

# Bugs & Diseases

20<sup>th</sup> Anniversary Edition

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## Bugs & Diseases reaches a milestone

For the last 20 years, “Bugs and Diseases” has been providing readers with interesting and useful information. Many conversations have been spurred on by the tidbits of data, descriptions and occasional poems that a reader may pick up. Whether that be a conversation with the kids around the supper table, ice-breakers at a party, or simply starting a friendly chat with a stranger on the bus, “Bugs and Diseases” has had a helping hand.

We at Bugs & Diseases Inc. would like to thank all the people who have contributed to the success, popularity, and longevity of this publication by providing ideas and articles throughout the years. Without your support, we could not have had such a good run! So with that, we encourage you to sit back, put your feet up, and enjoy this first edition of the 20<sup>th</sup> anniversary.

*Mike Maximchuk*

## A trip down memory lane

In 1987, the Forest Insect and Disease Section arose much like the mythical Phoenix, from the “ashes” of a mountain pine beetle outbreak that occurred from 1980-1986.

Hideji Ono was the first Manager of the Forest Insect and Disease Section which operated under the wings of the Forest Protection Branch, located at the current Provincial Warehouse building. Hideji ran a one-person operation until 1989, when I joined the Section. Since then, this Section has grown in leaps and bounds to reach a 27-strong staff — 10 at headquarters in Edmonton and 17 strategically located across the province.

The year of 1997 was a banner-year in Forest Health. That year, the Insect and Disease Section was re-named the Forest Health Section (FHS) and regionalized with the appointment of a small number of Forest Health Officers. In 1999, Forest Health was merged with the Forest

Management Branch. Dan Lux succeeded Hideji as FHS Manager in 2008.

*“After its inception, the first major challenge faced by the forest health program was a spruce budworm outbreak, detected in 1987...”*

After its inception, the first major challenge faced by the forest health program was a spruce budworm outbreak, detected in 1987 in the Chinchaga River basin of the Footner Lake Forest.

More budworm outbreaks were detected in quick succession at Hawk Hills in the Peace River Forest, Eaglesham in the Grande Prairie Forest, and Bovine Creek in the Lac La Biche Forest. *Continued...*

## Alberta's eye on forest health

### Issue highlights:

- |   |   |
|---|---|
| Adaptive management in action                 | 3 |
| A tale of two caterpillars                    | 3 |
| Metis Settlements join the battle against MPB | 4 |
| Maxi's top 10 list                            | 5 |
| Pesticides—be careful how you use them        | 5 |
| Photo spread                                  | 6 |

The first-ever aerial spray operation to control the spruce budworm in Alberta was carried out in late spring of 1989 at Eaglesham. In this operation, an ultra-low volume spray of the Btk (*Bacillus thuringiensis* var. *kurstaki*) bacterium was applied to protect spruce foliage of over 1000 budworm-infested hectares, as it was done in eastern Canada. The operation failed and became an eye opener on the need for planning pest management programs based on the ecology of the pests under local conditions. Consequently, with the help of the Canadian Forest Service, a budworm ecology-based prescription that advocated population suppression was made to keep infested trees alive. This prescription worked well.



*The morning sun greets a busy runway in northwest Alberta, as crew members prepare aircrafts for spruce budworm spraying. Circa 1990.*

In early aerial applications, pilots navigated spray aircraft using maps with manually drawn spray lines. In the early 1990s Alberta pioneered the use of 'state of the art' spray technology in Canada by introducing the use of faster and bigger spray aircraft guided by a satellite-based differential global positioning system. The GPS-based digital maps of spray blocks were loaded onto onboard computers that guided the pilot. At the end of each spray run the data were downloaded to make accurate maps of spray lines. At its peak, over 200,000 hectares of infested forest stands were annually sprayed under the spruce budworm management program.

In the late 1990s, the mandate of the forest health program was broadened to include management of invasive alien plant species in the Green Zone of the province.

