Biocontrols for Russian Thistle

The Russian Thistle casebearer moth mines out the insides of leaves during its first two larval stages. Later as a casebearer, it feeds externally on the leaves. Cases are made from a hollowed-out leaf, and only the head and forelegs protrude outside the case. The casebearing larvae move from leaf to leaf and to other plants, each eating 15 to 24 leaves during its development.

Prepared by the Lincoln County Noxious Weed Control Board

Truly A Nuisance!

Although not a noxious weed, **Russian Thistle** is ***truly a nuisance!***

Plants may be as small as a soccer ball or as large as a **Volkswagen beetle.** The plants litter and fill roadsides, waste places and undeveloped areas. It blows against fences, blocks waterways, and may cause accidents on highways. It favors disturbed sites. With its prodigious seed production, flammability, wind-driven tumbling, and thorny stems, it soon becomes a pest.

Russian Thistle is encroaching onto dirt roads near **Seven Bays** making passage in an automobile nearly impossible.

Tumbleweed may be an icon of the American West, but it is a traffic hazard on local highways. It scratches cars, whether parked or moving.

Tumbleweed is highly flammable! Landowners near **Lincoln County's Wall Lake** fear another range fire where tumbling balls of fire roll in and engulf their homes into flames.

At the east end of **Harrington, tumbleweed** from **CRP** fields stacked up five feet tall along a windbreak of trees after a windstorm. Homeowners spent a weekend disposing of the tumbleweed to avoid a signficant fire threat.

Russian Thistle at maturity

Russian Thistle in bloom

Tumbleweed, Russian Thistle, up against a barbed-wire fence

Biology of Russian Thistle

- A rounded, bushy, much-branched **annual broadleaf,** normally **1/2 to 3 feet tall, reproduced by seed.**
- **Leaves** are **alternate,** the first are long, string-like and soft, with later leaves short, scale-like and tipped with a stiff spine.
- **Stems** are usually **red** or **purple striped.**
- **Seeds** are spread as **mature plants break off at ground level** and are **scattered by the wind** as **tumbleweeds.**
- **Rapid germination and seedling** is established **after only brief and limited amounts of precipitation.**
- Since introduced **from Russia in the 1800s,** it has become a nuisance.

Larval cases on Russian Thistle

Larval cases on Russian Thistle

Control Options for Russian Thistle

- **Use an integrated approach to control this nuisance weed: spray or prevent the weed from seeding in accessible areas and use biocontrols where spraying herbicides or other control methods are too costly.**
- **Don't use biological controls for small patches, especially if it can easily be sprayed or cultivated.**
- **As an annual, prevent the weed from going to seed by: mowing, pulling, hoeing, cultivating, brush-hogging or burning, before it goes to bloom. Properly dispose of the old plants.**
- **Spray herbicides according to the label directions.**
- **Weedmaster, 2,4-D, Tordon, Escort, Telar, Milestone and Cimarron Max are some recommended herbicides. Always use a surfactant when spraying these weeds.**
- **Release biocontrol insects on hillsides, very large patches, forested areas, and other inaccessible areas.**

Larval cases on Russian Thistle

Lincoln County Noxious Weed Control Board
405 Ross Street, P.O. Box 241
Davenport, Wash. 99122

How Effective Are Biocontrols?

Lincoln County Noxious Weed Control Board
405 Ross Street
Davenport, Wash. 99122
509-725-3646

- The **Russian Thistle Casebearer, Coleophora klimeschiella,** was first introduced to the **United States** in **1977;** and to **eastern Washington** in **1979.**
- The moth is quite able to survive the winter weather of **eastern Washington** without problems.
- The insect **completes 2 to 3 generations annually** in **eastern Washington,** and so there is continual feeding pressure on the plant during the growing season.
- Heavy populations of the **casemaking larvae** cause significant injury to seedling plants and can kill young plants in some instances.
- Each seedling killed results in the reduction of **thousands of seeds per plant** if the plant had reached maturity.
- Each larva consumes from **15 to 24 leaves** during its development. Many larvae will impact the **Russian Thistle's** leaf production and photosynthesis.
- At some sites in **eastern Washington,** plants with up to **50 larvae** have been observed.
- Nearly all the **Russian Thistle** has been attacked by the casebearer larvae at some local sites.
- In some western states, native parasitoids have killed significant numbers of casebearer larvae. However, the impact locally has been minimal.
- By itself, **Coleophora klimeschiella** will not significantly reduce extensive stands of **Russian Thistle.** However, the insect will help retard the weed's continued population increase.
- **Other plants attacked: None.**
- This is the **best biocontrol currently available** until a **mite (Aceria salsolae)** or another **moth (Gymnacela camella)** have received governmental approval for release into the **United States.**

Russian Thistle in an undeveloped area

Larval case on Russian Thistle

Collecting Russian Thistle for firewood

Russian Thistle tumbles along.

A mature Russian Thistle soon to roll away

Biology of Coleophora klimeschiella

- **Origin: Pakistan** and **Turkey**.
- **Generations: Up to three per year,** if mild weather; otherwise, **one or two.** In the lab, **egg-to-adult development** took **40 to 45 days.**
- **Over-wintering Stage: Mature larval in cases** on dried-up **Russian Thistle.**
- **Eggs: Yellowish-brown, ovoid eggs** laid singly **on leaves** or in **leaf axils. The eggs** hatched in about **6 days.**
- **Larvae:** Larvae complete **five growth stages,** the first two as **leaf miners** where they primarily eat the **central pith tissue of leaves.**
- **Casebearing Larvae**: In the **last three larval stages,** they **feed externally** on the leaves as **casebearers. Cases** are made from a **hollowed-out leaf,** and **only the head and forelegs protrude** from the case. The **casebearing larvae** are quite **mobile** and move from **leaf to leaf** and even to **other plants.** They feed by attaching themselves to leaves, chewing through the **epidermis** at the point of attachment, and hollowing out approximately **one cm** of the leaf base. **Larvae** are **orange** and **17 mm long** at maturity.
- **Pupal stage**: Mature larvae **attach their case to a leaf** and **pupate within the case.**
- **Adult stage**: **Brownish-gray moths, 5 to 6 mm long,** commonly found resting on **Russian Thistle** foliage. In the resting position, the adults hold the **antennae back over the dorsal sides** of the body. **Adults** usually **live 11 to 13 days.**
- **Mating: Mating** occurs on the **morning of the second day** after adult emergence.
- **Oviposition: Oviposition** starts on the **third day** and continues for **nine days.** The **maximum number of eggs** laid by a female moth is **178.**