SECTION 13

PROBATION AND FOUNDATION PLOT PRODUCTION OF CANOLA, MUSTARD, RADISH, RAPESEED, SAFFLOWER, AND SUNFLOWER

In this Section:

- ***Canola*** and ***Rapeseed*** includes spring and winter varieties of *Brassica napus, Brassica rapa*, and canola-quality *Brassica juncea,* except when otherwise indicated.
- ***Mustard*** includes varieties of Brown or Oriental types (*Brassica juncea*), White/Yellow types (*Sinapis alba*) and Ethiopian types (*Brassica carinata)*.
- ***Radish*** includes varieties of *Raphanus sativus.*

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

13.1 SEED CLASSES, GENERATIONS, DEFINITIONS AND TYPES

13.1.1 **Seed Classes**

a) Breeder: determined by the Breeder.
b) Foundation: one generation, grown by accredited Foundation plot growers.
c) Certified: one generation. Refer to Section 4.
d) For Certified Hybrid Canola and Rapeseed production, refer to Section 5.

13.1.2 For growers not accredited by the CSGA to grow Foundation plots and who plant crops with Breeder seed, the CSGA reserves the right to determine the status of the inspected crop and may issue a Certified crop certificate.

13.1.3 **Definitions**

a) Parent line or population: a relatively true breeding strain or selection used for seed crop production.
b) Inbred line: a relatively true breeding homozygous strain.
c) A line: line or population which is male sterile.
d) B line: male fertile line or population capable of maintaining male sterility.
e) Restorer line: line or population used as male parent which has the capability of restoring fertility to male sterile lines/populations when crossed onto them.
f) Self-incompatible (S.I.) line: male fertile line or population incapable of self-pollination due to self incompatibility.
g) Self-compatible (S.C.) line: male fertile line or population which is capable of self pollination.

13.1.4 **Types**

a) Single-cross hybrid: the first generation of a cross between two specified inbred lines or relatively homogeneous parent populations.
b) Foundation single-cross: a single-cross used in the production of a double-cross, a Foundation three-way cross hybrid or a top-cross hybrid.
c) Double-cross hybrid: the first generation of a cross between two Foundation single-cross hybrids.
d) Three-way cross hybrid: the first generation of a cross between an inbred parent line or parent population and a Foundation single-cross.

e) Top-cross hybrid: The first generation of a cross between an inbred parent line and an open pollinated variety.

13.2 PROBATION PLOT PRODUCTION

13.2.1 A grower wishing to produce a Foundation plot must receive permission from the CSGA before commencing Probation plot production.

13.2.2 An *Application to Commence Probation Plot Production* (Form 154) is available from the CSGA and should be submitted prior to March 31 for spring seeded crops and prior to July 31 for fall seeded crops.

13.2.3 The grower may be required to have grown Certified seed crops of the crop kind in which the grower is commencing Probation in at least 3 of the previous 5 crop years.

13.2.4 An individual seed grower must complete 3 successful years of Probation plot production in order to be granted Foundation plot grower status.
a) This status is granted to an individual seed grower only.
b) This status cannot be acquired through an affiliation with another seed grower or transferred to or from other Foundation plot growers.

13.2.5 Breeder seed, approved by the CSGA, must be sown each year.

13.2.6 Breeder seed is obtained directly from the organization responsible for the variety. (Check with the distributor for deadline dates).

13.2.7 Probationary growers of Canola and Mustard may change varieties within the crop kind which they started their probation without receiving prior permission from the CSGA.

13.2.8 The status granted to plots grown during the Probation period is as follows:
a) First Year: provided all requirements are met, the First Year plot will be granted Foundation status. Breeder seed must be obtained for the Second Year plot.
b) Second Year: provided all requirements are met, the Second Year plot will be granted Foundation status. Breeder seed must be obtained for the Third Year plot.
c) Third Year: provided all requirements are met, the Third Year plot will be granted Foundation status. The grower is now eligible to grow Foundation and Select plots.

13.2.9 Any means of processing or conditioning of seed from a Probation plot which may contaminate the varietal purity of the seed is prohibited.

13.2.10 A *Report of Plot Production* (Form 50) for each Probation plot will be sent to the grower and must be completed and submitted to the CSGA.

