiency (standard Phero Tech bait). Used randomized block design with 5, 2, and 0 baits/acre plot. Analysis continues. Report enclosed.

Prevent spruce beetle attack in spruce stands. Four treatments: MCH bubble caps at 40/acre on a grid, bait only, MCH grid and baits, untreated control. Analysis continues. Report enclosed.

Opportunities to get more information on flight periods using pheromone traps.

R-10/PNW:

Developed a 5-year plan in 1988 to assess SB pheromone blends and release rates and to develop operational-use strategies for managing spruce beetle. (Werner/Holsten)

Field tested 3-component formulation at various release rates and the formulation of alpha pinene (0.7 mg/d), frontalin (0.1 mg;d), MCOL (0.5 mg/d) worked the best. SB pheromone blends and release rate field tests completed 1991. (Werner/Holsten/Borden/Wieser)

Field tested various pheromones of Ips, Dryocoetes, and Polygraphus to determine if competition from other species of bark beetles will reduce populations of spruce beetles in infested trees. Data not yet analyzed. (Werner/Holsten)

MCH field test. Aerial and ground application of MCH beads along a gas line right-of-way 16 miles long. Applied 4.6 and 9.2 kg/ha by helicopter and 4.6 and 13.8 kg/ha by ground to decks of logs along the side of the right-of-way. Aerial treatments showed no difference in treatment with untreated check. Ground application to log decks using the 13.8 kg/ha treatment showed significant results from control. Need a formulation of MCH that elutes at 16°C because of the cold microenvironment of the forest floor in Alaska. Delivery system is a problem and a new high-tech hopper is needed for future aerial applications. This could be shared throughout western US. A biodegradable bead is also desirable. (Werner/Holsten/Shea)

Spruce beetle expert system (SBexpert). A knowledge base system for management of spruce beetle in Alaska. This is an object-oriented system designed to provide advice on spruce beetle management, and more generally, information about the biology, ecology, and management of populations of spruce beetles. The prototype version is being developed jointly by PNW and FPM in Anchorage. SBexpert is a collection of four applications developed in the KnowledgePro Windows environment. The four applications are: Help application, SBtext application, SBsearch application, and SBrisk application. (Reynolds/Holsten)

PNW Dispersal studies with spruce beetle. Marked infested felled and standing trees with Day-Glo flourescent powder to determine range of dispersal of spruce beetles. Used directional and distance trapping system. Data not analyzed yet. (Werner).

WESTERN PINE BEETLE:

R-4 Pyrethroid - western pine beetle study - Ralph Thier reporting for Jim Hoffman.
Interim results: Several formulations of Esfenvalerate effective. Cyfluthrin (temporary) third year, better than Carbaryl. Study with lower rates in California gave 17 months protection with Tempo. Variation in mean attack height with diameter.

Baiting - western pine beetle.
Different densities. 10, 1-acre plots (1 bait, 2 baits, 0 baits). Data now being analyzed. Probably not enough beetles in area to exhibit treatment effect. Report enclosed.

R-5: Western Pine Beetle bait used to kill mistletoe infested trees (ponderosa pine) - Dave Schultz.

PSW: Wide variation release rate of bubble caps under field/lab conditions - Pat Shea.

Tested "lures" vs. "baits" - no difference, so tree baits less expensive could be substituted in funnel traps for the more expensive lures.

Flight periodicity study on Sequoia/Shasta NF's.

Interruption study with "97 + 3" with Ipsdienol and "50/50" with Ipsdienol. Ipsdienol better than verbenone.

SOUTHERN PINE BEETLE:

SFES: Handout provides a summary of ongoing SPB research activities of RWU-4501. Specifically with regard to SPB dispersal, using fluorescent powder self-marking technique and pheromone-baited traps for recapture (2%), mean dispersal distances of 1 km fall/spring and .5 km summer were estimated. Also studying how viable SPB are after dispersal--Kinn. Plan to evaluate control techniques (cut & leave, verbenone)--Turchin & Hayes.

TFS/R8 "Push/Pull Technique" using verbenone and frontalin to alter the direction of SPB spot growth is being evaluated by Ron Billings as a potential means of protecting RCW colonies. Initial tests look promising.

Verbenone using "sponge applicator" to inhibit spot growth. Verbenone plus felling actively infested trees worked best.

R8 SPB Arkansas spot growth model. Working to extend into winter months and learn more about winter biology of SPB.

ISPBEX - Expert system for SPB. Suppression module completed, work underway on infestation management module.

INFORMS - TX. Cooperative project with Doug Loh at Texas A&M. Being alpha tested on the NF's in Texas.

SPB Demonstration Area Project - Established on Oconee NF in Georgia and Homochitto NF in Mississippi. Best silvicultural practices intensified to prevent or minimize losses. Rapid direct control of all spots stressed. Link to annosus is being investigated.

TFS/R8 SPB Pheromone Traps to monitor/forecast trends. # SPB/trap per day and ratio of SPB to clerids are used to predict population trends. Overall is 79 percent accurate 89 percent accurate for declining and 38 percent for increasing populations).

