



**SHORT SUBJECTS  
AND TIMELY TIPS  
FOR PESTICIDE USERS**

Topic	Page No.
<b>BIOLOGICAL CONTROL, IPM, AND EXOTIC PESTS PEST CONTROL</b>	
Ground Breaking for New Agricultural Research Service Biological Control Lab	1-2
<b>CHEMICAL CONTROL</b>	
Evaluation of Tebufenozide Carry-Over and Residual Effects on Spruce Budworm (Lepidoptera: Tortricidae)	2
<b>REGULATORY</b>	
Sudden Oak Death Assembly Bill 2251	2-3
Endangered Species Protection Program Field Implementation	3
<b>HUMAN HEALTH</b>	
New Project Launched to Assess Environmental Health Issues of American Indians, Alaskan Natives	3
UI Lab Confirms First Cases of West Nile Virus in Canines, Squirrels	4
<b>MISCELLANEOUS</b>	
9 <sup>th</sup> Circuit Court Decision on the Douglas-Fir Tussock Moth Project in Region 6	4
UC Researchers Confirm Coast Redwood and Douglas-Fir as Hosts for Sudden Oak Death Pathogen	5
Spray Efficacy Research Group (SERG)	5-6
<b>ON THE INTERNET</b>	6
<b>PUBLICATIONS</b>	7
<b>UPCOMING EVENTS</b>	7-8
<b>CALL FOR ARTICLES</b>	8-9
<b>APPENDIX A</b>	

*Note: Files with the extension .pdf require Adobe Acrobat – download it free by clicking [here](#)*

**BIOLOGICAL CONTROL, IPM, AND EXOTIC PESTS PEST CONTROL**

**GROUND BREAKING FOR NEW AGRICULTURAL  
RESEARCH SERVICE BIOLOGICAL CONTROL LAB**  
(by Jim Core)

(Source: *ARS News & Information Online*, October 15, 2002)

A groundbreaking ceremony for a new facility “where researchers will develop methods for rearing, storing and using beneficial organisms against agricultural and urban pests” was held on October 15<sup>th</sup> in Stoneville, Mississippi. The lab is scheduled to open in December 2003. Research will focus on developing beneficial predators, parasites and microbes that farmers can use to control pests. According to Dr. Joe Jen, undersecretary for Research Education and Economics “The researchers hope to develop practical methods for producing and distributing control agents in quantities large enough to have significant impacts.” One wing of the lab will be set up for micro-organisms such as fungi or bacteria and another wing for macro-organisms such as nematodes and insects. A copy of the article is available online at <http://www.ars.usda.gov/is/pr/2002/021015.htm> or -

CONTACT: PAT SKYLER (CA)

(916) 454-0817  
[pskyler@fs.fed.us](mailto:pskyler@fs.fed.us)

### **CHEMICAL CONTROL**

Evaluation of Tebufenozide Carry-Over and Residual Effects  
on Spruce Budworm (Lepidoptera: Tortricidae)  
(B.L. Cardogan, R.G. Scharbach, R.E. Krause, and K.R. Knowles)

(Source: *J. Econ. Entomol.* 95(3):578-586, 2002)

“Abstract – Laboratory and field studies investigated carry-over effects of tebufenozide on spruce budworm, *Choristoneura fumiferana* (Clemens). In the laboratory, third and fourth instars were fed either sub lethal doses of tebufenozide (10 ppm) or water on *Abies balsamea* (L.) Mill. needles, reared to adulthood and allowed to oviposit on laying surfaces 1 or 14 d after being sprayed with water or tebufenozide concentrations of 17.5, 35.0, and 70.0 g/liter. Percentage adult emergence and sex ratio were not affected by larval ingestion of the tebufenozide. Also, the mean number of eggs laid on untreated wax paper by moths reared from tebufenozide-treated larvae was similar to the controls. Hence, tebufenozide did not inhibit carry-over effects on treated larvae. Oviposition on tebufenozide-treated wax paper by moths reared from untreated larvae was affected by both the substrate concentration and the age of the treatment residue. When offered treated and untreated laying surfaces simultaneously, *C. fumiferana* did not show a preference. However, significantly fewer eggs were laid on both laying surfaces by fewer females than when tebufenozide was absent. Residual tebufenozide on wax paper did not affect egg hatch but topical applications were toxic to eggs. Field studies appear to corroborate laboratory results and suggest that although the ingestion of tebufenozide by larval spruce budworm might not impair adult reproduction, the insecticide’s presence in the environment could inhibit oviposition. This inhibition was considered to be a primary factor in tebufenozide’s multi-year effects against spruce budworm populations.”

