

Agrilus hyperici (Creutzer)

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

TYPE OF AGENT: Root feeding beetle

COLLECTABILITY: Not available for general distribution

ORIGIN: France

DESCRIPTION AND LIFE CYCLE

Adult:

Agrilus hyperici adults are elongated, 4-5 mm, brown (reddish-bronze) beetles. Their bodies appear somewhat flattened, tapering towards their posterior. They emerge from the roots in late June to early August. Mating begins immediately. Females lay up to 200 eggs individually onto plant stems near the soil surface. Most egg-laying is completed in July. Adults are active during the heat of the day, dispersing freely and residing on upper plant parts.

Egg:

Eggs are greyish coloured. Incubation time and requirements are not known at this time.



Fig. 1. *A. hyperici* adult (credit Norman Rees, USDA Agriculture Research Service, bugwood.org)



Fig. 2. *A. hyperici* larva (Powel et al. 1994)

Larva:

Larvae are white with flat brown heads. Upon hatching, the first instar mine down the stem towards the root, feeding just below the epidermis. This feeding leaves a visible raised feeding trail. All other instars feed within the root, packing their feeding tunnels with debris and frass. Multiple larvae can exist in large roots. Larvae can be infected with fungal infections when developing in moist conditions.

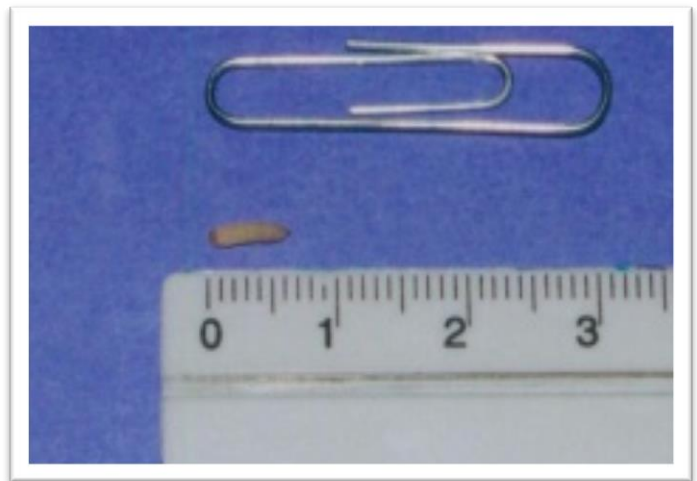


Fig. 3. *A. hyperici* larva (size)

Pupa:

Pupation occurs within the root from May through early July. The pupa are initially creamy white coloured, but darken to a deep brown during the pupation process. In the lab, pupation takes about 15 days to complete.

Overwintering stage:

Mature larvae overwinter in host plant roots.

EFFECTIVENESS ON HOST PLANT

Larvae root feeding weakens and often kills the plant. They can consume all root tissue, creating stunted stem growth and reducing floral and seed production. Adults feed on the foliage but have little impact on the plant. *A. hyperici* attacks plants in shaded areas which are commonly avoided by other St. John's wort agents.

HABITAT AND DISTRIBUTION

Native:

A. hyperici originates in southern, central and eastern Europe. In its native distribution, *A. hyperici* only occurs in the driest areas and is found more frequently in the southern-most part of its range. *A. hyperici* requires warm, dry locations and tolerates sun and shade. Moist sites are avoided. They have a preference for large stemmed plants on which to feed, develop and reproduce.

North America:

In the U.S.A. it is common in mountain areas, but sites over 1000 m in Canada may not be productive. *A. hyperici* is now established in B.C., Calif., Idaho, Mont., Oreg., and Wash.

British Columbia:

In B.C., *A. hyperici* is predicted to be at its most northern limit. To date it has been found established at release and dispersal sites occurring in the Engelmann spruce-subalpine fir, Interior cedar hemlock, Interior Douglas-fir, and Ponderosa pine biogeoclimatic zones. No establishment has been found in the Coastal Douglas-fir zone. The release site in the Gilpin area near Grandforks is in the Interior Douglas-fir zone is considered to be ideal habitat.

BRITISH COLUMBIA RECORD

Origin:

The earliest (1950's-1970's) *A. hyperici* released in B.C. came from Calif. and the later (1980's) came from Idaho. Both USA sources originate from stock from France.

History:

The first *A. hyperici* release was made in 1955 near Christina Lake and the second release occurred in 1964 near Edgewood. Additional attempts to establish the agent continued from the mid 1970's through to the late 1980's, with releases occurring near Elko, Grandforks, and Trail. In 2008 the first field collection was made from an *A. hyperici* dispersal location near Grandforks and released near Cassidy on Vancouver Island. In 2016, 77 adults were collected from near Christina Lake and released near Tappen. It is not known if this site was sprayed with herbicide the following year or if the plants simply failed to produce basal foliage in July or August due to a severe prolonged drought period.

Field results:

Slow establishment has limited redistribution efforts. Early monitoring records indicate neither of these had established. Subsequent monitoring for *A. hyperici* did not show establishment at any sites until 1990 when 10% of the plants sampled at the 1987 release near Grandforks (Gilpin area) were found to have root feeding damage. In 2004 larvae were found in late May at the Gilpin site. By mid-June they were pupating, and in early July through early August adults were present. Recent investigations indicate that *A. hyperici* is widely dispersing in the Southern Interior Forest Region and is now considered established at all release sites in this area except for the one near Edgewood. The 2008 release made in Vancouver Island was the first attempt to move *A. hyperici* into the west coast habitat and its establishment is not yet confirmed. *A. hyperici* have been found sharing sites



Fig. 3. *A. hyperici* release near Nelway (Interior cedar hemlock zone, bordering established release site in the Engelmann spruce-sub alpine fir zone)

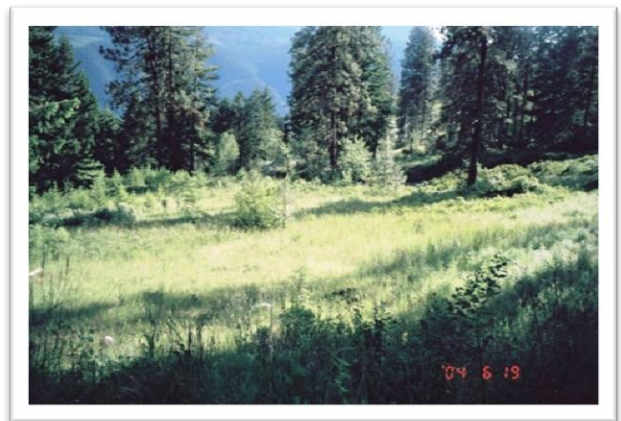


Fig. 4. *A. hyperici* dispersal location near Grand Forks (Ponderosa pine zone)



Fig. 5. Historical *A. hyperici* release site near Grand Forks (Interior Douglas-fir zone)

with *Chrysolina spp.*, *Aplocera plagiata*, and *Aphis chloris*. In July 2013, a collection attempt was again made from the Grand Forks area, but, insufficient adults were found. Collection and redistribution attempts are continuing.

NOTES

- *A. hyperici* disperses widely from release locations and often cannot be recovered for several years at new sites.
- Ministry staff collected several adults from two dispersal sites in 2013 and provided them to the National Identification Services of Canada for specimen samples in the national insectaria.
- Figure 1 has been cited according to the contributor's specified requirements as of 2015-03-10.

REFERENCES

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