

# Bugs & Diseases

20<sup>th</sup> Anniversary Edition

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## Old tablet goes from zero to hero in the Weed Program

Last spring Aaron McGill decided to write a weed application for two tablets that were retired from mountain pine beetle (MPB) surveys. He sent these to Caroline Charbonneau in Hinton and myself to field test in the summer. Equipped with a Bluetooth GPS, the tablet displays the users' current location with the satellite imagery in the background. Infestations are drawn on the screen with a pen, and then a menu appears with fields and drop-downs to enter data for each site. After my first day in the field with it, I asked Aaron if he could add some fields to the data menu. So, during the entire season all of my weed survey and control information was recorded on the tablet. On only two occasions was I not able to get a satellite signal.

Normally all of the weed survey and control data are collected on paper, GPS and iPAQ; then, at the end of the season, I draw all of the line and polygon features in ArcMap and populate the data tables – a long and tedious chore. This year I cop-

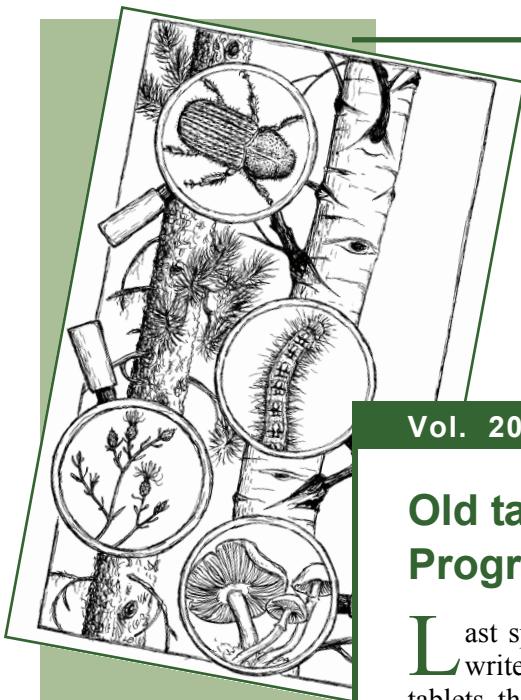
ied the shapefiles from the tablet to my computer with a memory stick and loaded them in ArcMap – Done! And the size and location of weed infestations can be tracked easily and more accurately.

While in the field I was able to note in the comments field if a weed site was on a disposition. Now that the Digital Integrated Dispositions (DIDs) information layer is complete for the Clearwater Area, it is easy to identify the responsible leaseholders. This information can be used to plan co-operative spray projects and also be passed to Lands Management Branch so that disposition holders are notified that they have outstanding weed issues.

I would like to add a few refinements to the data menu this winter, but I love, love, love the tablet for use in the weed program. I plan to also incorporate digital data collection into the weed contract next year.

Thanks Aaron!!

*Marian Jones - Clearwater*



### Alberta's eye on forest health

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## Orange Hawkweed infestation discovered in the Waterways and Lac La Biche Area

For the first time ever, Orange Hawkweed (*Hieracium aurantiacum*) was noted in SRD's County of Athabasca in 2009. This likely was the first recording of this species anywhere within the entire Waterways/Lac La Biche Area as well. Ron Jackson (Director of Agriculture and Emergency Services, County of Athabasca) provided the following outline of the discovery and subsequent treatment of the infestation:

"The initial discovery of Orange Hawkweed on the Ghost Lake area ball diamond at NW15 68 24 W4 was made by a couple of (County) Councillors who were traveling in the area on other County business. They noticed the weed in flower which caught their attention because of its uniqueness and they brought it into the Agriculture Service Department office for identification. When it was discovered that the plant in question was Orange Hawkweed, Weed Inspector Trent Keller made a trip out to see the site and assessed the situation. While at the site contact was also made with the person in charge of the property. Mr. Keller advised him of the urgency to control the problem and what herbicide we would like to use, what he could expect for residual activity, and the products performance. We agreed to carry on with the spraying and made it a priority."

The County sprayed the site on the 23rd of July 2009 using the herbicide Tordon 22k and made a follow-up trip to the site to check the efficacy of the

treatment, and to look for possible missed spots. They have made a note to revisit the site in the spring of 2010 to evaluate the treatment and decide if future action is required.

Various parts of Alberta are recognizing that Orange Hawkweed is an invasive species that must be taken seriously. For example, Parkland County has elevated this species Weed Designation to noxious. In the Summer 2008 (Vol. 2 No. 2) issue of the Alberta Invasive Plants Council newsletter, then coordinator Vanessa Carney wrote: "The invasive potential for this introduced ornamental is great, as it hybridizes freely with native hawkweeds, spreads easily via seed and vegetative means, and out-competes and inhibits the growth of native vegetation."

