

European Corn Borer (ECB) Management

Pest Facts

- ECB is one of the most damaging insect pests of corn. It was first discovered in Manitoba in 1948.
- Larvae feed on above-ground parts of a corn plant, chewing tunnels in corn stalks and ears.

Life Cycle

- Larvae overwinter in cornstalks, ears and other residue.
- Moths emerge from pupae in late June / early July and mate.
- Females lay egg masses on the underside of corn leaves near the mid-rib. Egg masses contain about 10 to 40 eggs.
- Egg masses are initially white and appear more black right before hatching (due to color developing in heads of larvae).
- Eggs hatch after 5 to 7 days, and larvae begin feeding. At this time they are small in size – about 1/10 inch.
- Newly hatched larvae appear white but become tan with black spots as they mature, attaining about 1 inch in length.
- At the end of the season, larvae tunnel into the stalk and prepare to overwinter.

Plant Symptoms and Impact on Crop

- “Window-pane” damage results from newly hatched (first instar) larval feeding on surface of corn leaf.
- “Shot hole” damage results from feeding inside the whorl.
- Tunneling in leaf mid-ribs as well as stalks, ear shanks and ears interferes with water and nutrient movement.
- Tunneling damage to the plant leads to reduced ear size and test weight. Heavy infestations may result in stalk breakage and ear droppage.
- Mature larvae feed on silks, kernels and cobs.
- This ECB feeding may result in moderate to severe yield loss.



Windowpane damage (left) and shot-hole damage (right) from European corn borer larval feeding.

Management

- **Resistant (Bt) corn hybrids** provide excellent control of ECB without harming beneficial insects.
 - Several Bt corn products to consider include Pioneer® hybrids **39D97** (HX1, LL, RR2), **P8107_{HR}** (HX1, LL, RR2), **39B94** (HX1, LL, RR2), **P8210_{HR}** (HX1, LL, RR2), **39V07** (HX1, LL, RR2) and **39Z69** (HX1, LL, RR2) as well as Pioneer® **P8193_{AM}**™ brand corn (AM, LL, RR2).
 - Two new corn products are Pioneer® hybrid **P7632_{HR}** (HX1, LL, RR2) and Pioneer® **P8016_{AM}**™ brand corn (AM, LL, RR2).
- **Fall tillage, mowing stalk residues or chopping** the plant for silage can reduce overwintering populations.
- **If using insecticides**, target young larvae (first and second instar) before they start tunneling into the stalk. Management by insecticides begins with scouting, using these methods:
 - Start in early July, and scout every 5 to 7 days. Look for egg masses or hatched larvae on 20 plants in 5 locations in field. Be sure to check for any feeding inside the whorl.
 - Calculate the number of corn borers per plant, and compare against the economic threshold table below.



Larval stages of ECB.
1st instar at left;
5th instar at right.

Economic Threshold (number of larvae/plant)

Control Costs ¹ (\$/acre)	Crop Value (\$/acre)					
	150	200	250	300	350	400
6	1.00	0.75	0.60	0.50	0.43	0.38
9	1.50	1.12	0.90	0.75	0.64	0.56
12	2.00	1.50	1.20	1.00	0.86	0.75
15	2.50	1.88	1.50	1.25	1.07	0.94
18	3.00	2.25	1.80	1.50	1.29	1.13
21	3.50	2.63	2.10	1.75	1.50	1.32
24	4.00	3.01	2.40	2.00	1.72	1.51
27	4.50	3.38	2.70	2.25	1.93	1.70

¹Control costs = insecticide price (\$/acre) and application costs (\$/acre)
Source: <http://www.gov.mb.ca/agriculture/crops/insects/fad46s00.html>