

## Swede midge (*Contarinia nasturtii* Keiffer) monitoring

### Pheromone Traps for Adult Monitoring:

- The Jackson Trap, with removable sticky liners and lures containing swede midge sex pheromone, is used to monitor adult swede midge populations.
- Lures should be stored in their unopened, foil-lined packets in sealed containers at temperatures below 0°C.
- Wear disposable gloves when handling lures and use a new pair of gloves between handling lures of different types. This will avoid cross-contamination of the pheromones and possible interference with their attractiveness.

### Site Selection & Trap Placement:

- Swede midge adults are not strong fliers and prefer areas of low wind movement, resulting in more damage along field edges (especially those fields close to previous year's canola), in sheltered areas, and near buildings.
- **Two (2) traps** will be placed at each field, 40-50 m apart.
- Traps should be set near the edge of canola fields **at the canola seedling stage, and retrieved just prior to crop harvest**. Place traps in a location that gives you best coverage, incorporates micro-habitats such as those adjacent to canola stubble, shelterbelts and areas of higher humidity, and has good accessibility.
- The stake or rod height should be above the predicted final height of the crop and should be flagged to allow easy detection in the field for the inspector and grower. **Place the trap so that the bottom is 30 cm above the ground**. Use string or wire to attach the traps to the stakes or rods to prevent them from twisting or moving; orient the traps in the field so that the pheromone plume is dispersed down the row or into the field.



- Because swede midge larvae and pupae can be carried in soil, care must be taken when working within a block/field. To prevent the inadvertent movement of swede midge, footwear should be cleaned thoroughly before moving to a new address. Disposable “booties” or rubber boots are recommended.

#### Trapping Procedure:

- **Trap liners need to be changed weekly** during the growing season. It is important that this schedule is followed as closely as possible - sticky liners covered in field debris make it almost impossible to see the very tiny swede midge.
- Complete the label attached to the back of the trap liners when you remove them from the trap housing. If swede midge damage is observed please record those observations on the liner label or datasheet.
- Fold each trap carefully into a circle with the sticky surface inside; hold it with a rubber band (Figure 4) and place the two liners from each site together in a plastic sandwich bag.
- **Replace the lures in the traps after 28 days.**

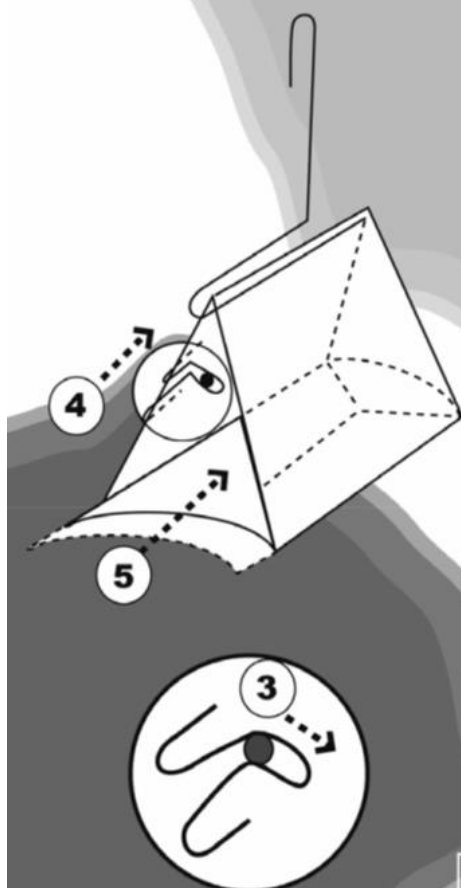
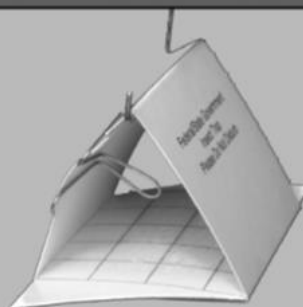


Damaged, missing, or badly weathered traps should be replaced.

## JACKSON TRAP ASSEMBLY INSTRUCTIONS

### Components:

- 1 Jackson trap
- Sticky insert (packed in pairs)
- 1 wire hanger
- 1 dispenser holder



### How to assemble:

- 1 Fold open Jackson trap to form a tent shape.
- 2 Remove lure from foil pack (Avoid touching dispenser surface with fingers.).
- 3 Insert plastic or rubber dispenser only into the middle notch of the dispenser holder.
- 4 Slide dispenser holder onto side of trap so that the lure is on the inside and the two legs are on the outside.
- 5 Peel apart face-to-face sticky liners and slide one insert into trap.
- 6 Attach metal hanger as illustrated and hang trap in desired location.
- 7 Replace inserts as required.

### NOTE TO USER:

To prolong storage life, refrigerate or freeze unused dispensers in their foil packets.

