

# A Biological Control Program for Common Tansy (*Tanacetum vulgare*) in Canada and the United States

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## Common tansy – the target

- A perennial in the family Asteraceae, native to Europe, introduced as a culinary and medicinal herb, and escaped over 200 years ago.
- Forms dense stands in pastures, roadsides, waste places, and riparian areas across Canada and the northern USA, and is also spreading in forested areas.
- Contains several toxic compounds, such as  $\alpha$ -thujone.
- Reduces the productivity of pastures, displaces native vegetation, and can hinder forest restoration efforts.
- Listed as a noxious weed in several states and provinces.
- Considered a good target for biological control, as it is a perennial plant growing in stable habitats, has a large herbivore fauna in its native range, and has few native North American close relatives.



Tansy in a riparian area in Alberta ...



... in a pasture in Minnesota ...



... in a clearcut in Minnesota.

## Participants in the program

- A Canadian-US consortium led by the Alberta Invasive Plants Council (AIPC) and the Minnesota Department of Agriculture.
- McClay Ecoscience coordinates the project in Canada on behalf of the AIPC.
- CABI Europe-Switzerland identifies and tests potential agents for efficacy and host specificity.
- USDA-ARS Northern Plains Agricultural Research Laboratory is carrying out phylogenetic studies on *Tanacetum*.

## Test plants for host-specificity studies

A test plant list has been submitted for review to the Canadian Biological Control Review Committee and the US Technical Advisory Group. *Tanacetum vulgare* is a member of the tribe Anthemideae, which has about 115 native species and subspecies in North America. Three or four native *Tanacetum* species have sometimes been recognized, but all are currently synonymized under *T. bipinnatum*. Molecular studies are under way to clarify their relationships and taxonomic status.



Test plants being grown at CABI

## Foreign exploration

Eleven potential biological control agents were identified from field and literature surveys in Europe in the mid 1990s and a more recent literature survey covering Russia. During 2006 and 2007, several of these species were collected at field sites in northern Germany and Russia (near St. Petersburg), and biological and host-specificity studies have been started.



Field collection site near Kiel, Germany

## Variation within common tansy

*T. vulgare* is a highly chemically variable species. A doctoral student at the University of Bielefeld, Vera Wolf, will study the effects of chemotypes on host-plant recognition by some candidate agents. In collaboration with Dr. Alan Smith (University of Minnesota) we also plan to try to match chemotypes and genotypes of introduced and European populations of *T. vulgare*.

## Candidate agents and their current status



The beetle *Cassida stigmatica* feeds on tansy foliage in the adult and larval stages, but can develop on the native North American *T. bipinnatum*. Choice tests in 2008 will assess the potential impacts on this species.

The stem-mining weevil *Microplontus millefolii* has been collected as larvae in northern Germany and Russia. We plan to collect adults for preliminary host-range tests in spring 2008.



The shoot-boring long-horned beetle *Phytoecia nigricornis* has been collected at several sites in Germany, mostly in the larval stage. We plan to collect adults in spring 2008 for preliminary host range studies.

The moth *Isophrictis striatella* is common in northern Germany. Adults emerge in August and oviposit on or around the flower heads, and larvae mine the flower heads, shoots and rhizomes. Host-specificity testing will start in 2008.



Twelve species of *Dichrorampha* moths are recorded mining stems and roots of tansy. However all species reared out so far have been polyphagous.

A gall midge, possibly *Ozihincus tanaceti*, develops internally in the seeds.



Another gall midge, *Rhopalomyia tanaceticola*, galls the stems, leaves, and flower heads.

A flea beetle, *Longitarsus noricus*, was common at the Russian sites in 2007. Its life history is being studied. Species in this genus are usually root-feeders as larvae, and some have been successful as biocontrol agents against other weeds.



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