For a copy of the article –

CONTACT: PAT SKYLER (CA)

(916) 454-0817  
[pskyler@fs.fed.us](mailto:pskyler@fs.fed.us)

### **REGULATORY**

#### **SUDDEN OAK DEATH ASSEMBLY BILL 2251**

Signed by Governor Davis of California, Sudden Oak Death Assembly Bill 2251 establishes a program in the California Department of Forestry and Fire Protection (CDF) to detect; treat, if possible; or remove trees infected with *Phytophthora ramorum*. The bill encourages tree

management and requires CDF and the California Department of Food and Agriculture to cooperate

in enforcing *P. ramorum* quarantines. The complete text of the bill is online at [http://www.leginfo.ca.gov/pub/01-02/bill/asm/ab\\_2251-2300/ab\\_2251\\_bill\\_20020925\\_chaptered.html](http://www.leginfo.ca.gov/pub/01-02/bill/asm/ab_2251-2300/ab_2251_bill_20020925_chaptered.html) or –

CONTACT: PAT SKYLER (CA)

(916) 454-0817  
[pskyler@fs.fed.us](mailto:pskyler@fs.fed.us)

### **ENDANGERED SPECIES PROTECTION PROGRAM FIELD IMPLEMENTATION**

(Source: Federal Register Online, December 2, 2002, Vol. 67, Number 231, pp. 71549-71561)

“SUMMARY: EPA’s Office of Pesticide Programs is describing, and requesting comment on, implementation of its Endangered Species Protection Program (ESPP, or the Program). The goal of the ESPP is to carry out responsibilities under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) in compliance with the Endangered Species Act (ESA), while at the same time not placing unnecessary burden on agriculture and other pesticide users. This Notice describes how EPA proposes to implement its responsibilities under section 7(a) (2) of ESA by completing and upgrading County Bulletins, amending pesticide labels to reference County Bulletins, and enhancing monitoring programs. ....”. Comments, identified by docket ID number OPP-2002-0311, must be received on or before March 3, 2003. A copy of the notice can be found online at <http://www.epa.gov/EPA-SPECIES/2002/December/Day-02/e30463.htm> or -

CONTACT: PAT SKYLER (CA)

(916) 454-0817  
[pskyler@fs.fed.us](mailto:pskyler@fs.fed.us)

### **HUMAN HEALTH**

#### **NEW PROJECT LAUNCHED TO ASSESS ENVIRONMENTAL HEALTH ISSUES OF AMERICAN INDIANS, ALASKAN NATIVES**

(Source: EPA Pesticide Program Update 10/24/02)

EPA and the National Indian Council on Aging (NICOA) have entered into a cooperative agreement to conduct a national assessment of environmental and health risks among American Indians and Alaskan Natives. EPA has awarded NICOA \$85,000 to complete the project. The project’s objective “is to improve the understanding of the relationship between the environment and health and the factors that can be detrimental to the health of all American Indians and Native Alaskans.” As a result of this project, recommendations will be made on ways to address those hazards. In a previous study, it was found that American Indian elders experience 44% more asthma attacks than the general aging population. A series of publications will be published to increase awareness of environmental hazards common among American Indians and Native Alaskans. The project will be conducted in partnership with the University of New Mexico. For a copy of 10/24/02 Update contact Pat Skyler (916) 454-0817. For additional information -

CONTACT: EPA (DC)

(703) 305-5017

**UI LAB CONFIRMS FIRST CASES OF WEST NILE  
VIRUS IN CANINES, SQUIRRELS**

(Jim Barlow, Life Sciences Editor)

(Source: News Bureau, University of Illinois at Urbana-Champaign, 9/17/02)

The Illinois Department of Public Health laboratory in Chicago and medical entomologist Robert Novak, State Natural History Survey, University of Illinois have confirmed the nation's first documented cases of domestic canine and squirrel deaths from West Nile virus. "The deaths of two squirrels in Chicago and one in Champaign, an 8-year-old dog (an Irish setter-golden retriever mix) in Bloomington-Normal, and a 3-month-old wolf from a small zoological collection in suburban Will County (southwest of Chicago) are positively linked to West Nile."