In 1992, the forest health program was instrumental in setting up the Annual Alberta-BC Intermountain Forest Health Working Group and initiating formation of the "Critical Plant Pest Infestation Response Plan," the first-of-its-kind in Canada.

In 1996, the Canadian Forest Service discontinued the Forest Insect and Disease Survey (FIDS). So, the forest health program assumed the responsibility to carry out the annual forest health aerial overview surveys in the province. The Alberta Forest Health Annual Report was first published in 1997 to replace the FIDS Annual Report.

Since 1992, the forest health program used pheromone baits to monitor the mountain pine beetle activity along the Alberta-British Columbia border. Low level MPB activity was recorded along the border areas in southwest Alberta until 1998, when there was a noticeable increase. In the following year, MPB infested trees were detected in Banff National Park, Jasper National Park and Willmore Wilderness Park. In 2002, MPB infestations spilled over to the managed Crown forest in the Green Zone. The forest health team has again risen up to meet the challenge posed by the

MPB. A three-pronged strategy aimed at prompt detection and control, decreasing spread and outbreak potential, and minimizing losses is used in this program. A science-based and innovative decision support system is being used to direct actions to contain infestations, minimize spread along the Eastern Slopes, and prevent further eastward spread of the MPB.

Thus, in 20 years Forest Health in Alberta has come full circle, battling the beetles again, déjà vu!

*Sunil Ranasinghe*

## Adaptive management in action: MPB decision support tools

To manage mountain pine beetles (MPB) in Alberta, SRD is utilizing the information obtained through the B.C. and US experiences. In doing so, we have noticed many anomalies in the beetles' behavior that were not yet documented. The best available management tools were developed in the beetles' historical range, yet they may not be entirely accurate when applied to ecosystems east of the Rocky Mountains and north of Banff, where MPBs did not exist historically.

To tackle this uncertainty, the Pacific Forestry Centre - Canadian Forest Service has helped SRD adapt British Columbia's MPB management tools for Alberta. Following an adaptive management approach, SRD is supporting a research project that will help to further tailor the management tools to the MPB in Alberta. Dr. Allan Carroll and his team are investigating the productivity of MPB populations in the Grande Prairie area. They are also quantifying the potential for population eruptions, rates of increase and spread.

*"...SRD is supporting a research project that will help to further tailor the management tools to the MPB in Alberta."*

So far, the researchers have found that MPBs are able to effectively produce brood in lodgepole – jack pine hybrid trees. While beetles in B.C. were recorded to produce approximately 12 offspring per female, the Alberta beetles produced 20 to 28 offspring per female. The research suggests that trees in this novel habitat showed lower defensive capacity which may allow for rapid local population increases. Brood development did not differ between lodgepole and hybrid trees.

The study is to be completed by March 2010.

To continue improving its forest health program, SRD is supporting other research studies, including MPB productivity in whitebark pine, MPB winter mortality modeling, MPB system genetics, the impacts of prescribed burns on local MPB populations, forest tent caterpillar outbreak patterns, and invasive species immigration to Alberta.

*Anina Hundsörfer*

## A tale of two caterpillars

All indicators point toward very different population trends for two important defoliator species in the Waterways and Lac La Biche Area (WW/LLB). For spruce budworm (SBW) and forest tent caterpillar (FTC), the summer of 2009 may hold vastly different fortunes. For some it will be the best of times, and for others it will be the worst of times.

Spruce budworm populations have been on the increase in the northeastern part of the province for some time, and this is expected to continue in 2009. Our 2008 pheromone

trap counts were generally higher (and in many cases much higher) than those recorded in 2007. In Waterways, all but two of 22 sites had counts indicating a high risk of SBW outbreaks in 2009, and all but four sites had greater counts than the previous year. Additionally, in Waterways, egg mass samples (taken from a number of sites throughout the area) appear to forecast widespread, severe SBW defoliation this year. In the Lac La Biche area, counts from our pheromone sites were much higher. *Continued...*



*Spruce budworm and forest tent caterpillar larvae.*



We may see more defoliation further south, than we have for quite some time. All in all, for SBW populations in the WW/LLB Area, 2009 should be a very good year.

