

Testing Pedigreed Seed for GM Flax Presence

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By Dale Adolphe
Executive Director
Canadian Seed Growers' Association

Background:

Positive tests for the low level presence of GM flax in commercial flax shipments from Canada were found after mid-summer testing in Europe. Only one GM flax trait and only one variety with this trait, CDC Triffid, has ever been registered and produced in Canada. Seed of this variety was produced in the mid to late 1990's. No production of pedigreed seed was undertaken for this variety after the 1999 production year. Stocks of pedigreed seed of CDC Triffid were the subject of a voluntary industry recall in 1998 – 2000. The variety was de-registered in 2001.

Because the GM trait in CDC Triffid had not undergone safety assessments required in Europe, Europe's default position of no tolerance for positive detection is in effect. During 2009, testing on Canadian flax shipments was performed based on 4 representative samples of 60 grams each (240 grams in total or approximately 40,000 seeds) in order to achieve some confidence in the detection to a level of 0.01% or 1 seed in 10,000. Duplicated testing of flax samples in Canada confirmed the findings. The testing conducted in Canada is also confirming 1) the presence of GM flax is at very low levels – almost totally below 0.1% or 1 seed in 1,000 and 2) the low level presence is being found across and throughout Canada's flax growing and handling system.

Flax seed Certification in Canada:

Flax in Canada is subject to CFIA variety registration requirements and, for all intents and purposes, a flax variety must be registered to enter the Canadian seed certification system (exceptions relate to the use of unregistered varieties for research purposes, seed multiplication in anticipation of variety registration, or for own use by the importer). Only pedigreed flax seed and varieties that have been produced within Canada's seed certification system can be sold as seed by its variety name.

Canada's seed certification system for flax involves a number of generations between the time when a recognized plant breeder develops and registers the variety and when the variety is first made available to commercial farmers in the form of Certified seed. These generations include Breeder seed production (produced by a CSGA recognized plant breeder), Select seed production (produced by CSGA accredited plot growers) and Foundation, Registered and Certified seed production (produced by CSGA member seed growers).

To have a flax variety registered in Canada and enter the Canadian pedigreed seed system, the plant breeder must be recognized by CSGA. This recognition takes the form of a peer review of plant breeding qualifications held by the applicant. Years of experience and education as well as references are utilized to undertake the peer review.

For a seed grower to produce seed plots of any crop kind, the seed grower must go through a three year probationary period during which the field size is restricted to a maximum 1.25 acre plot. Once accredited as a plot producer, the accredited plot producer can produce seed plots of any crop kind in plots up to 2.5 acres in size.

Once the generation of flax seed passes beyond the Select generation to Foundation, Registered, or Certified, there are no acreage restrictions. Seed growers producing these lower generation flax seed crops must, however, have an independent, third party (CFIA) inspection of the seed crop to verify that it meets, or exceeds, the minimum seed production standards outlined in CSGA's *Regulations for Production of*

Pedigreed Seed Crops (Circular 6). The seed harvested from the inspected crop must meet federal Seed Regulations' purity and germinations standards for the pedigreed seed grade being assigned to the seed lot. This involves the seed being conditioned in a CFIA registered seed establishment, being tested in a CFIA accredited laboratory and sampled and graded by a CFIA accredited grader.

Positive tests for the presence of GM flax, if found in Canada's pedigreed flax seed production, would be considered as an indication of the presence of an off-type or other variety. The pedigreed seed standards used in Canada to audit the integrity of the seed certification system provide for a threshold for other varieties of the same crop kind. At the Select and Foundation level, the standard is 0.05%. At the Registered level, the standard is 0.1%. At the Certified seed level, the standard is 0.2%. Generally speaking, these seed standards are met through the seed grower meeting the field crop production standards and grading standards outlined for flax seed crops – in CSGA's Circular 6 in the case of seed crop production standards and in the federal Seeds Regulation Grade Tables in the case of purity and germination.

To provide greater confidence that the system of field inspection, conditioning, grading and analysis for purity and germination is achieving the audit standards, CFIA conducts pedigreed seed variety verification tests. These tests, or audits, involve the collection of samples for CFIA analysis (a combination of laboratory and field grow-out tests). At the higher generations of pedigreed seed (Select in the case of flax), submission of these samples for varietal purity analysis is mandatory. At the lower generation levels of pedigreed seed production, these samples are taken on a random basis and, if deemed necessary, on a targeted basis if there is reason to target a certain variety, seed grower, or Registered Seed Establishment.

