



Is deoxynivalenol contamination a serious problem for oat in eastern Canada?

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Summary:

The fungal disease Fusarium Head Blight is caused by certain species of *Fusarium* which produce a phytotoxin called deoxynivalenol (DON). Deoxynivalenol contamination can seriously limit wheat and barley production in eastern Canada, but this may not be true for oat. To test this, 3243 oat grain samples taken from 160 oat genotypes tested in 87 year–location combinations in Quebec and Atlantic Canada oat trials from 2008 to 2015 were tested for deoxynivalenol concentrations. It was found that there are repeatable genetic differences in deoxynivalenol contamination. Relatively resistant cultivars (e.g., ‘CDC Dancer’) were identified, as were susceptible cultivars (e.g., ‘AC Rigodon’). Genotypes better than CDC Dancer or worse than AC Rigodon were also identified. The existence of these genetic differences makes it possible to select for more resistant cultivars. It was also noted that cultivars with greater groat percentage (thinner hulls) had less deoxynivalenol contamination. This means that it should also be possible to select for oat cultivars less likely to become contaminated by selecting for less hull and more groat, a trait that is already desired by the milling oat industry. Lastly, oat grain produced in Quebec and the Maritimes generally fell into the category of safe for use as feed or food, having deoxynivalenol contamination levels below permissible limits in Canada. The EU limit, however, is stricter than in Canada, and, in about 16% of the trials, the grain would not have been suitable for making infant food in Europe. Using a resistant cultivar such as CDC Dancer can reduce this risk to 10%, while using a susceptible cultivar such as AC Rigodon can increase the risk to 21%. Breeding for Fusarium head blight resistance, as measured by less deoxynivalenol contamination, is possible and should be a component in oat breeding for the region.