For forest tent caterpillar populations in the northeast, a different story will probably unfold this year. FTC has done very well over the past couple of years – defoliating around one million hectares of aspen stands in 2007 and 2008 (primarily in Waterways). However, egg mass surveys conducted in the fall and winter predict that popu-

*“Residents of Ft. McMurray should be relieved to find out that (FTC) egg masses were hard to find around their city.”*

lations will decline dramatically in 2009. Residents of Ft. McMurray should be relieved to find out that egg masses were hard to find around their city. A few sites with high numbers of egg masses were found in areas near Janvier, Christina Lake, and Conklin. However, it appears that FTC will be far lower over most of the WW/LLB area this season.

*Tom Hutchison*

## Métis Settlements join the battle against MPB

There are eight Métis Settlements in the Province of Alberta. Three of these are situated in the Lesser Slave Area:

East Prairie Settlement: 33,342 ha; Population – 551

Peavine Settlement: 89,923 ha; Population – 623

Gift Lake Settlement: 86,237 ha; Population – 911

Aerial surveys in the fall of 2007 detected MPB-attacked trees on the Peavine Settlement. This was the first time MPB had been detected on Métis Settlement lands. A provincially-funded contract similar to the municipal grant program was established between SRD and the Peavine Settlement. SRD provided technical support to the Settlement members who undertook the survey and control of the infested trees. Sixteen sites were surveyed and 47 MPB infested trees were controlled during the winter of 2007/2008.

Aerial surveys in the fall of 2008 detected more MPB faders on the Peavine Settlement as well as newly infested areas on the East Prairie Settlement. Once again, a provincially-funded program was set up with both Settlements to survey and control MPB infested trees on these lands. SRD arranged training for Settlement members and provided technical support.

East Prairie began the survey and control of infested trees before Christmas and finished in January 2009. Forty sites were surveyed and 52 MPB infested trees controlled. Peavine began their survey and control program in March of 2009. The majority of the surveying has been completed with 215 infested trees identified. These trees will be controlled this spring.

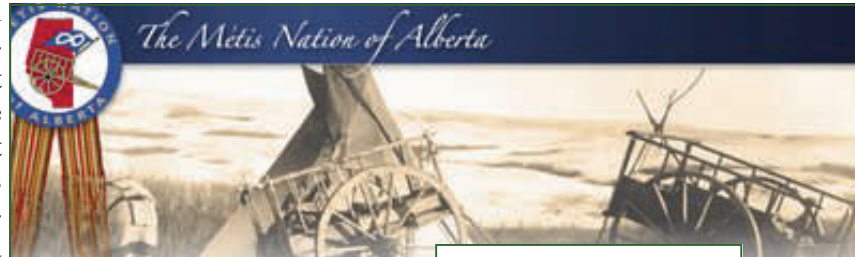
No MPB was detected on the Gift Lake Settlement, but SRD and the Settlement representatives have discussed the possibility. It was agreed that a survey and control program could be initiated if an infestation does occur.

This current work has benefited both parties.

SRD has an additional partner in the fight against MPB, and the Métis Settlements have realized a new

opportunity. The program has created employment on the Settlements and it also gave the members the training and experience that they may need to bid on provincial MPB survey and control contracts in the future.

*Dale Thomas*



**MOUNTAIN  
Pine Beetle  
Action**



## Maxi's top 10 list

Tonight's category ladies and gentlemen... the top 10 thoughts of a male mountain pine beetle.

Here we go...

#10. Would it kill her to clean up around here?  
This gallery is a pig-sty!

#9. Oh geez! Did I just hear a chainsaw?

#8. Where did I go wrong? 60 kids and they are all a bunch of fat, lazy grubs.

#7. Man, she's got some nice declivity going on!

#6. Why am I always on top?

