

WYO-BIO

Biocontrol News and Views for Wyoming

Editor's Update: the Latest From UW

The goal of WYO-BIO is to update people interested in biocontrol in Wyoming on some of the latest developments in the state. In this edition, you'll find some articles on the latest on the biological control of three weeds: diffuse, spotted, and Russian knapweeds. A second goal of mine in WYO-BIO is to include some editorial-like articles that make suggestions about management tools that could come in handy for some readers. Along these lines, Jim Gores from Teton County Weed and Pest has written a great article about mapping weeds and why you should do it.

I'd also like to use WYO-BIO to briefly mention some of the things that I have been up to here at UW. The following is my personal update. First, I was quite happy to have successfully gone through the reappointment



process, which means I still have a job next year. I got good feedback from the University, and thank the people who put in good words for me with the Dean and faculty. Second, I have made some progress in settling in on research projects. I am currently preparing a work plan, which I will discuss at the spring workshop. Finally, Brian Connelly from Natrona County and I have been discussing putting together a 'Handbook of Weed Biological Control in Wyoming'. Some progress has been made and I'll have more time this spring to work on it further. I hope you find this issue of WYO-BIO interesting and informative. Have a great spring.

Tim Collier



Editor's Note:

In the last issue of WYO-BIO, the credit line was inadvertently left off of this nice photo of *Mecinus janthinus*. Thank you Noah Poritz for the use of this photo. We apologize for the oversight.

INSIDE WYO-BIO

Mapping the Weeds of the Past, Present and Future	2
Update on Russian Knapweed Biological Control	3
Release of New Knapweed Agent	4

Mapping the Weeds of the Past, Present and Future

by: Jim Gores, Teton County Weed & Pest

So you've been hearing that you need to get your weeds mapped. Everybody is talking about it. But you know where your weed problems are and so why should you take money away from weed control to pay for some pretty maps with dots on them that you already know exist?

The answer is two fold – continuity and accountability. As we all know, change is inevitable. People move on or pass away. Knowledge leaves with an individual, while data remains. Mapping weeds not only provides a baseline for future weed data collection and management, but it also provides a common knowledge base that is available to all employees – both present and future. Since I have been at Teton County Weed & Pest for 3 years, I know where many of the weed problems are, however, I don't know where they may have been in the past. This past summer, I happened to find an old journal from a spray crew from 1997. In it were a set of coordinates for a patch of leafy spurge that I had never heard about. The spray crew members had long since moved on and no one else knew about the patch or if it had been eradicated. Therefore, I plugged

the coordinates into my GPS and headed for the site. I searched the area thoroughly, but did not find any leafy spurge. Some of you may say 'See, what good did it do?' This brings me to my second story. One of my forest service contacts told me about a patch of Russian knapweed that had been sprayed 3-4 years ago in the Snake River Canyon. They were pretty sure that they had eradicated it, but had never checked back on it. With some very interesting directions, I found my way to the old site. Sure enough there was a small bunch of Russian knapweed plants growing out of the hillside and doing quite well.

In the first story, no plants were found. However, even though no one was still working at TCWP with knowledge of the patch, I was able to verify that no new leafy spurge plants sprouted up. In the second story, if my Forest Service contact had left without passing along his knowledge, there would probably be a healthy, expanding patch of Russian knapweed on the hillside. Both sites are now in our database, because as we all know, you haven't eradicated a weed infestation until all of the roots and seeds are dead and gone. And now because of the maps we made, anyone can learn that Russian knapweed and leafy spurge once infested those areas and can continue to check on these sites until we are sure that they are weed free.

As I stated earlier, accountability is the second argument for mapping your weeds. We all know that we are working hard to reduce our weed problems, but can you prove that you are actually reducing your weed infestations? Photographs can help on a site-by-site basis, but they don't provide a good overall perspective. More and more, we are asked to produce tangible AND documented results. Arguably this takes time away from more important work, however now and in the very near future we may need documented results to defend or support our budgets, jobs and practices. Mapping your weeds will provide a baseline from which you can support your program and its objectives to those who do not understand the work we do.

We've all heard how weed mapping can increase efficiency and simplify certain tasks. These benefits are very important and handy, but in this day and age where employees no longer stay with a company for 20 or 30 years and the word 'lawsuit' is tossed out as freely as the morning garbage, weed mapping could come to play an even more important role in our future. And if nothing else, it may eventually stand as a legacy to how effective your weed control program truly was.

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ABOUT WYO-BIO

*Editor: Timothy Collier
Dept. of Renewable Resources
University of Wyoming*

*Design & layout by The Letter Works
newman@netcommander.com*

*Send address changes to:
WYO-BIO
Attn: Deidre Newman
P O Box 1243
Torrington, WY 82240*

Published three times yearly, *WYO-BIO* is intended to keep individuals concerned with weed control in Wyoming informed about the latest in biological control news. Free to interested parties, *WYO-BIO* includes upcoming insect collection dates, the latest finds in biological control research, and other news as it relates to biological control in Wyoming.