For a copy of the article contact –

CONTACT: PAT SKYLER (CA)

(916) 454-0817  
[pskyler@fs.fed.us](mailto:pskyler@fs.fed.us)

**MISCELLANEOUS**

**9<sup>TH</sup> CIRCUIT COURT DECISION ON THE DOUGLAS-FIR  
TUSSOCK MOTH PROJECT IN REGION 6**

(Source: State and Private Forestry, Forest Health Protection, Weekly News Item, November 26, 2002)

On November 4, 2002 the United States Court of Appeals for the ninth circuit issued a decision in the case of League of Wilderness Defenders vs. Harv Forsgren, Regional Forester, USDA Forest Service, Pacific Northwest Region. The case was on appeal from the United States District Court for the District of Oregon. The Court included that the aerial spraying of pesticides being conducted by the Forest Service is point source pollution and requires an NPDES permit under the Clean Water Act. The Court instructed the district court to enjoin the Forest Service from further spraying until the agency adequately analyzes pesticide drift in a supplement to the Environmental Impact Statement and obtains an NPDES permit. The Forest Service believes that its forest health and management activities within the jurisdictional boundaries of the Court will be negatively affected by this decision. In addition, there are legal implications that could impact other national pest control and fire fighting activities. Therefore, the Agency has forwarded to the Office of General Counsel, a recommendation to seek an *en banc* rehearing by the U.S. Court of Appeals.

The Opinion is available online at

<http://www.ca9.uscourts.gov/ca9/newopinions.nsf/web+search+simple>. Once you reach this page, type in 01-35729 in the search window or –

CONTACT: PAT SKYLER (CA)

(916) 454-0817  
[pskyler@fs.fed.us](mailto:pskyler@fs.fed.us)

**UC RESEARCHERS CONFIRM COAST REDWOOD AND  
DOUGLAS-FIR AS HOSTS FOR SUDDEN OAK DEATH PATHOGEN**

(Sarah Yang, Media Relations)

(Source: News Release, 9/4/2002, University of California, *Campus News*, Berkeley, CA)

“Berkeley – Two of California’s most highly prized trees – coast redwood and Douglas-fir – are susceptible to *Phytophthora ramorum*, the pathogen that causes Sudden Oak Death...”

“Researchers from UC Berkeley and UC Davis have isolated living cultures of *P. ramorum* from the branches and needles of coast redwood and Douglas-fir saplings that had shown symptoms of infection.”

There are now 17 known species worldwide that are susceptible to *P. ramorum*, 16 of them are found in California. The researchers are not sure what these new findings will mean for the health of redwoods and Douglas firs in the long run. “It may take years before we can start answering questions about the ecological impacts of the disease on coast redwood and Douglas fir,” said David Rizzo, UC Davis.

The press release is online at [http://www.berkeley.edu/news/media/releases/2002/09/04\\_SOD.html](http://www.berkeley.edu/news/media/releases/2002/09/04_SOD.html)  
or -

CONTACT: PAT SKYLER (CA)

(916) 454-0817

[pskyler@fs.fed.us](mailto:pskyler@fs.fed.us)

**SPRAY EFFICACY RESEARCH GROUP (SERG)**

The Spray Efficacy Research Group (SERG) is an association of North American forest managers, regulatory and research agencies, and pesticide suppliers interested in forest pest management. The primary aim of SERG is to improve application technology and pest management methods associated with the use of pest control products in the context of integrated forest pest management. SERG facilitates efficient use of resources by providing a coordinated scientific approach to research to meet the needs and priorities of forest managers. Through this coordinated approach, members of SERG are able to pool their resources, leverage other sources of funding, and work cooperatively to conduct research and share results amongst the members.

Over the years, SERG has been instrumental in supporting research to develop integrated pest management programs to control numerous forest defoliators in Canada. For example, early intervention strategies for Spruce Budworm are currently being evaluated in order to reap the benefits of improved timber supply with reduced pesticide use. In support of these programs, decision support systems are being constructed and have been used in the management of Budworm and Gypsy Moth in Canada and the USA. SERG continues to support efficacy research into the development of more environmentally acceptable pest-control products (high potency Bt, Mimic, Neem, viruses, etc.). Coupled with these trials, improved delivery techniques (DGPS, flow control, boom control, deposit optimization strategies, airborne met packages) have been evaluated for incorporation into operational programs.

