
SECTION 14.4

PRODUCTION OF HYBRID ALFALFA

In this Section:

- **Hybrid Alfalfa** includes all varieties of Hybrid Alfalfa (*Medicago sativa*) but not interspecific hybrids of *Medicago sativa* and *Medicago falcata*.

Section 1, *Regulations for All Pedigreed Seed Crops*, together with the following, constitute the production regulations.

14.4.1 SEED CLASSES AND GENERATIONS

- 14.4.1.1 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 shall not be more than 2:1.

14.4.2 LAND REQUIREMENTS

- 14.4.2.1 Hybrid Alfalfa crops must not be grown on land which in the previous two (2) years grew a non-pedigreed crop of Alfalfa or a different variety of Alfalfa.

14.4.3 CROP INSPECTION

The basic standards for all crops are set out in Section 1.7. In addition, the following apply to crops in this section:

- 14.4.3.1 It is the grower's responsibility to ensure that crops are inspected by an authorized inspector prior to swathing or harvesting.
- 14.4.3.2 A crop that is cut, swathed or harvested prior to crop inspection is not eligible for pedigree.
- 14.4.3.3 The crop must be inspected at a stage of growth when varietal purity is best determined. Crops not inspected at the proper stage for best determining varietal purity may be cause for declining pedigreed status.
- 14.4.3.4 A crop inspection shall be made 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 in Section 14.4.5.1.

14.4.4 AGE OF STAND

14.4.4.1 The pedigreed class of the seed crop will vary by crop species, the number of classes designated by the Breeder or the authorized agent of the Breeder and the Age of Stand.

14.4.4.2 Additional limitations on Age of Stand through which a variety may be multiplied outside the region of adaptation may be specified by the Breeder or the authorized agent of the Breeder.

14.4.4.3 For most perennial crops there is a specified number of years during which pedigreed seed may be harvested from one planting.

14.4.4.4 Calculating Age of Stand

- a) If rejuvenation is used as a management practice, it will count as a year of production in calculating the Age of Stand.
- b) For calculating Age of Stand, the first seed crop is the first year in which a seed crop could normally be harvested, irrespective of time or method of planting.
- c) Each calendar year thereafter will be considered a seed crop year. For example: Alfalfa sown without a companion crop in the fall is normally considered capable of seed production the following year. Alfalfa seeded with pedigreed seed of Winter Wheat as a companion crop in the fall will be considered for the first year of seed production in the second year after planting.

14.4.5 CROP STANDARDS

14.4.5.1 Isolation

- 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 metres (10 feet) isolation is required between crops.
- d) The required isolation must be provided prior to the time of flowering and crop inspection.

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

- a) For a Certified crop, 50 meters (165 feet) is normally required from the edge of the seed field to the nearest contaminating pollen source.
- b) Contaminating sources of pollen include: a crop of a different variety of Alfalfa; a crop sown with commercial Alfalfa seed; or a crop of Alfalfa where the seed sown cannot be verified as being pedigreed seed.
- c) If crop area is more than 5 acres and the isolation distance provided is less than 50 meters (165 feet), then the area of the seed crop to be discarded is determined by the procedure outlined in Chart 14.4.5.2 (next page) "Procedure for Determining Area of Alfalfa Seed Crop to be Discarded."

