Western Corn Rootworm

Diabrotica virgifera

January 2018

- **Detected for the first time in the Fraser Valley in 2016 and reached record levels in local corn fields during the 2017 season**
- **Single most important factor contributing to economic loss and shifting management practices in corn growing regions in North America**

Damage:

Adults: clip corn silks which interferes with pollination and may result in **poorly-filled cobs**. Beetles and frass can contaminate fresh market sweet corn. They feed on the top layer of leaf tissue and eat the flowers of a variety of crops, including cucurbits.

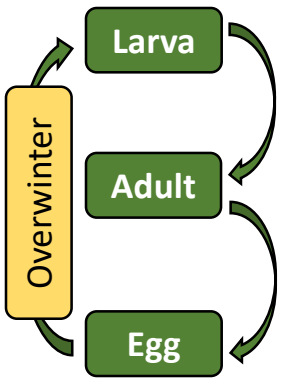
Larvae: feed on corn roots **reducing structural integrity and nutrient uptake** resulting in weak, unstable plants.

Identification:

Larvae: White, 3-15mm long; brown head capsule, 6 legs, with a dark patch at the end of the abdomen.

Adults: Yellow, ~6mm long beetles with 3 black parallel stripes (females) or a solid black patch (males).

Life cycle - one generation per year



Late Spring - Early Summer: Larvae hatch from last fall's eggs, cause root damage.

Mid Summer: Adults emerge, begin feeding and mating.

Late Summer - Fall: Eggs are laid in the soil in corn fields where they overwinter until next spring.

Monitoring:

Adult beetles: Active in late July-August. Visually inspect 20 plants at 5 locations for adults and feeding damage. In sweet corn, consider a foliar spray if there are **more than 10 adults per plant**. For forage corn, damage by beetles is of less concern – however presence of adults is is an indicator that larvae will be present in the next season and will cause damage.

Larvae: *Monitoring for larvae is useful to determine if the insect is present in a field.* Sample weak-looking areas in the field by digging around the roots and lifting it onto a dark plastic sheet. Search through corn plant roots and crowns for larvae. For fields where whole plants are missing, the cause is more likely due to wireworm than western corn rootworm.

Created by: cropconsult

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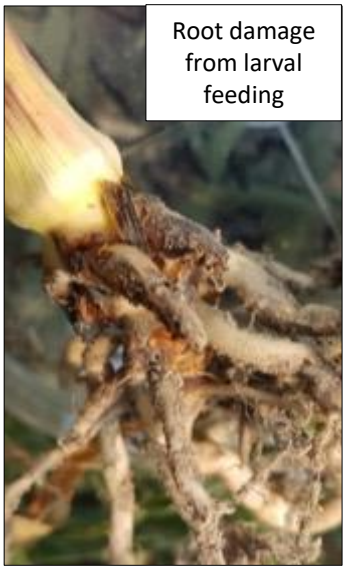
Monitoring and Management of Western Corn Rootworm

Risk Factors*: *Use these to decide your level of risk

If a primary factor is present, management action is needed. Precautionary measures should be taken if multiple secondary factors are also present.

Primary risk factor	Secondary risk factor
-Beetles present in the area in previous years -Goosenecking/lodging or root damage in crop	-Crop is planted late -Over 3 years in corn -Non-sandy soil



Root damage from larval feeding

Management:

Crop rotation *is the most effective way to break the life cycle*

- Avoid planting corn more than 3 years in a row
- Rotate out of corn for 1-2 years

If corn is planted year after year into corn, eggs laid the previous summer and fall will hatch the next spring and the larvae will feed on the growing corn roots. If a crop other than corn is planted, the larvae do not survive.

When rotation is not an option, and one or more risk factors are present, consider <u>one</u> of the following:

<u>Variety selection</u> - Choose transgenic (Bt) varieties that are resistant to rootworm. Only use Bt varieties for three years in a row in a field as beetles can develop resistance to these varieties.

<u>Chemical control</u> – Use in-furrow or t-band application of insecticides at planting. Though seed treatments with insecticides may help, these will not fully control the pest or prevent damage. If monitoring for adults warrants, spray registered insecticides before harvest to mitigate cob contamination and poor pollination from adult feeding.

Note that there is no added efficacy from adopting both varietal and chemical management. Only one of the two should be selected.

Silk feeding

Window-pane leaf feeding

Further resources:

OMAFRA: omafra.gov.on.ca/IPM/english/sweet-corn/insects/corn-rootworm.html
Purdue U: extension.entm.purdue.edu/fieldcropsipm/insects/corn-rootworms.php
MSU: fieldcrop.msu.edu/uploads/documents/E2438.pdf
Check current Canadian labels at: pr-rp.hc-sc.gc.ca/ls-re/index-eng.php
B.C. Vegetable Production Guide (Sweet corn chapter): productionguide.agrifoodbc.ca/guides/17