Strawberry blossom weevil is on the radar of Canadian berry growers

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Strawberry blossom weevil (*Anthonomus rubi*) was first found in North America in 2019 in a backyard patch of raspberries in the Fraser Valley of British Columbia (BC). It is now known to be established throughout the Fraser Valley of BC and northwest Washington State. This small black weevil is native to Europe, Asia, and parts of North Africa. Although its name may mislead you to think it is only a pest of strawberries, this is not the case. It is a pest of many wild and cultivated plants in the rose family, including raspberry, blackberry, thimbleberry, and rose.

The adult weevils are long-lived and complete just one generation per year. They spend the winter in plant debris near the soil surface and become active in the spring when temperatures start to warm up. Adult weevils feed on leaves, flowers, and fruit, but it is the female weevil and her offspring that are responsible for most of the damage. After an adult female mates in the spring, she lays her eggs inside of developing flower buds. She first chews a hole in the bud, then lays her egg inside (typically one per bud) and partially severs the stem below causing the bud to shrivel and no fruit to form. The egg hatches inside of the bud and the larva feeds inside until it pupates and develops into an adult. The adult weevil exits by chewing a hole in the bud. Weevils that emerge from buds over the growing season will overwinter, completing the annual cycle.

We know that the weevil can cause significant damage in berries in its native European range, so the pest might also be cause for concern for Canada's berry growers. In Europe, bud clipping in raspberries has been found to exceed 30% in some cultivars. In strawberries and roses, clipping damage has been found to exceed 50% and 60%, respectively. However, the weevil's impact on strawberry yield may vary due to the ability of strawberries to compensate for damage through new bud production. In BC, we have observed clipping damage in strawberry and raspberry field crops as well as some berries grown under high tunnels.

Over the past couple of years, this small weevil has impacted the movement of strawberry, rose, and raspberry in to the United States (US). As of September 14, 2021 the United States Department of Agriculture Animal and Plant Health Inspection Service put in place a Federal Order (DA-2021-25) that amended the entry requirements for plant imports of these species (not fruit) from Canada to the United States. Plants exported from Canada to the United States are now required to have a pest module in place to establish facilities as strawberry blossom

weevil pest-free places of production or pest free production sites. This status must be documented on phytosanitary certificates issued in support of plant exports.

With the help of many researchers, provincial specialists, and crop consultants across Canada, a surveillance team has been helping to delimit the current range of strawberry blossom weevil in Canada. We designed standardized survey methods, along with an app to records all sample collections in a standardized way.

With the collection of many weevils across Canada, identification can be a challenge. There are approximately 40 species of weevils across Canada that belong to the same group (genus *Anthonomus*) as strawberry blossom weevil, some of which could easily be confused with strawberry blossom weevil. One of the most likely look-alike weevils that some Ontario berry growers may be familiar with is strawberry clipper weevil (*Anthonomus signatus*). This weevil is native to eastern Canada and causes similar clipping damage to strawberry blossom weevil in strawberry and raspberry fields in Ontario. These weevils can be distinguished by colour – strawberry blossom weevil is black, whereas strawberry clipper weevil is reddish brown in colour. Weevil identification is still underway with the help of our beetle expert, Dr. Patrice Bouchard from the Canadian National Collection of Insects, Arachnids, and Nematodes. The good news is that so far, the distribution of strawberry blossom weevil remains limited to coastal BC and northwest Washington State.

To date we do not have any scouting threshold (count of clipped buds or adult weevils that would be used to indicate when a management action should be taken) or insecticides registered for strawberry blossom weevil in Canada. However, in the meantime, we can look to some of the cultural practices that the Ontario Ministry of Agriculture, Food, and Rural Affairs (OMAFRA) recommends for management of strawberry clipper weevil. For example, crop rotations and keeping strawberry planting for two years or less (Ontario Crop IPM, OMFRA) could potentially help to reduce strawberry blossom clipping damage in BC. In addition, we have found a tiny parasitic wasp in BC, likely a species that is new to science, that is contributing a small amount (~1-3% parasitism) of natural pest control. Lastly, through collaboration with the Centre for Agriculture and Bioscience International (CABI) in Switzerland we are conducting foreign exploration to search for other specific and effective potential biological control agents for strawberry blossom weevil.

Strawberry blossom weevil adults feeding on green fruit and bud clipping damage in high tunnel production in British Columbia (British Columbia Ministry of Agriculture and Food).