Biological Control of Weeds

How Bio-Control Works for You

- **Low-Cost Weed Control.** Bio-control is considered by many to be the most cost-effective weed management method available.
- **Permanent Weed Control.** Once established and feeding in your weed infestation, your insects will continue to attack year after year. No other weed management method provides you with a long lasting control.
- **Effective Weed Control.** All the insects offered have proven scientific record in attacking and feeding upon their target weeds.
- **Environmentally Friendly Weed Control.** Only the target weed is attacked – non-target trees, shrubs, grasses and crops are unaffected; safe for use along shelterbelts and waterways.
- **Integrated Weed Control.** Using bio-control insects is easy – just release each carton into specific areas where you want them to go to work. You can continue to use herbicides if you desire. Just limit the chemical treatments around the insect release sites for the first few years.

Canada Thistle Insects

Thistle Stem Weevil

There are two insects that are most effective against Canada Thistle. One is *Ceutorhynchus Litura*, the **Thistle Stem Weevil**. This cold hardy weevil attacks the young thistle plants as they sprout from the soil in early spring. The developing "litura" larvae internally mine the stem of the thistle plant as the shoot elongates during the summer. Fully developed larvae will exit the thistle at the root crown causing a multiple exit holes. Larvae will pupate in the soil and emerge as adults later the in the summer. Adults will over winter in the soil, ready to attack the emerging Canada Thistle the following spring.

Thistle Gall Fly female and stem galls

Thistle Stem Gall Fly, *Urophora Cardui*, attacks the primary and lateral stems of Canada Thistle. Adults will lay eggs on the thistle plant in the early summer when plants are bolting. The developing larvae stimulate the plant to form a hard, woody, stem gall. Galling directs nutrients away from the plant's normal metabolic and reproductive functions. Abnormally developed flower heads frequently occur above the gall, often reducing seed production. Multiple galls are possible on a sing Canada Thistle plant.

Knapweed Insects

Two insects are winning the war on knapweed. One is the **Blunt Knapweed Flower Weevil**, *Larinus Obtusus*. This cold hardy beetle lays its eggs throughout the summer on the flowers of spotted (and diffuse) knapweed. This insect is becoming an important agent in reducing the production of new knapweed seed. The weevil is suited to most spotted knapweed infested areas.

Knapweed Flower Weevils

The second important insect is the **Knapweed Root Weevil,** *Cyphocleonus Achates*. The large weevil lays approximately 100 eggs at the base of spotted and diffuse knapweed plants. The developing larae mine the central tap root, damaging the weed's vascular tissue and cause rootgall formation. This root-boring beetle is demonstrating dramatic impact.

Knapweed Root Weevil