The Eastern Forest Threat Center website (<http://www.threatsummary.foresthreats.org/threats/threatSummaryViewer.cfm?threatID=269>) states "Orange hawkweed prefers full sun or partial shade and well drained, coarse-textured soils. It invades urban sites, moist meadows, pasture, hay fields, roadsides, gravel pits, forested areas, tree plantations, and riparian areas. It forms extensive mats that can aggressively compete with forest understory plants for space, light, and soil nutrients. It has been reported to produce phytotoxic chemicals in pollen grains that inhibit seed germination, seedling emergence, or regeneration of other plants."



Orange Hawkweed Infestation Northeast of Athabasca - July 17, 2009

Because of its aggressive nature, its ability to establish itself in a wide range of ecosystems, and its tendency to hybridize with native species of hawkweed, we must be particularly diligent in not allowing this species (an escaped Eurasian ornamental) to become established in the Waterways and Lac La Biche Area. We already have a number of other escaped ornamentals raising havoc with our native ecosystems, creating problems for land management, and causing unnecessary expenditures – we sure don't need any more!

*Marty Robillard - Athabasca*



After Spraying – August 11, 2009

## 13th Provincial Integrated Forest Pest Management Forum

This annual Forest Pest Management Forum organized by Alberta Sustainable Resource Development provides a venue for those who have an interest in forest health in Alberta to gather for an update on current conditions and ongoing research. The 13<sup>th</sup> forum was held on November 18<sup>th</sup> at the Pine Room, Northern Forestry Centre in Edmonton, provided gratis by Natural Resources Canada. In spite of tough economic times that have resulted in travel restrictions, nearly 60 persons attended this forum. They represented forest industry, academic institutions, forest health research community and all three levels of government.

The proceedings included updates on major forest health damaging agents on provincial Crown land and National Parks; presentations on current research on the mountain pine beetle and defoliators; genomics; invasive and exotic pests and young stand pests. Forest industry folks shared their views on forest pest management. Dr. Brian Aukema, a Research Scientist affiliated with the Pacific Forestry Centre and the University of Northern British Columbia, was the keynote speaker. His presentation on “Interactions between above- and below-ground disturbance agents” that explored the interaction between the mountain pine beetle and Warren's root collar weevil was well received.

This forum is open to anyone with an interest on Forest Health issues in Alberta. If you would like to place your name on the mailing list for this forum please contact Lisa Jean at [Lisa.Jean@gov.ab.ca](mailto:Lisa.Jean@gov.ab.ca)

The proceedings of the 13th forum are posted on the FTP Site: [ftp://ftp.env.gov.ab.ca/pub/out\\_going/forest\\_health/IFPM/](ftp://ftp.env.gov.ab.ca/pub/out_going/forest_health/IFPM/)

*Sunil Ranasinghe—Edmonton*

## Drought stress and Mountain Pine Beetle - A difficult combination for some Alberta pine stands

For many parts of Alberta, 2009 was a very dry year. Evidence of widespread drought conditions is abundant. In June, as the result of an unusually dry spring, the County of Camrose declared a state of agricultural disaster. The headline for Andrea Sand's August 9 *Edmonton Sun* article proclaimed: "Alberta drought worst since 1930s." The article chronicled the hardship faced by cattle farmers in northwestern Alberta. According to Agriculture and Agri-food Canada's National Agroclimate Information Service, precipitation compared to normal distribution was very low to extremely low (and some areas had record dry levels) over much of central and northern parts of the province from the start of April to the end of August. Finally, as stated in Sustainable Resource Development's Forest Protection website, moisture levels in Alberta's forests were significantly low heading into the winter season.

Given the above, it is very likely that many of the province's forested areas are stressed. Water is a critical limiting resource for all plants. Reduced soil moisture content causes a number of physiological responses in trees. These include things like reduced resin production and initiation foliage, branch, and root senescence (setting up abscission and compartment lines, cutting off resources to tissues, allowing some tissues to die). Some of the more obvious, above-ground, symptoms of drought stress can be seen in the foliage of deciduous and conifer trees. For conifers, drought stress can cause foliage to develop a yellowish (or chlorotic) appearance.

In terms of Mountain Pine Beetle (MPB) management, the effects of drought stress can be significant,

affecting both the beetle's ability to infest trees and our efforts to detect these infestations. Drought-stressed pine are more susceptible to successful attack by mountain pine beetle, partly because the trees are unable to produce enough resin as a defensive response. Often these trees will not display the "pitch tubes" characteristic of MPB attack, making detection more difficult, and infested trees may be missed during ground surveys. Conversely, chlorotic foliage in trees suffering from drought can look similar to trees that have been attacked by MPB, which can cause "false positive" identification during aerial surveys.

Interestingly, in some areas this year MPB-attacked trees turned colour in the same season as the attack occurred. Could this phenomenon have been due (at least in part) to drought stress – who knows? However, it has provided an unusual opportunity to detect new MPB infestations this year instead of having to wait until next year. If this can be attributed to lack of moisture, then perhaps this can be one positive arising from dry conditions in 2009.

