

2017 Grain Corn Ear Mould and Vomitoxin (DON) Survey

Purpose:

OMAFRA field crop staff with the assistance from members of the Ontario Agri-Business Association (OABA) completed the annual Provincial corn ear mould and mycotoxin survey in 2017. These mycotoxins, particularly vomitoxin (DON) produced primarily by *Gibberella/Fusarium* ear moulds can be disruptive when fed to livestock, especially hogs. The purpose of the annual survey is to assess grower and industry risk.

Methods:

From October 7th to 19th, a total of 179 corn ear samples were collected from across the province and rated for visible ear mould infection. Five consecutive ears were pulled from four random locations throughout a field. After recording pictures to document the presence of moulds, insect, bird feeding damage, etc, samples were placed into driers as soon as possible after collection. Dry ears were shelled and mixed through a sample splitter and delivered to SGS Agri-Food Laboratories in Guelph for vomitoxin (DON) analysis.

Results:

Of the 179 samples collected:

- 69% (124) had a DON concentration of less than 0.5 ppm;
- 17% (30) had a DON concentration between 0.5 and 2.0 ppm;
- 14% (25) had a DON concentration of 2.0 ppm or greater

While visual mould symptoms were apparent in some samples, they were much less pronounced than the 2016 survey, and more in line with what is observed most years. Vomitoxin analysis revealed DON concentrations lower than 2016, although incidences of elevated DON concentrations were still slightly higher than the long term average (Table 1). While 86% of samples tested below 2 ppm, it is important to remember that growers should remain vigilant and be aware of management options in those fields with higher ear mould and DON concentrations. It is important to note that a portion of the fields (5) which had DON levels >2ppm were included in the survey because the growers had observed ear rots and were concerned. A map showing the distribution of samples and their corresponding DON levels is presented in Figure 1.

Table 1. Vomitoxin (DON) results from the past 7 OMAFRA vomitoxin surveys.

DON Concentration	2011	2012	2013	2014	2015	2016	2017
< 0.50 ppm	75%	85%	84%	66%	75%	48%	69%
0.50 to <2.00 ppm		11%	14%	25%	20%	26%	17%
≥ 2.00 ppm	24%	4%	2%	9%	5%	26%	14%