Each year, SERG holds a workshop to enhance the interchange of information amongst participating organizations as well as between SERG and research/user groups. At these workshops, current-year

research programs are presented in the areas of forest pest management products, application technology improvement and environmental impact and benefits of forest pest management strategies. This year's workshop was held November 7-9, 2002 immediately following the Annual Gypsy Moth Review in Niagara Falls, Canada.

SERG also has available 49 reports that can be ordered online at <http://www.sergreport.net/reports/> and will be shipped free of charge. See **Appendix A** at the end of this information letter for a listing of the report titles.

For additional information –

CONTACT: BOB MICKLE (CANADA)

(519) 632-5006  
[remspc@golden.net](mailto:remspc@golden.net)

### **ON THE INTERNET**

(Source: *Biological Conservation Newsletter*, No. 214, October 2002) – World Atlas of Biodiversity is an outstanding new web site from the United Nations Environment Programmes World Conservation Monitoring Center (UNEP-WCMC). Like other GIS-based programs, the features of this web site can be useful in demonstrating spatial patterns of environmental problems. Users can choose from dozens of map layers (derived from biodiversity and related data) to superimpose on geographical maps of the planet on a global, regional, or even local scale. Manipulating the maps is relatively straightforward. You do not have to be familiar with GIS programs to use the web site. Locate it online at <http://stort.unep-wcmc.org/imaps/gb2002/book/viewer.htm> (may need to double click on the url).

The Office of Pesticide Programs Registration Division's fiscal year 2003 Work Plan is now available online at <http://www.epa.gov/opprd001/workplan/>. The work plan represents the current list of potential conventional chemical registration candidates for review and possible decision-making during the current fiscal year. Also at the same website is the fiscal year 2002 Report of Conventional Pesticide Registration Decisions.

(Re. Sudden Oak Death) Host Plants, Other Environmental Factors Being Studied for Clues, by Michael Coit, *The Press Democrat*, Sept. 22, 2002. The article discusses the completion by the USDA Forest Service of a nationwide risk map to help direct surveys for Sudden Oak Death (SOD). The map shows 13 states where the risk for SOD is high. In California, a cooperative effort between the Forest Service and Cal-Poly involved aerial surveying of some 20 million acres of potential SOD habitat, ranging from the Oregon border south to Los Angeles County and along the western edge of the Sierra Nevada. Satellite imagery and digital camera images helped target potential hot spots for SOD. The article can be viewed at <http://www.pressdemocrat.com/search/#archive>, in the search box type in 0209220553.

Race is On to Unravel Mystery of Tree Disease – Sudden Oak Death is little understood, but clearly it is potentially devastating, by Edie Lau, *The Sacramento Bee*. View it at <http://www.sacbee.com/content/news/story/4963786p-5974621c.html>.

100 of the World's Worst Invasive Alien Species. The booklet (11 pp.) was compiled by the Invasive Species Specialist Group (ISSG). It is available online at <http://www.issg.org/booklet.pdf>.

Maps of the ranges of tree species in North America compiled by Elbert Little, USDA Forest Service, and others have been digitized for use in USGS's vegetation climate modeling studies. The



digital map files are available for download at <http://climchan.ge.cr.usgs.gov/data/atlas/little>. Maps are available in Arc-View shape file format. Geographic ranges are represented as polygons. There is one shape file (with associated data files) for each tree species.

### **PUBLICATIONS\***

Alfaro, R.I., J.H. Borden, J.N. King, E.S. Tomlin, R.L. McIntosh and J. Bohlmann. 2002. Mechanisms of resistance in conifers against shoot infesting insects. Chapter 4, Mechanisms and Deployment of Resistance in Trees to Insects, M.R. Wagner et al. (eds.), pp. 105-130.

Denslow, J.S. 2002. Invasive alien woody species in Pacific Island forests. Invasive Species Unit, Institute of Pacific Islands Forestry, USDA Forest Service, Hilo, HI. Available online at <http://www.fao.org/DOCREP/004/Y3582E/y3582e14.htm>. (Source: *Unasylva*, Vol. 53-2002/2)

Hogg, E.H., J.P. Brandt and B. Kochtubajda. 2002. Growth and dieback of aspen forests in northwestern Alberta, Canada, in relation to climate and insects. *Can. J. For. Res* Vol. 32, No. 5, pp. 823-832.

USDA Forest Service in cooperation with the Western Forestry Leadership Coalition. 2002. Western bark beetle report – A plan to protect and restore western forests.