To avoid contamination, use tweezers or rubber gloves when handling dispensers.

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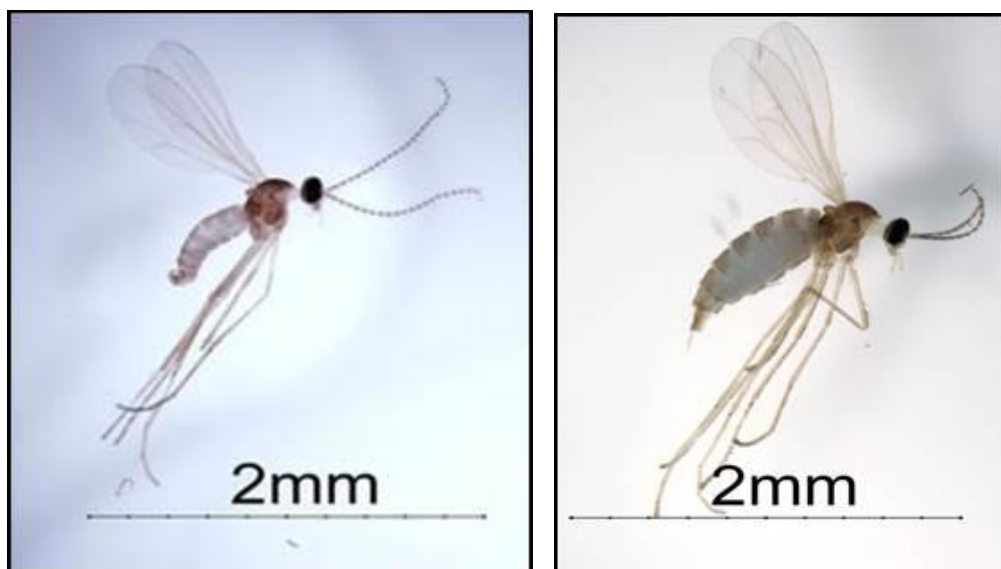
## Swede midge (*Contarinia nasturtii* Keiffer)

### Lifecycle and Damage

**Host Plants:** Plants belonging to the family Brassicaceae such as canola, mustard, cabbage, cauliflower and Brassica weeds.

### Identification, Life Cycle and Damage:

**Adults:** Adults are small (1.5-2 mm in size), light brown flies (Figure 1) with long filamentous antennae. Male antennae have 12 sections with swollen ends, so that the antennae look like they are composed of 24 circular beads. The 12 segments of the female antennae are cylindrical. Wing venation is reduced. Cross veins are absent, the radial vein is straight or nearly so and a cubital fork is present. Pre-pupae overwinter in the soil in and near fields; **Adults appear in the spring when temperatures rise and when soil moisture is ample.** They fly during the day.



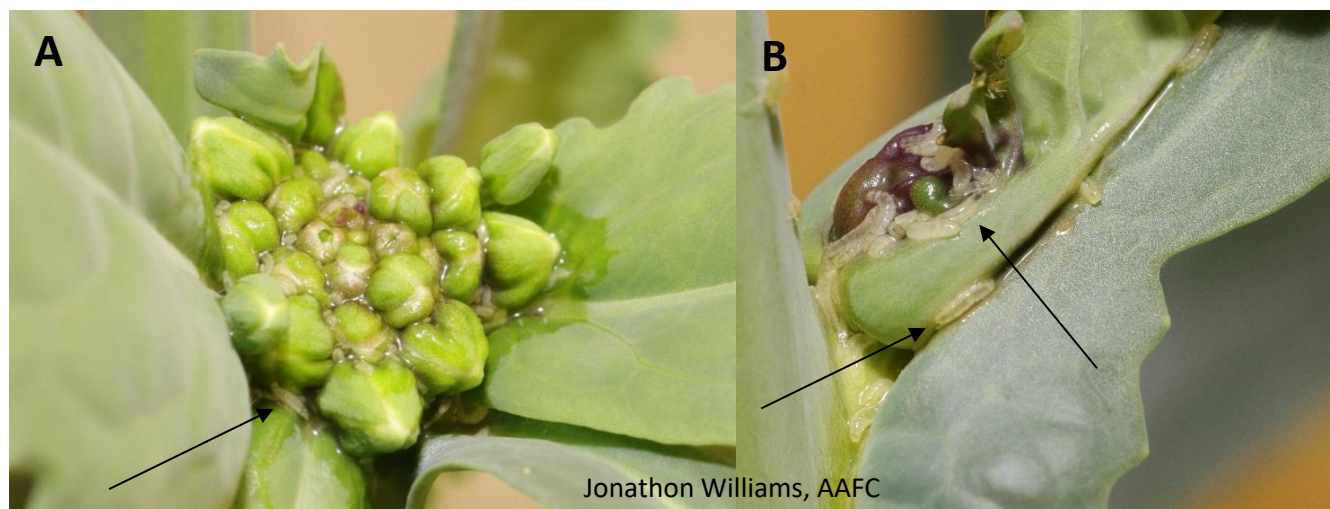
**Figure 1. Male swede midges (left) live 1 day; female swede midges (right) live 1-5 days. Photos: Susan Ellis, USDA APHIS PPQ, bugwood.org**