#5. If CBC does another story on how destructive we are, I am gonna puke! What about the blue stain fungus?

#4. There's that *Ips* family that just moved in... there goes the neighborhood!

#3. I wish the government would do something to control those woodpeckers.

#2. I wonder what's on TSN tonight?

And the #1 thought of a male mountain pine beetle... These Alberta winters are too long... I need a vacation!

*Mike Maximchuk*

## Pesticides - be careful how you use them

Now that temperatures are starting to rise and the snow is disappearing, we can start to believe that spring is finally here. Spring brings the promises of a new growing season. Soon, emerging greenery will begin to flush all around. Accompanying this, no doubt, will be a host of insects whose purpose in life will (apparently) be to eat as much of the succulent new growth as they can. When their ravenous feeding (and subsequent damage to plants) interferes with human wants and/or needs, people will often use pesticides to control the insect pests. Pesticides can be an effective tool for pest management. However, they can have unintended consequences and should be used judiciously.

A cautionary tale of pesticide use occurred in the early 1950's in Borneo. There, the Dayak people had been suffering through a terrible outbreak of malaria. The World Health Organization (WHO) decided to spray large amounts of DDT, from aircraft, to control mosquitoes responsible for carrying the disease. This action did indeed reduce the cases of malaria. However, a short time later, the thatch huts – in which the Dayak lived – began collapsing. Apparently, the DDT had also killed parasitic wasps that had previously kept thatch eating caterpillars in check. To make matters worse – poisoned insects were ingested by lizards, which were in turn ingested by cats, and the cat population plummeted. This resulted in an increase in the population of rats. So, not only were the Dayak homeless, they were

also at increased risk of rat borne diseases like typhus or sylvatic plague. Eventually, the WHO had to respond to the problem. They decided (and this is true) to parachute cats into the affected area.\* One wonders how they got the cats to jump, and if they all landed on their feet.

So, later this spring if you feel you have a need to employ a pesticide to control a defoliator pest, think of the plight of the poor Dayak. Get as much information as you can to avoid unexpected repercussions. Find out something about the insect pest and which pesticide is appropriate for use against it. Find the appropriate rates and methods of application. Determine the optimal timing for application (e.g. times when the pests natural enemies will be least affected). Finally, ask yourself "is the use of pesticides justified?" Alternative and effective control measures may be available.

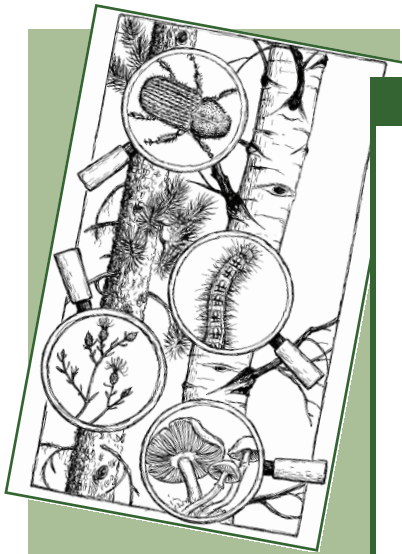
The story outlined in this article may be a bit extreme, but it does illustrate the interconnectedness of things in nature. Pesticides can indeed be an effective tool in pest management, but be aware of unintended consequences, the next "Cat Drop" may be coming to a neighborhood near you.

\*Depending upon the source, the number of cats used in "Operation Cat Drop" ranged from upwards of 20 to 14000.

*Tom Hutchison*







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current forest health issues.

Articles are welcome.

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Resource Development

## Whitebark pine rumination

*Pinus albicaulis,*

Perched on the crown of a continent.

Songs of a distant Nuthatch,

Carried on sub-alpine breeze,

Waft casually through your boughs.

What for you does this portend?

A new beginning?

Ghost Forest?

As a new century starts.

You hang over a precipice.

White bark glistening,

In the warm fall sun.

*Tom (Kerouac) Hutchison*