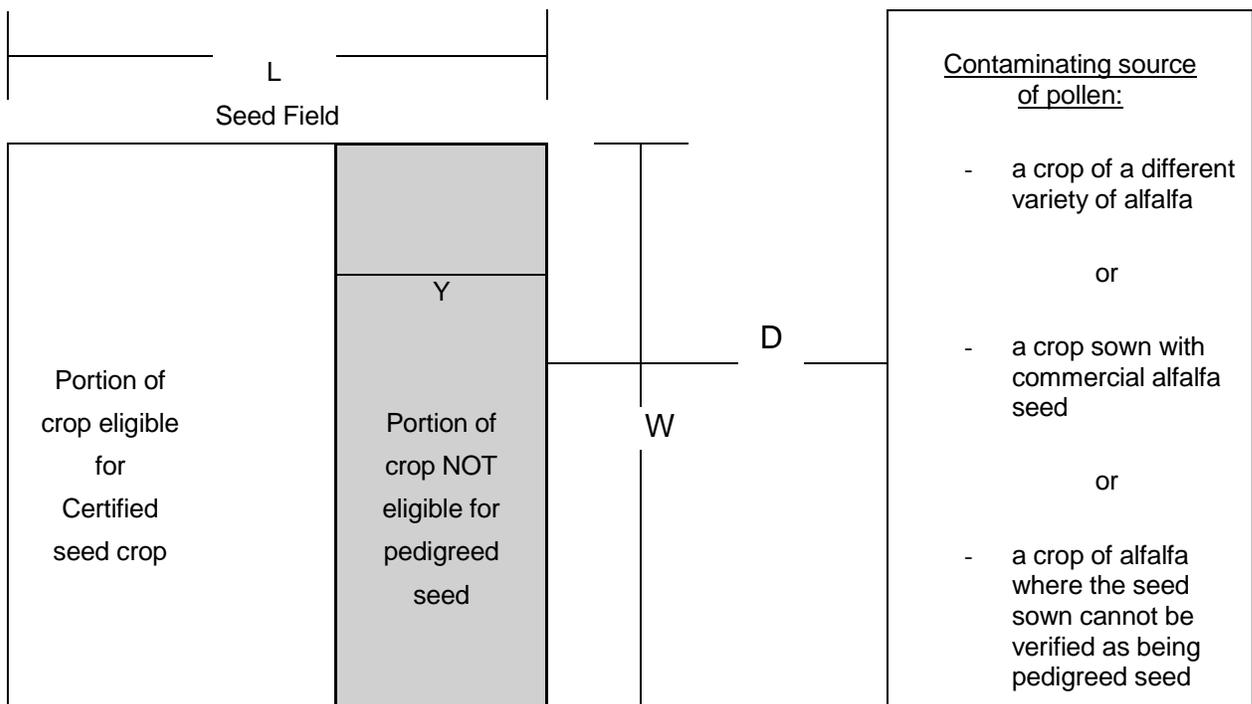
Chart 14.4.5.2:**PROCEDURE FOR DETERMINING AREA OF ALFALFA SEED CROP TO BE DISCARDED**

L = length of seed field	W = width of seed field
Y = 50 meters minus D	L x W = total area of seed field
D = Distance	
W x Y = zone which may not be eligible for pedigree	

Example:

If L = 200 meters; W = 40 meters; D = 30 meters and Y = (50 - D) = 170 meters.

Calculation of ineligible area: W x Y (40 x 20) = 800; W x L = (40 x 200) = 8,000



If 10% or less of the Certified field is within the 50 meters (165 ft.) isolation zone ($W \times Y$), then 3 meters (10 ft.) of isolation is required. If more than 10% of the field is within the isolation zone ($W \times Y$), that part of the field must not be harvested as Certified seed. The isolation zone is that area calculated by multiplying the length (L) of the seed field by the average width (W) of the seed field falling within the 50 meters (165 ft.) isolation distance requirements, then a clear line of demarcation shall be established between the Certified and non-Certified portion of the field.

14.4.5.3 Weeds

- All crops for pedigree must be free of Prohibited noxious weeds.
- All crops for pedigree should be free of Primary noxious weeds.
- Very weedy crops may be declined pedigreed status.

14.4.5.4 Maximum Impurity Standards

The maximum impurity levels outlined in Table 14.4.5.4 apply, unless variants are specified by the responsible Breeder.

Table 14.4.5.4: Maximum Impurity Standards

Impurity	Maximum Permitted	
	Foundation	Certified
Other varieties of Alfalfa	1 per 1,000 plants	1 per 1,000 plants

14.4.6 SPECIFIC REQUIREMENTS**14.4.6.1 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 amount 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 all classes are added together and divided by the total number of plants examined to come up with a Pollen Production Index (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

As outlined in Table 14.4.6.1 below, the maximum allowable Pollen Production Index (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 standard 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.

Table 14.4.6.1: Maximum Pollen Production Index (PPI)

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
	composite of female and male	
75% hybrid	$((A)^* \times (B)^*) + (C)^*$	0.25

* Parent Seed Identity