\*Note: If you would like a copy of any of the above publications, contact Pat Skyler (916) 454-0817, [pskyler@fs.fed.us](mailto:pskyler@fs.fed.us).

### **UPCOMING EVENTS**

14-16 January 2003. 24<sup>th</sup> Annual Forest Vegetation Management Conference: Moving Forward By Looking Back, Redding, CA. Contact: Sherry Cooper (530) 224-4902, Fax (530) 224-4904, Email: [shcooper@ucdavis.edu](mailto:shcooper@ucdavis.edu).

14-17 January 2003. 14<sup>th</sup> USDA Interagency Research Forum on Gypsy Moth and Other Invasive Species, Annapolis, MD. Contact: Katherine McManus (203)230-4330, Email: [kmcmanus@fs.fed.us](mailto:kmcmanus@fs.fed.us) or visit their website at <http://www.fs.fed.us/ne/morgantown/4557/forum2003>.

19-22 January 2003. California Weed Science Society Annual Meeting – Our Weeds, Our World, Santa Barbara, CA. Contact: Bruce Kidd (909) 698-3081, Judy Letterman or Celeste Elliott (831) 442-0883. Visit their website at <http://www.cwss.org/conf.htm>.

28-29 January 2003. An Invasive Plant Workshop and Seminar, Houston, TX. Held in conjunction with The Southern Weed Science Society 2003 Annual Meeting (January 27-29, 2003). Contact: April Fletcher, (505) 248-6632, Email: [April.Fletcher@fws.gov](mailto:April.Fletcher@fws.gov) or visit their website at <http://www.weedscience.msstate.edu/swss/>.

10-14 February 2003. Weed Science Society of America Annual Conference, Jacksonville, FL. Contact: Rhonda Green (800) 627-0629 ext. 220 or (785) 843-1235 or visit their website at [https://timssnet.allenpress.com/ECOMWSSA/Timssnet/Meetings/tnt\\_meetings.cfm](https://timssnet.allenpress.com/ECOMWSSA/Timssnet/Meetings/tnt_meetings.cfm).

24-28 February 2003. National Invasive Weed Awareness Week IV, Washington, DC. Visit their website at <http://www.nawma.org/> and **click on NIWAW** on left side of screen.

2-6 March 2003. American Mosquito Control Association Annual Meeting, Minneapolis, MN.

Contact: AMCA Central Office (732) 544-4645 ext. 11 or visit their website at <http://www.mosquito.org/Meeting2003/indexMinn03.html>.

11-13 March 2003. Western Society of Weed Science Annual Meeting, Poipu Beach, Koloa, HI. Contact: Wanda Graves (510) 790-1252, Email: [Wgraves431@aol.com](mailto:Wgraves431@aol.com) or visit their website at [http://wsweedscience.org/events/event\\_detail.php?eventID=10](http://wsweedscience.org/events/event_detail.php?eventID=10).

8-10 April 2003. 4th National Integrated Pest Management Symposium, Indianapolis, IN. Contact: Elaine Wolff, (217) 333-2881, Fax: (217) 333-9561, Email: [ipmsymposium@ad.uiuc.edu](mailto:ipmsymposium@ad.uiuc.edu) or visit their website at <http://nautilus.outreach.uiuc.edu/conted/conference.asp?ID=244>.

14-17 April 2003. Western Society of Weed Science, Noxious Weed Management Short Course for Land Managers, Loveland, CO. Contact: Celestine Duncan (406) 443-1469, Email: [weeds1@ixi.net](mailto:weeds1@ixi.net).

27 April – 2 May 2003. XI International Symposium on the Biological Control of Weeds, Canberra, Australia. Contact: Sharon Corey + 61 (2) 6246 4001, Email: [sharon.corey@csiro.au](mailto:sharon.corey@csiro.au) or visit their website at <http://www.ento.csiro.au/weeds2003/index.html>.

15-18 June 2003. 2<sup>nd</sup> Annual Precision Forestry Symposium, Seattle, WA. Contact: Forestry Continuing Education Program (206) 543-0867 or visit their website at <http://www.cfr.washington.edu/outreach/PreFor/>.

6-11 July 2003. 15<sup>th</sup> International Plant Protection Congress, Beijing, China. Contact: William Chen (86-10) 6210 3108, Email: [cicast@public.bta.net.cn](mailto:cicast@public.bta.net.cn) or visit their website at <http://www.ipmchina.net/ippc/>.