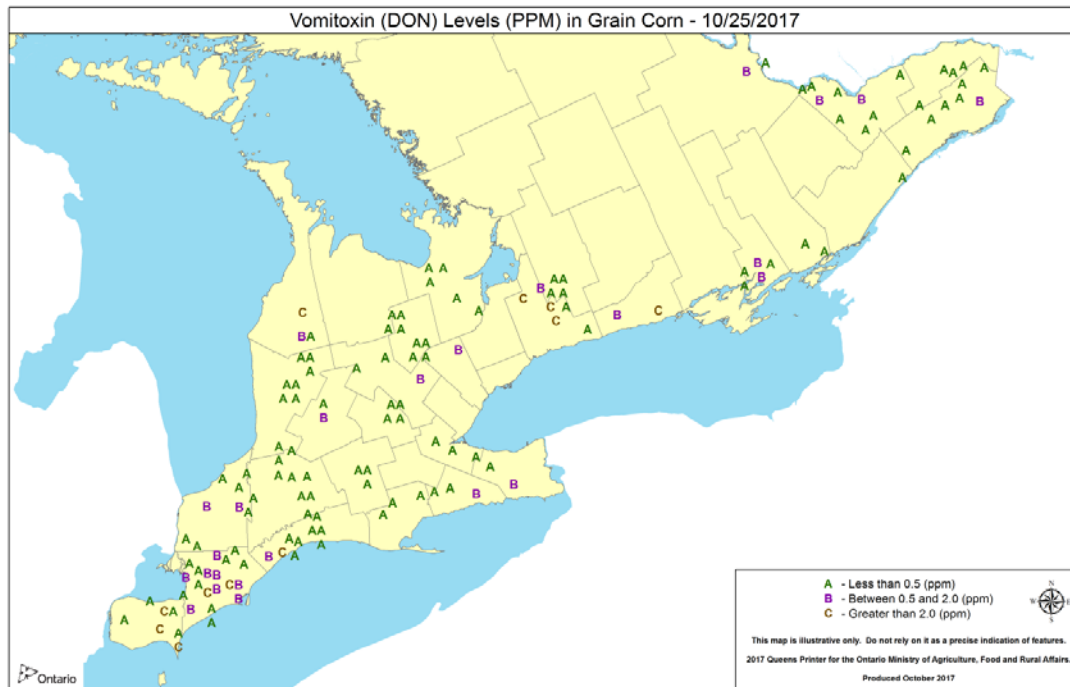


Figure 1. Ontario corn ear mould and vomitoxin (DON) survey sampling sites and DON analysis levels in 2017.

Feeding Damage

Ear feeding by pests, particularly Western Bean Cutworm (WBC), and in a few cases, birds, presented an opportunity for greater mould infestation in some samples. In other samples with light WBC feeding, mould and vomitoxin appeared relatively low to non-existent, suggesting that while ear damage may predispose risk, increased mould or vomitoxin levels were not a certainty. Visual mould and elevated vomitoxin levels were also observed in samples with little or no feeding injury. WBC damage also seemed more apparent in areas which may not have traditionally received high WBC pressure, such as central Ontario. Growers in these areas may need to start monitoring WBC in the future.

Going Forwards:

This survey does not fully capture all regions of the province, and results can vary locally from field to field depending on hybrid, planting date, insect feeding or fungicide practices. These results may not fully capture what is occurring in your fields, and therefore monitoring is recommended. Timely harvest is important. Leaving diseased grain in the field allows the ear rot fungi to keep growing, which will increase the risk of mouldy grain and mycotoxin contamination.

If a field contains a significant level of ear mould, collect a representative sample prior to harvest and have it tested for mycotoxins before storing the grain or feeding it to livestock. If necessary segregate the harvested grain from your other corn. A lab test is often the only reliable way to definitively determine mycotoxin presence and levels.

When ear rots are present, the following harvest, storage and feeding precautions are advisable (Adapted from OMAFRA Pub 811, *Agronomy Guide for Field Crops*):

- Harvest as early as possible especially susceptible hybrids.
- If insect or bird damage is evident, harvest outside damaged rows separately. Keep and handle the grain from these rows separately.
- Adjust harvest equipment to minimize damage to corn, and to remove smaller end kernels or those that have been damaged from mould or insect feeding. Clean corn thoroughly to remove pieces of cob, small kernels and red dog.
- Clean bins before storing new grain and cool the grain after drying. If possible, segregate corn based on vomitoxin content to help match end use.
- Check stored grain often for temperature, wet spots, insects and mould growth.
- Exercise caution when handling or feeding mouldy corn to livestock, especially to hogs. Pink or reddish moulds are particularly harmful. Test suspect samples for toxins. Work with a nutritionist to manage vomitoxin levels in feed.

Preventing ear rots and mould can be difficult since weather conditions are critical to disease development, so a few things to consider for 2018. Hybrid selection is important but remember although some tolerant hybrids are available, none have complete resistance. Crop rotation can reduce the incidence of ear rots, while several foliar fungicides aimed at suppressing ear rots have also been registered. Cultural practices such as tillage have been shown to have limited success in preventing ear and kernel rots.

Summary:

OMAFRA field crop staff with the assistance from members of the Ontario Agri-Business Association (OABA) completed the annual Provincial corn ear mould and mycotoxin survey in 2017. The purpose of the annual survey is to assess grower and industry risk. From October 7th to 19th, a total of 179 corn ear samples were collected from across the province. Five consecutive ears were pulled from four random locations throughout a field, dried, shelled and submitted for DON vomitoxin analysis. Of the 179 samples collected, 69% had DON concentration less than 0.5 ppm, 17% had DON concentration between 0.5 and 2.0 ppm and 14% had DON concentration of 2.0 ppm or greater. These values are in line with long term averages, and thus no significant issues with the 2017 corn crop are expected.

Acknowledgements:

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