

# *Chrysolina hyperici* (Forst.)

**INVASIVE SPECIES ATTACKED:** St. John's wort (*Hypericum perforatum* L.)

**TYPE OF AGENT:** Foliar feeding beetle

**COLLECTABILITY:** Limited

**ORIGIN:** Great Britain

## DESCRIPTION AND LIFE CYCLE

### Adult:

The beetles are metallic bronze-green coloured and measure 5.3 - 6.1 mm long. The adults emerge in early June and begin feeding in clusters on young terminal leaves, flower buds or the underside of leaves. They continue to feed until leaf drop in July and early August. Reproduction is related to day length, with longer daylight, less feeding and reproduction occurs. This changes again when day length is reduced. At this time they move into plant litter and go into dormancy, awaiting the fall rains. A significant amount of moisture is needed to break dormancy. If dormancy is not broken, mating and egg-laying is delayed until the following spring, which is often the case in Canadian habitats. Adults that do reappear in the autumn will mate. Females oviposit up to 2000 eggs individually or in small clusters onto basal winter foliage. *Chrysolina hyperici* adults are hardier, smaller, and appear later in the spring than *C. quadrigemina*. Colouring can vary between sites, more bronze coloured adults are found in mild climates.

### Egg:

The elongated 1.2 mm x 0.5 mm orange eggs overwinter and hatch the following spring. The eggs are susceptible to desiccation.

### Larva:

The plump, humped-back larvae, initially orange coloured, change to dirty pink-grey as they mature. Newly hatched larvae usually appear in the spring, although some will hatch in the fall. They feed on leaf buds and immature leaves causing complete defoliation before moving on to adjacent plants. Feeding on St. John's wort causes the larvae to become light sensitive. Photosensitivity prevents them from feeding during the day, therefore they must feed during low light periods, and do so before sunrise. After the morning feeding, they seek shade and protection. The smallest hide in leaf buds while the larger ones move under the plants or into the soil. They resume feeding at sunset.

### Pupa:

Mature larvae burrow into the soil during late spring and early summer and create a pupal cell.

### Overwintering stage:

In most cases it overwinters as an egg. However adults and larvae can also overwinter; both have good winter survival in mild climates or under snow cover.

## EFFECTIVENESS ON HOST PLANT

Early spring larvae feedings on fleshy new growth cause the most damage. This timing is the controlling key. Although adult feeding can be impressive, it has less impact than larvae feeding. Heavy fall feeding may cause some impact on the plants' ability to overwinter. In the U.S.A., St. John's wort infestations were reduced by 97% at many sites.



Fig. 1. *Chrysolina* spp. adults



Fig. 2. *Chrysolina* spp. early larvae (credit Powell et al. 1994)

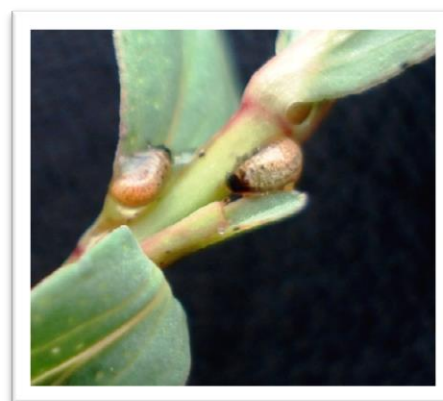


Fig. 3. *Chrysolina* spp. developing larvae

## HABITAT AND DISTRIBUTION

### Native:

*C. hyperici* is native in the Atlantic regions of Europe. In Scandinavia it is restricted to the coastal areas. In Rumania it has shown a higher tolerance for dry conditions than *C. varians*. *C. hyperici* adapts well to ocean or maritime climates, accepting moister sites than *C. quadrigemina* and tolerates higher summer precipitation than other species. It can withstand cold climates with little or no snow cover. It requires soft soils, sites which are rocky or barren are undesirable. It needs open sunny locations; avoiding shaded and forested areas.

### North America:

*C. hyperici* was first released in the U.S.A. before it was introduced to Canada. The populations came from England via Australia in 1945 and were released in Calif., Idaho, Mont., NV, OR, Utah, and Wash. Once established in the U.S.A., collections were made in OR and released into B.C. *Chrysolina* spp. and St. John's wort populations fluctuate; when the infestation decreases (plants are more widely scattered and the patches become less dense), the beetle population also decreases. Later in the cycle, as the plants once again increase (but notably at lower than historical densities), the beetles also become more abundant.

It is adaptable to environmental conditions, enabling it to persist when other species fail. The sites most affected by *C. hyperici* were open sunny sites. Shaded sites are not preferred.

### British Columbia:

Pure *C. hyperici* and mixed populations of *Chrysolina* spp. have been released into the Coastal western hemlock, Interior cedar hemlock, Interior Douglas-fir, Montane spruce, Ponderosa pine and Sub-boreal spruce biogeoclimatic zones. Establishment and dispersal of *Chrysolina* species have been found in all these zones and also in the Engelmann spruce-subalpine fir, but has not been found in the Sub-boreal spruce zone. Some southern interior habitats include elevations to 1100 m. On dry Ponderosa pine sites, *C. hyperici* replaces *C. quadrigemina*.

## BRITISH COLUMBIA RECORD

### Origin:

*C. hyperici* released in B.C. came from reared populations from Enterprise, Oreg. in 1951 and 1952 via Australia populations that originated from Great Britain.

### History:

*C. hyperici* was one of the two species introduced to B.C. near Fruitvale in 1951. Imported populations for field release continued for several years. These early established releases provided collection sources for future B.C. populations and the first field collection occurred in 1981. Over the next few years *Chrysolina* species were released in several locations in the southern interior. Subsequent releases have established and the beetles have dispersed freely with limited assistance.

### Field results:

In recent years, St. John's wort has been re-establishing and, therefore, renewed efforts have been underway to assist with redistributing the beetles in mixed populations. In the southern interior, larvae are readily seen in May and adults are abundant in June.

### Collection for redistribution

By early June, adults can be swept when they cluster on the plants.

## NOTES

- *C. hyperici* are similar to other *Chrysolina* species released in B.C. making identification difficult in the absence of the other species for comparison. *C. hyperici* adults are smaller than *C. quadrigemina* and emerge later in the fall. They also more frequently delay oviposition until spring, therefore, laying fewer eggs in the fall. Of the two, *C. hyperici* is hardier.
- Summer rains do not affect its dormancy.



Fig. 4. General release area of *C. hyperici* near Rock Creek (Interior Douglas-fir zone)



Fig. 5. Established *Chrysolina* spp. site near Christina Lake (Interior cedar hemlock zone)



Fig. 6. Established *Chrysolina* spp. site near Grand Forks (Ponderosa pine zone)

## REFERENCES

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