8-11 September 2003. Biennial National Silviculture Workshop, Silver Creek, CO. Contact: Monty Maldonado (202) 205-5683 or Clark Baldwin (703) 605-5178.

21-28 September 2003. XII World Forestry Congress, Quebec, Canada. Contact: 1 (418) 694-2424, Fax: 1 (418) 694-9922, Email: [sec-gen@wfc2003.org](mailto:sec-gen@wfc2003.org) or visit their website at <http://www.wfc2003.org/>.

3-8 November 2003. 7th International Conference on the Ecology and Management of Alien Plant Invasions, Miami, FL. Contact: [tkoop@fig.cox.miami.edu](mailto:tkoop@fig.cox.miami.edu) or visit their website at <http://www.bio.miami.edu/iirm/emapi7/>.

### **CALL FOR ARTICLES**

Please forward to me all articles, meeting announcements, publications, reports, or other items of interest that you would like included in the next issue of Short Subjects & Timely Tips for Pesticide Users. Please include the name, State, and telephone number of the individual who can be contacted for further information:

CONTACT: PAT SKYLER (CA)

(916) 454-0817/Fax (916) 454-0820

Email: [pskyler@fs.fed.us](mailto:pskyler@fs.fed.us)

---

The Washington Office, Forest Health Protection, Forest Health Technology Enterprise Team sponsors, compiles, edits, and distributes this informal information letter as a means of providing current information to forestry pesticide users. Recent copies can be viewed online at <http://www.fs.fed.us/foresthealth/pesticide/news.htm>. Comments, questions, and



items of input are welcome and may be sent to Pat Skyler, Editor, USDA Forest Service, Remote Sensing Lab, 1920 20<sup>th</sup> Street, Sacramento, CA 95814, or by E-mail: [pskyler@fs.fed.us](mailto:pskyler@fs.fed.us). Reference to a commercial product or source in this information letter does not constitute endorsement by the USDA Forest Service. Information should be verified by contacting the original source of information as neither the editor nor the USDA Forest Service guarantees the accuracy of the information provided in this information letter. Pesticides can be injurious to humans, domestic animals, desirable plants, and fish or wildlife if they are not handled or applied properly. Use all pesticides in accordance with label precautions.

The USDA prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, and so forth) should phone USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write: USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14<sup>th</sup> and Independence Avenue, S.W., Washington, DC 20250-9410, or call (202) 720-5964 (voice or TDD). USDA is an equal opportunity provider and employer.

APPENDIX A  
SERG Reports

2002

- 1) Environmental Fate and Effects of Neemix 4.5 in Forest Ponds.
- 2) Development of a Consistent Trap-Bait and Trapping System for Jack Pine Budworm (*Choristoneura pinus pinus*)
- 3) Development of Tools for Integrated Pest Management of Eastern Hemlock Looper (*Lambdina fuscicollis fuscicollis* (Gn.)): Assessment & Refinement of Forecasting Methods for Predicting Populations & Defoliation.
- 4) Influence of Drought Stress on Glyphosate Uptake and Translocation in Raspberry Plants (*Rubus idaeus* L.): Part II. Droughtness Detection Using Hyperspectral & Thermal Infrared Remote Sensing.
- 5) To Develop and Test Pheromone Formulations for Use in Early Intervention Strategies of the Spruce Budworm – Year 2.
- 6) Development of a Pest Management System for the Balsam Fir Sawfly (*Neodiprion abietis* spp.): A Compendium of Reports on Efficacy Trials, Laboratory Evaluations and Impact of Spraying on Terrestrial Arthropods, 1999, in Newfoundland.
- 7) Balsam Fir Sawfly – Cape Breton 1999 Research Programme.
- 8) A Demonstration and Dosage Trial of Neemix 4.5 for Management of Pine False Webworm in Ontario.
- 9) Absorption and Translocation of Glyphosate and Triclopyr in Forest Weed Species.
- 10) Optimum Droplet Method: A Technique to Evaluate the Toxicity of *B.t.k.* Formulations Against Spruce Budworm Larvae.