WYO-BIO is a joint effort of the Wyoming Biological Control Steering Committee, the University of Wyoming Department of Renewable Resources, and the Wyoming Cooperative Agricultural Pest Survey (CAP) program.

Suggestions on content and submissions for features are welcome at the above addresses.

An Update on Russian Knapweed Biological Control

by: *Tim Collier and Urs Schaffner*

As many of you know first-hand, Russian knapweed is one of our most problematic weeds in Wyoming. Although biological control has gotten off to a less-than-spectacular start with the imported nematode, efforts at biological control of this weed are continuing. Jeff Littlefield from Montana State University has been investigating at least five new agents, and the Centre for Agriculture and Biosciences International (CABI) in Switzerland has been investigating four others. This article summarizes some of CABI's most recent research results. The following may seem to be some twisted line-up of wannabe superheroes. Hopefully one or more of these insects will be superheroes in Russian knapweed control in the future.

The Gall Wasp.

Host specificity testing is furthest along for *Aulacidea acroptilonica*, a wasp that produces galls on the stem of the Russian knapweed plant. Initial testing suggested that this species develops on a native knapweed species, *Centaurea americana*, as well as Russian knapweed. Further tests indicate that this result may have been a rare event. No galls could be produced on *C. americana* last summer. More tests are needed both with *Centaurea americana* and another native species, *Centaurea rothrockii*. The TAG committee has also requested information both from the laboratory and the field that might be used to predict the impact of this agent on all three knapweed species.

The Root-Feeding Moth.

A second species that has been fairly well studied by CABI is a root-feeding moth, *Cochlimorpha nomadana*. This insect has shown a fairly broad larval host range, meaning that it will feed on plants that are outside the two genera containing the knapweeds. Female moths probably lay eggs on a narrower range of host plants than the larvae can feed on, so CABI has begun to investigate adult female behavior. These behavioral observations are challenging because the experiments must be done under open-field conditions in Uzbekistan, at night, when the

weather is just right for female moths. A narrow egg-laying host range must be demonstrated if importation of this species is to be petitioned with TAG.

The Root-and-Shoot-Destroying Fly.

A third potential agent for biological control of Russian knapweed is a fly that feeds as a larva on the shoots and root crowns of the plant. This fly has not yet been named to the species level but is known to be in the genus *Napomyza*. Host specificity of this insect was studied further last summer at CABI. *Napomyza* has developed successfully on the two native knapweeds but not a variety of other plant species. TAG petitions for this species will probably wait for results of the petition for *Aulacidea*, which is more host-specific and so more likely to be approved.

The Gall Midge.

The fourth potential agent for biological control of Russian knapweed is a midge species in the genus *Dasyneura*, which produces galls on the tips of the knapweed shoots. The developing galls prevent the shoot from growing further and from flowering as well. Host testing suggests excellent specificity. This species developed only on Russian knapweed and cornflower (another Eurasian species). It failed to develop on the two native knapweed species. Because of its specificity and potential impact, *Dasyneura* may one day be an excellent agent for importation against Russian knapweed in North America.

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Releases of a New Knapweed Agent in Wyoming

by: *Tim Collier, Univ. of Wyoming*

The latest development in the biological control of spotted and diffuse knapweed is the release of a seed-head feeding weevil, *Bangasternus fausti*, from eastern Europe. Although first released in Sheridan County in 1995, efforts have been stepped in 2001 and 2002, with new releases by USDA APHIS of the beetle in Natrona, Johnson and Carbon counties. Adult *Bangasternus* are brown and about a third of an inch long. The larval and pupal stages, which occur in the knapweed seed heads, are white and about the same size as the adults or less. This species emerges as an adult in May-June. Adult females feed on knapweed foliage, mate and lay eggs on leaves and flower heads from June to mid-August. In Europe, this species often consumes 100% of the knapweed seeds in a flower head. *Bangasternus* prefers diffuse knapweed, but will also feed on spotted knapweed and a few other noxious knapweed species (meadow, brown and squarrose knapweed). It is hoped that *Bangasternus* will further reduce diffuse and spotted knapweed seed production in Wyoming, and ultimately contribute to the decline of these troublesome weeds in our state.

Deadline for WYO-BIO Summer 2003

Individuals interested in submitting material for the summer 2003 edition of WYO-BIO should have their material to our office by June 1, 2003.

Photos, articles and letters to the editor are all appropriate for submission. Addresses for submission can be found in the "About WYO-BIO" sidebar.



P O Box 1243
Torrington, WY 82240

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