**Eggs:** Eggs are laid in clusters of about 2-50 in rapidly growing points of the plant such as developing leaf and bud clusters. Each female fly can lay up to 100 eggs. Eggs are very small (0.3 mm) and transparent in color when first laid, but change to creamy white color as they mature.

**Larvae:** Small maggots can be found feeding in groups near the growing points of the plant. Initially the larvae are 0.3 mm in length and transparent. At maturity, larvae are 3-4 mm in length and yellow in color (Figure 2). Larvae spin cocoons and pupate in the soil.

**Pupae:** Pupation takes place approximately 2.5-5 cm deep in soil near the host plant. Prepupae can go into a state of diapause, overwintering in silken ovoid cocoons in the soil and pupating in the following spring. However, some prepupae overwinter a second season before becoming adults. Larvae and pupae require a moist environment to mature. In Ontario, 3-4 overlapping generations have been reported.

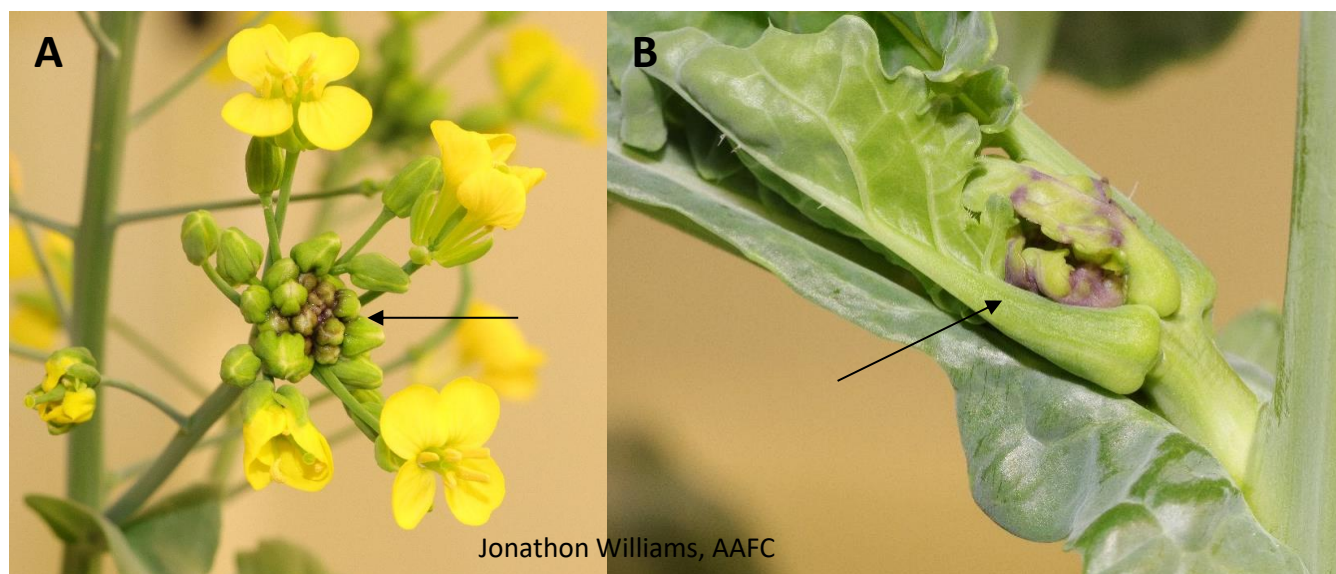




**Figure 2. Swede midge larvae live for 7-21 days. Photos: Jonathon Williams, AAFC.**

### Checking Crops for Swede Midge Damage:

Damage caused by feeding of swede midge larvae results in changes in the physiology of the plant (Figure 3). The growing tip may become distorted and produce several growing tips or none at all, young leaves may become swollen crinkled or crumpled, a purple colour may develop on damaged growth points, and brown scarring caused by larval feeding may be seen on the leaf petioles and stems. Flowers may fail to open. **Young plants that show unusual growth habits should be examined carefully for damage and larvae;** especially if the sticky liners have many flies that look like midges (swede midges are about the size of orange blossom wheat midge but are not orange). **Larvae can be seen with a hand lens.**



**Figure 3. Canola florets (A) and growing points (B) infested with swede midge larvae. Photos: Jonathon Williams, AAFC.**