2001

- 11) 2001 SERG Workshop Proceedings
- 12) Field Trials Against Eastern Hemlock Looper with *Bacillus thuringiensis* and Lafivirus, New Brunswick, 2001.
- 13) To Develop and Test Pheromone Formulations for Early Intervention Management Strategies of the Spruce Budworm.
- 14) Early Intervention Against Spruce Budworm: High Dosage Foray 96B in Ontario in 2000.
- 15) Results of Aerial Application Trials of Dylox® 420 at Three Dosage Rates Against the Balsam Fir Sawfly (*Neodiprion abietis* spp.) in Newfoundland in 1998.
- 16) Development of an Integrated Pest Management Program for the Whitemarked Tussock Moth (*Orgyia leucostigma*) in Nova Scotia, 1998.
- 17) Evaluation of the Efficacy of Foray 96B (ABG-6470) Against Spruce Budworm in Ontario in 1998.
- 18) Results of a Neemix® 4.5 Experimental Spray Program Against the Yellowheaded Spruce Sawfly (*Pikonema alaskensis*) in Central Newfoundland, 1999.

2000

- 19) 2000 SERG Workshop Proceedings.
- 20) An Evaluation of the Auto Cal Flow Controller
- 21) Susceptibility and Vulnerability of Third-Instar Larvae of the Spruce Budworm (Lepidoptera: Tortricidae) to *Bacillus thuringiensis subsp. kurstaki*.
- 22) 1999 Efficacy Trials for the Aerial Application of Bioprotec® and Thuricide® 48LV, 76LV, and 96LV.

## 1999

- 23) 1999 SERG Workshop Proceedings
- 24) Evaluation of the ADAM Field Kit for Operational Assessment of *Bacillus thuringiensis* Spray Deposits on Coniferous Foliage.
- 25) Optimization Trials for Insecticide Spraying Into Small Blocks – Murdochville Results.
- 26) Development of an Integrated Pest Management Program for the Eastern Hemlock Looper (*Lambdina fiscellaria fiscellaria*).

## 1998

- 27) 1998 SERG Workshop Proceedings.
- 28) Developing Effective Strategies for Managing Current and New Epidemics of Spruce Budworm Component 4: Improvement and Demonstration of Spray Control Systems. Results of 1997 Field Trials.
- 29) Cooke's *B.t.* Efficacy Model: User's Guide to a Decision-Support Tool for Control of Spruce Budworm Populations with *Bacillus thuringiensis*.

## 1997

- 30) 1997 SERG Workshop Proceedings.
- 31) Indirect Effects of Forest Spraying with Lepidoptera-Specific Insecticides on Forest Songbirds.
- 32) BioSIM Refinement – Assessment of Maritime Influences on the Extrapolation of Temperature Data.
- 33) How Do Wind, Atmospheric Stability, Relative Humidity and Temperature Affect the Path, Destination and Efficacy of Spray Drops at the Time of Application?

## 1996

- 34) 1996 SERG Workshop Proceedings.
- 35) 1996 GPS Workshop Proceedings.
- 36) Effect of Droplet Size Spectrum and Application Rate on Field Efficacy of *Bacillus thuringiensis*.
- 37) Capabilities of Global Positioning System and Data Logging Equipment to Guide, Track and Record Application History of Aircraft and Ground Sprayers in Forest Operations.
- 38) Trials in Real-Time Data-Logging/DGPS Navigation for Aerial Pesticide Applications.
- 39) Preliminary Study to Investigate the Enhancement of *B.t.* Toxicity with Tannic Acid.

## 1995

- 40) 1995 SERG Workshop Proceedings.
- 41) Determination of Optimum Drop Sizes of RH5992 (MIMIC 2F) Against Spruce Budworm Larvae for Stomach and Contact Toxicity.
- 42) Evaluation of Quality and Quantity of *B.t.* (*Bacillus thuringiensis*) Spray Deposition on White Spruce (*Picea glauca*)
- 43) Airborne Atmospheric Measurement for Improved Spray Conditions: Operational Evaluation of New Technology for Monitoring Meteorology Conditions.
- 44) Refinement of Degree-Day Methods of Prediction of Larvae Development of the Eastern Spruce Budworm.

## 1993

- 45) A Generic Approach to Setting Buffer Zones in Canada.
- 46) Refinement of Degree-Day Methods of Prediction of Larval Development of the Eastern Spruce Budworm.

1991

- 47) A Quantitative and Qualitative Field Evaluation & Comparison of Three Aerial Insecticide Application Systems Used in Forest Management.

1990

- 48) An Account of Spray Trials Conducted to Evaluate the Efficacy of B.t. Against High Spruce Budworm Populations.

1985

- 49) Assessment of the Influence of Concentration and Foliar Deposition on the Efficacy of *Bacillus thuringiensis*