Alfalfa – Certified Production of Hybrid Alfalfa

The requirements shown here are specifically for Certified production of Hybrid Alfalfa including all varieties of Hybrid Alfalfa (*Medicago sativa*) but not interspecific hybrids of *Medicago sativa* and *Medicago falcata*. **Open-pollinated Alfalfa** is not included and can be found under its own heading.

General Requirements for All Pedigreed Seed Crops

The basic standards for all crops are set out in General Requirements for All Pedigreed Seed Crops. In addition, the following standards apply to Hybrid Alfalfa.

Classes and Generations

The number of official pedigreed classes is determined by the Breeder of the variety and either Select Synthetic or Foundation status parental material is normally planted to maintain male sterile parent material and to produce Certified hybrid crops.

Currently in Canada, Hybrid Alfalfa production involves the blending of parental seed lines in specific ratios. Select Synthetic or Foundation seed of male and female lines are blended in a specific proportion under the supervision of the plant breeder. The ratio of male sterile and either maintainer line or male fertile line must not be more than 2:1.

Land Requirements

Inspected Crop	Must NOT be grown on land which:
Certified	In any of the 2 years prior to the year of seeding produced**:** • a non-pedigreed crop of Alfalfa. • a different variety of Alfalfa.

Crop Inspection

Hybrid Alfalfa crops must be inspected during the bloom stage, after 75% of the plants are showing one or more blossoms but before most seed has set. At the time of crop inspection, the Pollen Production Index (PPI) of the male sterile (female) parent must be determined as explained in the Specific Requirements.

Age of Stand

The maximum number of years pedigreed seed can be produced from a stand of Hybrid Alfalfa established with parent seed is 8 years.

Crop Standards

Isolation

The isolation must be reasonably free from plants that may cross pollinate with the inspected crop. The risk to varietal purity posed by plants that may cross pollinate varies depending on area, density, stage of maturity and distance from the inspected crop. These factors will be taken into consideration in determining the pedigreed status of the inspected crop.

Minimum Isolation Distances Required from an Inspected Crop to Other Crops:

1. Varietal Purity

a. Hybrid Alfalfa female parent crops for Foundation status must be isolated by a distance of 400 meters (1312 feet) from other varieties of Alfalfa or from a non-pedigreed crop of Hybrid Alfalfa.
b. Hybrid Alfalfa crops for Certified status, or male parent crops for Foundation status, must be isolated by a distance of 50 meters (165 feet) from other varieties of Alfalfa or from a non-pedigreed crop of Hybrid Alfalfa.
c. In producing either Foundation parent material or Certified hybrid crops of the same variety, at least 3 meters (10 feet) of isolation is required between crops.

Border Removal in Lieu of Isolation for Certified Crops of Hybrid Alfalfa:

For a Certified seed crop, 50 meters (164 feet) is normally required from the edge of the inspected crop to adjacent contaminating pollen sources including crops of different varieties or a non-pedigreed crop of Hybrid Alfalfa. However, isolation requirements are based on the size of the Certified crop and the percentage of the crop within 50 meters of a contaminating pollen source (see demonstration of the 10% rule).

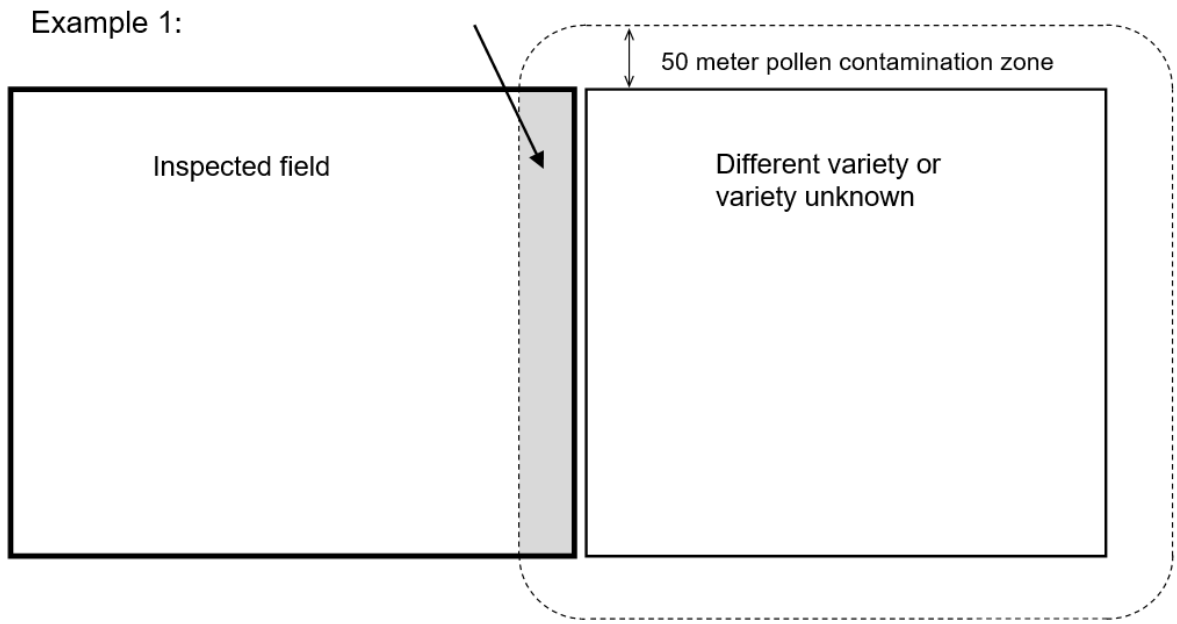
If the calculated area makes up more than 10% of the total inspected area of the seed crop, then border removal in lieu of isolation will be required so that the area harvested for seed is at least 50 meters from all contaminating pollen sources. Borders must be allowed to shed pollen before being discarded.