How Seed Certification can Co-operate with Canada's Flax Industry:

Given the brief explanation on the background to the issue being faced as well as a brief description of seed certification on flax seed in Canada, there are two critical control points the Canadian seed certification system can address to support the Canadian flax industry. These two critical control points each represent a starting point. The one starting point is Breeder seed – the seed entering the seed certification production system and sown by seed growers. The second starting point is Certified seed – the seed entering commercial flax production and sown by commercial farmers.

Concentration of efforts at these two critical control points accomplishes the immediate generation of "need to know" information. Does the seed entering the seed certification system contain GM flax? Does the Certified seed entering commercial production contain GM flax? If Breeder seed entering the seed certification system does not contain GM flax but Certified seed does, we would then need to address the intermediate generations. Capacity already exists within CSGA to trace back from Certified seed crops through the multiplication generations, to identify potential sources of GM flax. That type of traceability, however, only becomes important once it is shown the problem exists somewhere in the intermediate generations.

The basic elements of a protocol for testing at the two critical control points are:

1. Flax seed samples will be drawn by following Canadian Seed Institute (CSI) sampling procedures. Those procedures and a list of Canadian Grain Commission recognized GM flax testing laboratories can be found at <http://www.flaxcouncil.ca/english/index.jsp>.
2. A flax industry protocol for procedures to follow in the sampling and testing of pedigreed flax seed has also been developed and is available on the Flax Council web site. It involves sampling at two stages. One is a hand cleaned sample before conditioning and one is after conditioning. The intent of the first sample is to avoid conditioning costs if the seed tests positive. For the second stage of GM flax testing, pedigreed seed samples must be conditioned prior to submission. Samples should be drawn following the sampling protocol outlined on the Flax Council web site.

(Registered Seed Establishments may wish to simply increase the amount of seed taken for a grading sample as the frequency of that sub-sampling exceeds the flax industry protocol).

3. The size of the sample to be submitted is two (2) kilograms. To provide additional confidence that the GM flax test results are a reflection of the seed lot and to reduce the risk to you of losing a large seed lot to a positive test result, you may wish to draw samples on the basis of maximum 10 tonne seed lot sizes. The protocol calls for a maximum seed lot size but your actual seed lot size may be smaller depending upon your bin space to store lots separately.
4. It can be expected this protocol will remain in effect beyond 2010 and subject to an annual review with the commercial flax industry and international customers.

Next Steps:

1. Get Breeder seed samples tested for the presence of GM flax.
 - a. If you receive positive results for GM flax presence, that Breeder seed stock should be destroyed, or disposed of through commercial markets that can be identity preserved and isolated from the main stream flax handling industry.
2. Get Certified seed lots tested for GM flax presence before being sealed.
 - a. If you receive positive results for GM flax presence, that Certified seed stock should be disposed of through commercial markets that can be identity preserved and isolated from the main stream flax handling industry.
3. Have your Select, Foundation and Registered seed stocks tested for GM flax presence before further multiplication of the seed stocks occurs.
 - a. Contact your distributor, or the plant breeder/developer of the variety, to determine if any positive tests have been obtained at the Breeder seed level.
 - i. If the Breeder seed stock has tested positive for GM flax presence, developers and distributors may decide the seed stock of that variety will be removed from the seed certification system.
 - ii. If the Breeder seed has tested negative for the presence of GM flax, you should still consider having your high generation seed stock tested to provide the due diligence for you to have a comfort level that your 2010 multiplication is going to yield you flax seed that can meet the current market requirement for absence of GM flax.

What to do if the tests are positive for GM flax presence:

Whether a plant breeder, distributor, Select seed grower, or a seed grower producing Registered and/or Certified seed, you should isolate your seed stocks and identify a market outlet for the seed stocks – an outlet that does not involve either further seed multiplication or delivery into the E.U. destined export grain handling system. Contact a grain industry flax company to have them channel your inventory into markets not sensitive to low level presence of GM flax. If seed stocks that test positive for the presence of GM flax are not isolated and removed from the system, we are not going to be able to resolve the problem in the shortest time period possible.

CSGA will co-operate with you if you receive positive test results for GM flax. We will assist you, from our database and records, to trace, the pedigree of your seed stock to identify the potential upstream source of the GM flax and/or identify the downstream recipients of seed potentially containing low level presence of GM flax. The form used to submit samples for testing will be asking for your permission to release the test results, on a fully confidential basis to the Flax Council. The flax industry does need you to make us aware of positive tests results so the test results can be confirmed and appropriate remedial actions taken across the industry.