

Scout for Unexpected Injury in Bt corn by European Corn Borer in 2024

Canadian Corn Pest Coalition – ECB Resistance Subcommittee

Some European corn borer (ECB) populations are becoming less susceptible to Bt corn. Increased scouting of Bt corn and reporting feeding injury is important to detect these populations. In addition, stalk shredding after harvest needs to become a common practice again to slow the spread of resistant ECB.

Current Resistance Status of ECB: Since the first discovery of European corn borer (ECB) populations resistant to Cry1F protein in Nova Scotia in 2018, additional detections of injury by ECB feeding on Bt corn have been found both in Canada and the US. Through increased monitoring and sampling efforts across Canada, populations of ECB resistant to Cry1F were found throughout NS, and in a field near Carman, Manitoba and Montreal, Quebec. Most recently, in 2023, feeding injury on plants containing both Cry1Ab and Cry1A.105 was observed in a field in Truro, NS and on plants containing Cry1Ab, Cry1A.105 and Cry2Ab2 in a field near Sussex, NB and New Haven, Connecticut. While bioassay results are pending, these observations suggest that some ECB populations are becoming more tolerant to the only four Bt proteins currently available for use in corn for ECB protection. These are early warning signs that Bt resistance is developing in ECB populations and spreading, increasing the need for scouting for and reporting any feeding injury found on Bt corn.

Scouting and Reporting are Critical: Efforts are underway across North America to further expand monitoring, collection and testing of ECB populations but some of the resistant populations have come from unexpected injury reports by agronomists, extension reps or growers. This speaks to the importance that anyone growing ECB Bt hybrids (Cry1F, Cry1Ab, Cry1A.105 and Cry2Ab2) needs to scout for signs of ECB feeding in their fields at least once before harvest, especially while leaves are still green and can be gene checked to confirm they are producing Bt proteins.

Walk through each Bt field, covering at least 10 to 20 different areas, looking for signs of ECB feeding including leaf or whorl feeding, frass and stalk tunneling at the leaf axils, bent or broken stalks and a tell-tale sign - broken tassels. Any signs of feeding injury should be reported to your seed provider and provincial specialist for further investigation. Don't assume the injury is limited to only the 5% of non-Bt refuge plants as part of the integrated refuge in the field.



Early season ECB feeding includes whorl feeding, mid-rib mining (T. Baute, OMAFRA) and repeated pinholes across leaves (J. Smith, UGRC).

Slowing the Spread of Resistance: Do not plant Bt hybrids that contain only one ECB Bt toxin and avoid planting hybrids that have the same Bt toxins reach year. Adding stalk shredding during or after harvest as a common practice can help significantly reduce ECB from successfully overwintering and slow the spread of resistant populations the following year.

If you find feeding injury by ECB in a Bt field, contact your seed provider and provincial contact below. For more information on ECB resistance, Bt hybrids and resistance management practices, visit the Canadian Corn Pest Coalition website at www.cornpest.ca

Provincial Contacts for Feeding Injury by ECB in Bt Corn:

Province*	Contact	Phone	Email
Nova Scotia	Caitlin Congdon	902-698-9473	ccongdon@perennia.ca
Prince Edward Island	Suqi Liu Shauna Barry	902-218-2653 902-314-0388	sxliu@gov.pe.ca slbarry@gov.pe.ca
New Brunswick	Chris Maund Jason Wells	506-453-3477 506-432-2150	chris.maund@gnb.ca jason.wells@gnb.ca
Québec	Julien Saguez Brigitte Duval	450-464-2715 ext. 249 819-293-8501 ext. 4432	julien.saguez@cerom.qc.ca brigitte.duval@mapaq.gouv.qc.ca
Ontario	Tracey Baute Jocelyn Smith	519-360-7817 519-784-2430	tracey.baute@ontario.ca jocelyn.smith@uoguelph.ca
Manitoba	John Gavloski	204-750-0594	john.gavloski@gov.mb.ca
Saskatchewan	James Tansey	306-787-4669	james.tansey@gov.sk.ca
Alberta	Shelley Barkley	403 362-1350	shelley.barkley@gov.ab.ca

*ECB is currently not in British Columbia and is a regulated pest in that province. If ECB is found, report your sighting to the [Canadian Food Inspection Agency](http://www.inspection.gc.ca).



Later season ECB feeding injury includes frass and stalk tunneling at the leaf axils, broken tassels and bent or broken stalks (J. Smith, UGRC).