Urophora jaceana, Hg.

INVASIVE SPECIES ATTACKED: Brown knapweed (*Centaurea jaceae* L.)
Black knapweed (*C. nigra* L.)
Meadow knapweed (*C. debauxii* Gren. & Godr.)

TYPE OF AGENT: Seed feeding fly

COLLECTABILITY: Not established

ORIGIN: Europe

DESCRIPTION AND LIFE CYCLE

Adult:
Urophora jaceana adult flies begin to emerge in June and do so at staggered intervals over a long period. Mating begins immediately. Females oviposit into flower buds that are just starting to open. The eggs are laid in small groups, 1-4, between the florets. The females will lay 70-100 eggs each. The adult life span is about 30 days.

Egg:
The eggs hatch in 8-11 days.

Larva:
Larvae move down the florets and into the (flower) receptacle. As a result of the intruding larvae, the receptacle enlarges. Galls form around each larva and when multiple larvae are present, the galls fuse together. The larvae feed for three months and prepare to overwinter. When eggs are laid in large quantities into seedheads, there is an increase in larvae mortality prior to the gall forming stage.

Pupa:
The pupation period lasts 4-5 weeks and occurs the following spring.

Overwintering stage:
Larvae overwinter in galled seedheads.

Fig. 1. *U. jaceana* adult (credit M. Tugeon www.bugguide.net). See notes.

EFFECTIVENESS ON HOST PLANT
Larvae attack seedheads and create woody galls. Multiple galls merge together to form a larger mass. In Britain, *U. jaceana* attacked seedheads produced half the number of seeds of non-attacked seedheads. The galled heads are a metabolic sink that results in fewer flowers and, therefore, fewer seeds. An estimated 60% seed reduction is predicted when seedheads are attacked by *U. jaceana*. In Nova Scotia, the flies infest 75% of all seedheads with 3-6 larvae present in each gall.

HABITAT AND DISTRIBUTION

Native:
U. jaceana is found in France, Belgium and Denmark.

North America:
In Canada, *U. jaceana* is established in Nfld. and N.S. and is predicted to be present in the other Maritime Provinces. It is also suspected to be present in the north eastern U.S.A.

British Columbia:
At this time, the habitat requirements for *U. jaceana* are not known.

BRITISH COLUMBIA RECORD

Origin:
The first *U. jaceana* releases in B.C. were made from adventive populations found established in the Canadian maritimes. The fly is believed to have entered Canada from Europe in ship ballasts with its host plant decades ago.

History:

In 1987, *U. jaceana* was released in three field locations in Seymour Arm and Salmon Arm of the Shuswap area, on what was originally recorded to be brown knapweed. Since then, the plants growing on each of the sites have been identified as a mixed stand of three to four *Centaurea* species. At the Seymour Arm release sites the knapweed species include: brown, black, and meadow. At the Salmon Arm release site the knapweed species include: black, brown, meadow, and short-fringed. It is unknown if the plants were growing in a mixed stand at the time of the release or if the other species were introduced later. No establishment has been confirmed since the release was made.

Field results:

Records indicate the flies had established one year following the release, but, no recent sightings have been confirmed. Monitoring has continued at the Salmon Arm site more frequently than the two at Seymour Arm. *Urophora spp.* pupae found inside the meadow knapweed seedheads were reared and the resulting adults were identified as *U. quadrifasciata*. The fly was much smaller than normal and it was speculated to be a result of development on a less preferred host plant. The three release sites are showing a decline in host plants that may in part be attributed to other petitioned biocontrol agents that have intentionally been released or have self-dispersed to the sites (for example, *Larinus spp*.) as well as other invasive plant management practices. In 2008, more adult flies were collected and were once again found to be *U. quadrifasciata*. Due to the age of the releases, future efforts will focus on monitoring the original release sites and carrying out landscape dispersal sampling.

NOTES

- *U. jaceana* and *U. solstitialis* are commonly misidentified.
- *U. jaceana* arrived in North America with the parasite *Habrocytus elevatus* which is responsible for an 8% loss of larvae.
- Figure 1 has been cited according to the contributor's specified requirements as of 2015-03-04.

REFERENCES

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3. _____. 2003. Classical biological control of weeds established biocontrol agent *Urophora cardui* (L.). Stem-gall fly. Agriculture and Agri-Food Canada. Updated April 11, 2003 http://res2.agr.ca/lethbridge/weedbio/aurocard_e.htm (Accessed May 20, 2003).
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