In general, drought stress is not good for trees -- it affects photosynthesis, inhibiting growth and increasing susceptibility to insects and pathogenic diseases. Add an expanding MPB population and it could be interesting times for pine stands in drought-affected areas. For their good, and for the good of other forested areas, one should hope for "well timed" and adequate precipitation. So remember, though April showers may come your way... it's better than the alternative, any day!

*Tom Hutchison - Athabasca*



Fading green attack south of  
High Prairie

Photos - Dale Thomas 2009



## Changing Climate - Changing Forests

Recently, I returned from vacation in Hawaii. I thought "now here is a climate change!" I am able to survive this frigid land, but if I were a Hawaiian tree transplanted to Alberta in winter, there is a pretty good chance I wouldn't make it through a day. This is a result of one significant advantage we humans have over trees: our ability to quickly adapt to adverse conditions. I can put on a coat and hat at the airport to prevent frostbite, but the poor tree would require thousands of years for slow and small generational adaptations to even attempt to withstand the cold.

Thankfully, climate change experts don't predict dramatic temperature swings such as described above. But even small temperature or other climatic changes can significantly impact forests. Alberta Environment's 2005 climate model predicts that our province's mean annual temperature may increase 3-5°C by the 2050s. Based on this and other weather scenarios for Alberta, it is expected that climate variability and risk of extreme disturbance events, particularly drought, will be the most important threats imposed on forest ecosystems in Alberta. This will influence the health, productivity and distribution of our forest tree species.

Many of the important commercial species in Alberta are expected to lose a portion of their currently suitable habitat over time. This would likely be preceded by reduced growth, productivity and declining health. These changes are not only a direct result of climate affecting the tree, but also climate affecting an insect's or disease's ability to cause damage to that tree. Interactions in this pest-host-climate triangle are numerous and complex,

and are of a particular interest to SRD's forest health program.

Part of the SRD Forest Health program's long-term plan is to develop a comprehensive monitoring system to detect and quantify climate-induced forest impacts. To start, we are currently cooperating with Canadian Forest Service researchers to continue to monitor 54 plots in Alberta to study climate impacts on the health and productivity of aspen. It is hoped that this type of study can be implemented for other important tree species in Alberta.

*"...it is expected that climate variability and risk of extreme disturbance events, particularly drought, will be the most important threats imposed on forest ecosystems in Alberta."*

When forest sustainability is the goal, detecting the changes in forest health is the first step; the second is to use the information to adapt management practices. Tactics such as assisted migrations of tree species are being explored to do just that. As previously mentioned, the distribution of some commercial species is predicted to decline. If so, what will take its place? It is hypothesized, for example, that suitable habitat for Douglas fir and ponderosa pine could extend westward and north in Alberta. With time we may have to consider changing our province's tree emblem from lodgepole pine to something a bit more exotic.

For more information on the predicted implications of climate change on forests, see Climate Change and Alberta's Forests:

[http://www.library.for.gov.bc.ca/ipac20/ipac.jsp?session=1R567L04P5455.39367&profile=mof&uindex=B A W & t e r m = C e r e z k e , % 2 0 H . % 2 0 F . & aspect=basic\\_search&menu=search&source=~!forest#focus](http://www.library.for.gov.bc.ca/ipac20/ipac.jsp?session=1R567L04P5455.39367&profile=mof&uindex=B A W & t e r m = C e r e z k e , % 2 0 H . % 2 0 F . & aspect=basic_search&menu=search&source=~!forest#focus)

*Mike Undershultz - Edmonton*

## 2009 Golden Beetle Award

The Forest Health Section has started a “Golden Beetle Award” to recognize outstanding contributions to our program. This is the first year of the award and Brooks Horne, the Forest Health Officer from the Foothills Forest Area is the deserving winner.

Brooks is one of the leaders of the Forest Health Section who constantly brings fresh ideas to the table and adapts the program to what he is observing in the field. As we all know, the forest health program rapidly changes each year and Brooks has the ability to adapt his program quickly to what he sees in the field. Plus, Brooks is a real nice guy.

Congratulations Brooks!

*Daniel Lux—Edmonton*



## Really Low! Really Low! Really Low!

Sung to the tune of “Let It Snow! Let It Snow! Let It Snow!”  
(<http://www.christmas-carols.net/carols/let-it-snow.html>)

Oh the climate it seems is warming,  
Pine beetles keep on swarming.  
If this trend becomes status quo,  
Eastward ho! They will go, don't you know!

It doesn't show signs of stopping,  
So trees we'll keep on lopping.  
And the spread, perhaps we can slow  
Make it slow! Make it so! Perhaps so!

If we finally get some cold,  
We might actually catch a break.  
We need winter to take a hold,  
And start freezing for goodness sake.

Control, we'll try our best at,  
And remove some beetle habitat.  
Till the temperatures get real low,  
Really low! Really low! Really low!

*Tom Hutchison — Athabasca*

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