



## Intermountain and Northern Regions State & Private Forestry Briefing Paper

-- March 2009 --

### Topic: **Biological Control of Tansy Ragwort by the Cinnabar Moth on Flathead & Kootenai National Forests in Montana**

**Summary:** First found in Oregon in 1922, tansy began threatening the costal livestock industry in the 1970's. Following a fire in 1994 in Montana, tansy overwhelmed the native vegetation in the burned area creating a dominant monoculture of this invasive weed.

In 1997, Forest Health Protection (FHP), Rocky Mountain Research Station (RMRS) and land managers obtained biocontrol agents for tansy from Oregon and are collaborating to improve biocontrol effectiveness in Montana.



Adult Cinnabar moth & Larvae of Cinnabar moth

**Accomplishments** of this joint FHP-Research effort include:

- 1) Long-term weed control in meadows and forested lands, and
- 2) Partnerships developed with FHP, RMRS and land managers.



**Challenges** remain, including:

- 1) Improving effectiveness of biocontrol in Montana's riparian areas where the moth has performed poorly,
- 2) Redistributing and monitoring new biocontrol agents in new weed infestations, and
- 3) Increasing capacity to address recent fires that have created new areas for weed invasion.

### Background

Native to Western Europe, tansy ragwort, *Senecio jacobaea*, was first reported in the Pacific Northwest in 1922 where it invades meadows and open forest and forms monocultures that replace agricultural and native plants. It is highly poisonous to livestock. Annual losses of 5-10% of cattle herds were not uncommon during the 1970's, forcing some dairies out of business.



Initial releases were in field cages

Introduced into the northern Rocky Mountains of northwestern Montana before 1990, tansy was overlooked until it overwhelmed the burned area from a 1994 wildfire. Initially thought to cover only a few hundred acres, subsequent surveys revealed this infestation densely covered several thousand acres. Numerous isolated plants and small patches were found up to 25 miles away.

Post-fire weed management efforts began in 1997 initially centered on the use of herbicides, but also included releasing the Cinnabar moth as biological control (biocontrol) agent. FHP and RMRS initiated a field cage study to verify that native *Senecio* species were not threatened by this biocontrol agent.

In 1999, the cages were removed and the moths dispersed naturally to nearby weeds. In subsequent years, FHP, RMRS and land managers initiated a program to facilitate the distribution of these moths throughout the rest of the burned area infested with tansy.

## Project Highlights

- ◆ FHP and FS personnel made 17 biocontrol releases of which 15 had immediate establishment in the Flathead NF portion of the burned area. The moths then rapidly dispersed throughout the surrounding area.

- ◆ On the Kootenai NF portion of the burned area, FHP and FS personnel continued to make more releases in 2000 and 2004. These moth populations also quickly established and are rapidly expanding throughout the weed infested area.

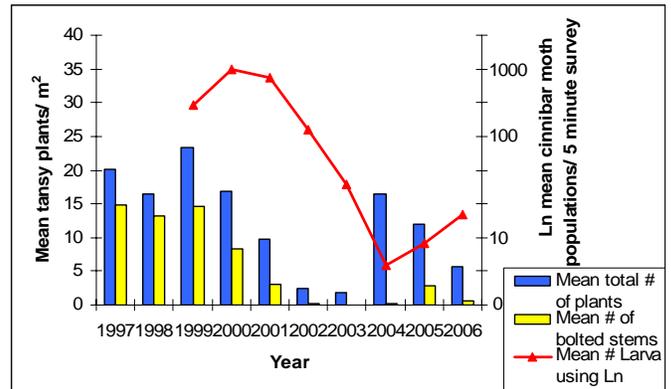


Tansy 1999, before



Same location 2008

- ◆ RMRS and FHP staff with help from NFS personnel monitored the change in tansy infestation and moth populations after biocontrol release on the Flathead National Forest. The tansy density remained constant for the first three to four years while the moth population built up. Then, the tansy began to decline and reached a low in 2003 when it was almost undetectable. The moth population then collapsed from a lack of food. By 2004 the tansy began to reinfest the study sites, but these were new seedlings or very small rosettes. Consequently, moth populations also rebounded with this new food source and has again begun to suppress this weed.
- ◆ This program's biggest success is the almost total visual disappearance of flowering weeds since 2002 in the older Flathead NF infestation. We are predicting the Cinnabar moth will eventually control the tansy over 80% of any future infestations found in Montana.



## Future Direction and Challenges

- ◆ The Cinnabar moth does not seem to be adapted to all microclimates; repeated failures to establish at cooler, moister sites along some valley bottoms have been disappointing.
- ◆ FHP and FS personnel are presently distributing a cold-hardy strain of the second biocontrol agent, tansy flea beetle. The adult beetles feed on the leaves and the larvae attack the roots. Early work indicates that this insect is ideally suited to these cool microhabitats, but limited funding has prevented any large scale redistribution efforts.
- ◆ In 2007 a major wildfire swept through 50,000 acres of national forest lands immediately to the north of the tansy infestation. This created ideal habitat for a new major tansy infestation. Therefore, FHP and RMRS are working closely with land managers to integrate biocontrol into their post-fire rehabilitation program.



Tansy flea beetle



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RMRS



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