

Urophora solstitialis (L.)

INVASIVE SPECIES ATTACKED: Plumeless thistle (*Carduus acanthoides* L.)
Nodding thistle (*C. nutans* L.)

TYPE OF AGENT: Seed feeding fly

COLLECTABILITY: Not established

ORIGIN: Austria

DESCRIPTION AND LIFE CYCLE

Adult:

Urophora solstitialis adult flies are 5-8 mm long, have black bodies with light brownish-yellow thoraxes and yellow heads and legs. They have 3.1-4.5 mm long clear wings with slender dark bands forming two "V's". Females can be identified by their long, pointed ovipositor. Adults emerge over six weeks beginning in late spring to early summer which coincides with the flower bud stage. Mating begins immediately and oviposition starts within 1-2 days. Adults live for several weeks and are present for most the summer enabling them to oviposit into early and late buds. Females oviposit an average of 100 eggs which are deposited individually, but oviposition may occur several times into the same bud.

Egg:

Eggs develop over three days. Specific detail about egg size, shape and colour are not known at this time.

Larva:

Larvae are creamy-white, barrel-shaped and have black posteriors. When mature, they are 3-4 mm long. Newly hatched larvae mine florets inducing the plant to create gall formations around each larva. The first moult occurs before they reach the receptacle. They continue to feed through their second instar inside the seedheads as the galls begin to form. They moult again and the third instars feed on gall tissue that has formed. In time, the gall hardens and becomes woody. Multiple larvae cause the galls to fuse together to form a large mass. The larvae that complete development prior to the end of June emerge as second generation adults that will then mate and oviposit, however, most larvae will overwinter and pupate the following spring. Mature larvae prepare for pupation inside the galls.

Pupa:

Mature larvae prepare for pupation inside the galls.

Overwintering stage:

U. solstitialis will overwinter as first generation mature larvae or as second generation larvae within galls in the seedhead.

EFFECTIVENESS ON HOST PLANT

Gall formation exhausts plant nutrient reserves and reduces overall plant vigour. The main control of the target plants is achieved by larvae feeding in flower buds and, therefore, reducing seed production. A maximum of 10 larvae can be present in each seedhead where each is responsible for destroying five seeds each. Studies indicate seeds are reduced in 30% of all plants and reductions have been recorded up to 81% in individual heads. In Ont., larvae attacking seedheads reduced seed production by 17% in three years.



Fig. 1. *U. solstitialis* adult (credit Powell et al. 1994)



Fig. 2. *U. solstitialis* larva in thistle seedhead (credit P. Harris, Agric. & Agri-Food Canada, Bugwood.org) See notes.

HABITAT AND DISTRIBUTION

Native:

The fly occurs throughout Europe and North Africa. Observations and recorded presence indicate it to naturally occur in Sweden, Denmark, UK, Spain, France, Benelux, Germany, Switzerland, Austria, Poland, the former Czechoslovakia, Hungary, Italy, Yugoslavia, Rumania, Bulgaria, and Austria.

North America:

Specific *U. solstitialis* habitat requirements are unknown. In Canada it has established in Ont. In The U.S.A. the fly was released in Md. in 1993, but has not been found established.

British Columbia:

U. solstitialis was released in the Interior cedar hemlock biogeoclimatic zone, but no establishment evidence has been found to date.

BRITISH COLUMBIA RECORD

Origin:

The *U. solstitialis* released in B.C. originate from Steinfeld, Austria where it occurs on nodding thistle.

History:

A single *U. solstitialis* release was made in 1991 into the central lower Kootenays between Trail and Nelway along the Pend d'Oreille River on a mixed stand of plumeless and nodding thistles. No establishment has been found at the site nor in the general release area.

Field results:

The single release site has been revisited many times, but no flies have been recovered. The site has been repeatedly sprayed with herbicide, but it is not known if this effected establishment. Monitoring focuses on landscape dispersal as well as inspection of remaining plants at the site.

NOTES

- *U. solstitialis* and *U. jaceana* are commonly misidentified.
- *U. solstitialis* can co-exist with *Rhinocyllus conicus* and *Trichosiromus horridus* on nodding and plumeless thistles, however, *R. conicus* may slowly be displaced by other seedfeeders in stands of plumeless alone.
- Figure 2 has been cited according to the contributor's specified requirements as of 2015-03-04 www.invasives.org.

REFERENCES

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