

Development of a Manitoba Soils Test for Cadmium

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At the Morden Research Station, Agriculture and Agri-Food Canada (AAFC) researchers are examining the relationship between the amount of cadmium in Manitoba soil and in the soybean seed it produces. As part of this research, soybean fields are tested in the area from Carman south to the border and the Manitoba Escarpment east to the Red River. Results will be used to develop a cadmium soil test to ensure the continued production of safe, high quality, nutritious and marketable soybeans for Canadians.

Some countries, including Canada, have placed limits on the amount of cadmium in grain. Cadmium can be taken up by crops and, when consumed in high amounts over a long time, can accumulate in the body and have been linked to several diseases.

In the mid 90s, Durum wheat with as little as 100 parts per billion was turned away by European nations, reducing Canadian exports. Now, all new durum wheat varieties registered in Canada must be low cadmium accumulators.

Trade regulations established by the World Health Organization (CODEX Alimentarius, 2008) set a maximum of 200 parts per billion for soybeans, grains and pulses traded internationally. The European Union and China have already imposed import limits on the amount of cadmium that food soybeans can contain.

In order for Manitoba to develop a market for safe, food quality soybeans, the amount of cadmium in the seed must not exceed Canada's and the international standards.

Preliminary work has shown that there is a relationship between the amount of cadmium in the soil and in soybean seed. It is time to take the soils test from the research station to the farmer's field.

Many crops that are grown in Manitoba can take-up cadmium,



including soybean. The silty soils, formed at the bottom of ancient lakes or seas, which are common in Manitoba, have more available cadmium than clay soils.

The Manitoba Pulse Growers Association, AAFC and CGC have sponsored research examining the relationship between the amount of cadmium in the soil and in soybean seed. Mark Sandercock, from the Morden Research Station, has sampled soil and seed from fifty fields in an area from Carman south to the border and the Manitoba Escarpment east to the Red River. The soil and seed samples that were collected this summer (2011) will be analysed for their cadmium content. This is just a random snapshot of farms from this area, but it will show how much cadmium varies across a field and whether the seed is approaching health and international export limits.

The goal of this research is to develop a cadmium soil test that farmers can use to decide which varieties to grow. On a soil high in cadmium, for example, farmers can choose to grow a low cadmium accumulating variety. The test will also improve the understanding of the variability of cadmium in a field and across the region.

This proactive research will add value to the work of AAFC's soybean breeding program, which is increasing the number of low cadmium accumulating food grade varieties available for farmers. Of the Canadian soybean varieties tested so far, approximately 30% of them are genetically low accumulating types.

If you live in the sampling area and are interested in joining the research team by having your fields and soybean seed tested, please contact Mark Sandercock at the Morden Research Station, at msandercock@agr.gc.ca or (204) 822-7260.