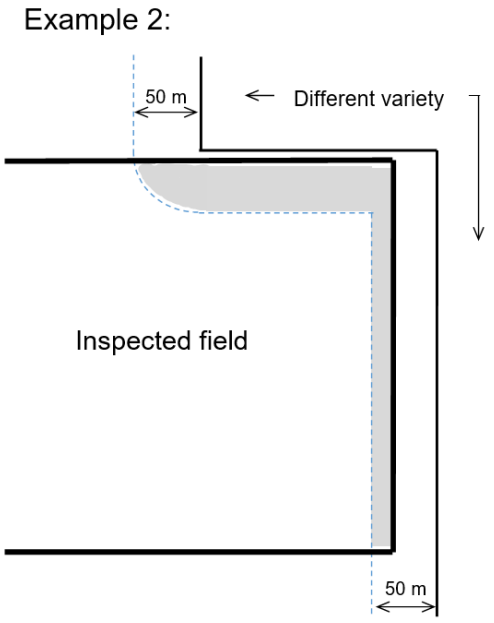
Even if each contaminating pollen source is separately affecting less than 10% of the seed field, the isolation correction/s will be required if, when combined, the sum total of all areas being affected is more than 10% of the entire seed field. For example, isolation correction is required if 6% of the west side of the field, and 5% of the south side of the field are within 50 meters of a different variety. Although each source of contamination is affecting less than 10% of the field, 11% (6+5) of the field is being affected in total so all sides affected will need to be corrected. Using this same example, if the west side of the field is 4 meters and the south side is 5 meters from a different variety, a border of 46 meters on the west side and 45 meters on the south side would need to be removed after pollen shed.

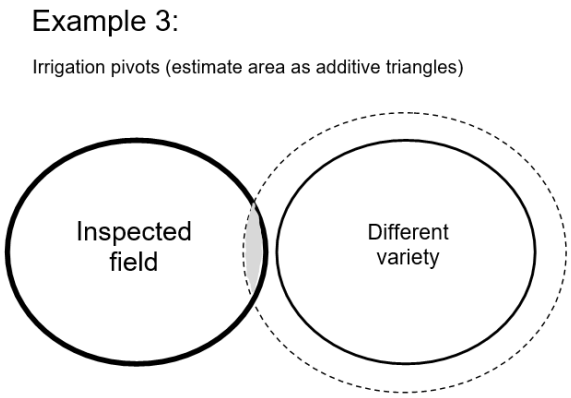
If the calculated area makes up 10% or less of the total inspected area of the seed crop, no border removal will be required provided there are at least 3 meters of isolation. A 3 meter isolation strip is always required between the inspected crop and adjacent contaminating pollen sources to prevent accidental harvest of the contaminating pollen source.

Demonstration of the 10% rule for Certified Crops of Hybrid Alfalfa

The pollen contamination zone (**shaded area**) within the inspected field must not comprise more than 10 percent of the inspected seed crop area.







Maximum Impurity Standards

1. Varietal Purity (off-types or other varieties on average in 1000 plants)
    a. Foundation – 1 plant/1,000 plants
    b. Certified – 1 plant/1,000 plants

Specific Requirements

Pollen Production Index

During crop inspection, at the bloom stage after 75% of the plants are showing one or more blossoms but before most seed has set, the Pollen Production Index (PPI) of the male sterile (female) parent must be determined. This is done by examining untripped flowers on 200 plants. Plants must be sampled in a manner that is representative of the crop and inspectors classify each of the 200 plants as:

Male Sterile (MS) – no pollen
Partially Male Sterile (PMS) – trace amounts of pollen
Partially Fertile (PF) – substantially less than normal amount of pollen
Fertile (F) – normal pollen

To determine the PPI, the number of plants in each class of fertility must be multiplied by a factor, the results of all classes are added together and divided by the total number of plants examined to come up with the PPI value for the crop. The factors are as follows:

MS multiply the number of plants by 0
PMS multiply the number of plants by 0.1
PF multiply the number of plants by 0.6
F multiply the number of plants by 1

The maximum allowable PPI for a Foundation crop would be 0.14. For crops with separate male and female plants, the maximum allowable PPI for a Certified crop with a 95% hybridity standard is 0.06 and the maximum allowable PPI for a Certified crop with a 75% hybridity standard is 0.42. For composite crops of male and female plants, the maximum allowable PPI for a Certified crop with a 75% hybridity is 0.25.

If less than 68% of the plants are male sterile, then no further examinations are required because the crop will not meet CSGA requirements. If more than 80% of the plants are male sterile, no further examinations are required because the crop will clearly meet CSGA requirements. If between 68% and 80% of the plants are male sterile, then another 100 plants shall be sampled and included in the calculation.

Inspected Crop	Parent Seed Planted	Maximum PPI Index
Foundation	(A)* in rows	0.14
Certified – separate female and male		
95% hybrid	(A)* x (B)* in rows	0.06
75% hybrid	(A)* x (B)* in rows	0.42
Certified – composite of female and male		
75% hybrid	((A)* x (B)*) + (C)*	0.25

*Parent Seed Identity