

Soybean Green Seed and Pulse Seed Quality

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The 2017 Saskatchewan soybean harvest yielded a few surprises for growers. Reports of soft and/or green soybean seed had growers and buyers concerned about seed quality. Typically, green soybean seed is caused by frost on immature soybeans, however in 2017, green seed appears to have been caused by the rapid drydown of the soybean crop during the very dry summer and fall.

Dennis Lange, Pulse Specialist with Manitoba Agriculture saw similar problems in Manitoba. Early into the soybean harvest, there were some issues with immature green seed in the sample, however, the green seeds observed were different than green seed caused by frost, which is a downgrading factor.

Green Seed Coat Versus Frost

To determine whether green seed is caused by frost, the Canadian Grain Commission's (CGC) protocol is to cut the seed in half. Frost-damaged soybeans, when cut in cross-section, have cotyledons that are green or greenish-brown with a glassy, wax-like appearance.

However, as was the case for much of the green soybean seed in 2017, only the seed coat was green. The CGC grading information indicates that seeds whose cotyledon are yellow, or have just a halo of green around the outside of the cotyledon, are considered sound, even if they are superficially affected by weathering. Soybeans that are green in appearance and have no discolouration of the cotyledon, or just a halo of green around the outside of the cotyledon, are to be assessed against the overall colour of the sample, and are not to be graded lower than *Soybeans, No.2 Canada Yellow*.

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Managing Green Seed Coat

In Manitoba, rainfall helped to clear the green seedcoat on soybeans in the field. Rain re-wets the seed and the entire crop then dries down more uniformly, resulting in normal seedcoat colour.

Storage also helps. When put in storage, the green seedcoat matures, and the color turns to that of a mature soybean. After several weeks to a month of storage, most of the seeds with green seedcoats will have turned colour.

When to Harvest

In 2017, some soybean growers waited for the green seedcoats to turn color in the field, resulting in very dry seed. Seed damage is high when soybeans are harvested at less than 12 per cent moisture, and harvest losses can also be high under dry conditions.

Whether to harvest soybeans with soft/green seedcoats depends on the overall percentage of green seed. If less than two per cent of seed has green seedcoats, then harvesting could proceed as normal since the seedcoats will turn colour in storage.

However, if more than three per cent of the sample has green seedcoats and rainfall is in the forecast, a good strategy would be to wait for rainfall to re-wet the seed and allow natural ripening to uniformly clear the green colour. This is a strategy often used by seed growers. An additional caution is that if the crop is harvested with a high percentage of green seed, smearing of the green seed may occur.



2017 soybean seed sample at harvest illustrating the green seed coat on seed in the sample.

Canadian Grain Commission Soybean Grading Factors

Soybeans can be downgraded if the sample has damaged seed. Damaged soybeans include those which are sprouted, frost-damaged, shriveled, ground-damaged, insect damaged, immature, or otherwise unsound. For example, No. 1 Canada soybean tolerates two per cent damaged seed.

Seeds where the inside cotyledon is green, fall into the category of Immature. Immature, damaged soybeans are characterized by a green exterior appearance in conjunction with green discolouration penetrating the cotyledon. Examination of the cotyledons is determined by cutting the soybeans in cross-section. For grading purposes, immature, damaged soybeans are considered as part of the "Total Damage" grade specification.