FY 1992 - ASSIGNMENTS & PROJECTS

Rank	Project	Contact	FIDR	FPM	Funds ($M) Contributed	Total
	I. WESTERN BARK BEETLES:					
	Mountain Pine Beetle:					
4	Aerial application of verbenone in Lodgepole plus air sampling (changed)	Gibson/Shea		88.	10.	98.
6	Bubble cap application - Lodgepole/SNRA (repeat 1991 study - SNRA)	Gibson Thier/Amman	65.			65.
	Field bioassay of verbenone in Ponderosa Pine	Amman				
	Evaluation of Hazard Rating Systems	Gibson/Bentz		11.	17.	28.
	Efficacy of lure in sugar pine	Shea	80.			80.
	Western Pine Beetle:					
3	Field test of verbenone and ipsdienol combination ground applied beads or bubblecaps & flight periodicity	Wenz/Shea	22.	95.	15.	132.
	Field bioassay of verbenone & flight periodicity	Bennett		25.		25.
	Silvicultural practices in ponderosa pine	Schultz		42.		42.
	Ips sp:					
7	Ips pini field bioassay of verbenone + ipsdienol in ponderosa and lodgepole pine (flight periodicity)	Gibson/ Livingston		10.	12.	22.
	Ips pini flight periodicity & slash hazard	Schultz		5.		5.
8	Ips paraconfusus flight periodicity & slash study (statewide continued)	Wenz/Shea	22.	67.	15.	104.
	Ips perterbatus - Antiaggregate system Dispersal study - 5-year plan	Werner		25.	5.	30.
	Ips pini/calligraphus - flight periodicity, biology (resubmit/Bio/life history)	Gara/Dewey		30.	6.	36.
	Ips lecontei Identify attractant Validate slash treatment & Develop predictive tool	Wilson		20.		20.

Rank	Project	Contact	FIDR	FPM	Funds ($M) Contributed	Total
	Scolytus:					
	Silvicultural practices in true firs	Schultz		42.		42.
	Douglas-fir Beetle:					
2	Aerial MCH for standing green (Carryover from fy91)	Bridgwater, Sower, Thier		5.		5.
	Improve lure technology & trap placement	Daterman	75.			75.
	Small area/single tree strategies	Daterman	75.			75.
	Air sampling for natural emissions	Sower	100.			100.
	Spruce Beetle:					
1	MCH - 2nd year - Aerial - 13.8 kg/ha & ground - Ground - campgrounds using beads with a release rate at 16 C. - Area effect in mature stands	Werner/ Holsten/ Shea		47.	35.	82.
5	Field test operational use strategies using new pheromone blend of MCOL (5 yr plan)	Werner/ Holsten	50.	49.		99.
10	Data visualization (Recommend funding thru Integrated Systems	Munson Comm.)		225.	246.	471.
9	Expert System - 2nd year (Recommend funding thru Int. Systems Comm.)	Holsten/ Reynolds		27.	30.	57.
	Ips tridens to suppress spruce beetle competition study - 2nd year	Werner/ Holsten	50.			50.
	Lethal trap trees - standing	Munson		14.	15.	29.
	Dispersal/Flight periodicity	Werner	25.			25.
	Impact on wildlife habitat - Multi-year	Lessard		214.	108.	322.
	Develop technology to increase resistance of host to infestation by spruce beetles and blue stain fungi. Multi-year.	Werner/ Holsten/ Reynolds				

Rank	Project	Contact	FIDR	FPM	Funds ($M) Contributed	Total
	Southern Pine Beetle:					
	New for 1992:					
	- Risk Rate Pine Plantations	Negron/ Hedden				
	- Refine SPB Prediction System	Nettleton/ Billings				
	- Accoustical Survey	Drummond/ Nebeker				
	- Alternatives to Dursban/Lindane	Future project				
	- Aerial Application of Verbenone	Future project				
	Continuing:					
	- SPB Demonstration Area Project	Nettleton				
	- ISPBEX - Expert system	Oliveria/ Coulson				
	- INFORMS - TX	Oliveria/ Loh				
	- Arkansas Spot Growth Model	Drummond/ Stephen				
	- Antiaggregation Chemicals for SPB	Barry/ Berisford/ Payne				
	- Manipulation of SPB spots (Verbenone)	Clarke/ Billings				
	- SPB/Annosus interactions	Hess				
	GENERAL ITEMS:					
	Strategy for Pheromone Registration Issue	Holland/ Core Team				
	Service Contract for Testing Baits/Verbenone/MCH	Shea/Holland				
	Purchase of Buckets	Gibson				
	Pheromone Formulation Issue/Strategy	Holland/ Core Team				
	Develop Air Sampling Methodology	Sower				
	Sampling Design to Evaluate Area Affect of Pheromones on Beetles	Lessard				
	Unified Approach to Bark Beetle Dispersal(Western BB/SPB)	Hayes				
	Survey/Monitoring with Pheromones	Billings/ Livingston				