13.2.11 A sample of clean seed from each Probation plot must be submitted for variety verification. The sample must be representative of the seed harvested from the plot.

13.2.12 Probation plot growers may produce only one (1) plot in each year of Probation.

13.2.13 **Area of Probation Plot**

a) The area of the Foundation plot during the 3-year Probation period must not be less than 0.25 hectare (0.50 acre) nor exceed 0.5 hectare (1.25 acres).
b) When unforeseen circumstances do not permit proper maintenance of the entire plot, it is recommended that the area be reduced by destroying part of the plot or by isolating a part to meet the requirements of a lower status of pedigreed seed. The remainder must meet the requirements for Probation plot production.
c) The total area of a Probation plot includes the "walkways" provided within the plot to facilitate effective roguing.

13.2.14 Probation plots in this section are subject to all Foundation plot production requirements.

13.3 FOUNDATION PLOT PRODUCTION

13.3.1 An individual seed grower must complete 3 successful years of Probation plot production in order to be granted Foundation plot grower status.

a) This status is granted to an individual seed grower only.
b) This status cannot be acquired through an affiliation with another seed grower or transferred to or from other Foundation plot growers.

13.3.2 Plots for Foundation status must be planted with Breeder seed approved by the CSGA.

13.3.3 For Breeder seed information, growers should contact the Breeder or Canadian representative of the variety. Check with distributor for deadline dates.

13.3.4 Any means of processing or conditioning of seed from a Foundation plot, which may contaminate the varietal purity of the seed, is prohibited.

13.3.5 A *Report of Plot Production* (Form 50) for each Foundation plot will be sent to the grower and must be completed and submitted to the CSGA.

13.3.6 A sample of clean seed from each Foundation plot must be submitted for variety verification. The sample must be representative of the seed harvested from the plot.

13.3.7 **Area of Foundation Plots**

a) There is no limit on total acreage of plots, number of crop kinds, number of varieties or acreage of one variety. Each plot is limited to 1 hectare (2.5 acres) in size.
b) When unforeseen circumstances do not permit proper maintenance of the entire plot, it is recommended that the area be reduced by destroying part of the plot or by isolating a part to meet the requirements of a lower status of pedigreed seed. The remainder of the plot must meet the requirements for Foundation plot production.

13.4 LAND REQUIREMENTS

13.4.1 Crops shall not be planted on land where volunteer growth from a previous crop may cause contamination.

13.4.2 Plots for Foundation status of Canola, Mustard, Radish and Rapeseed must not be planted on land which in the previous 5 years has been planted with or produced a crop of Canola, Mustard or Radish, or Rapeseed.

13.4.3 Plots for Foundation status of Safflower and Sunflower must not be planted on land which produced a crop of the same kind in the previous year.

13.5 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.

13.5.1 It is the grower's responsibility to ensure that plots are inspected by an authorized inspector prior to swathing or harvesting.

13.5.2 A plot that is cut, swathed or harvested prior to crop inspection is not eligible for pedigree.

13.5.3 The plot 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.

13.5.4 For **Canola, Mustard, Radish** and **Rapeseed**, inspection must be made when the crop is in the early flowering stage in order to best determine varietal purity. A crop not inspected at this stage may be cause for not granting pedigreed status.

13.5.5 For **Safflower**, field inspection must be made during the bloom stage but not before at least 50 percent of the plants are showing one or more blossoms.

13.5.6 For **Sunflower**, field inspection must be made after the crop is at least 50 percent in bloom and before it is fully matured.

13.6 CROP STANDARDS

13.6.1 **Minimum Isolation Distances Required Between Foundation Plots and Other Crops**

a) This first 50 meters of isolation to other crops set out in Table 13.6.1 shall be practically free from plants that may cross pollinate with the inspected seed crop (not more than 1 plant per 100 square meters, on average) and the remaining distance reasonable free from plants that may cross pollinate with the inspected crop (not more than 1 plant per 10 square meters, on average).

b) Plants that may cross pollinate with the inspected crop within the required isolation distance, depending on density, stage of maturity, location and distance from the inspected crop, may be cause for declining pedigreed status. The species of plants that may cross pollinate with the inspected crop are identified in Table 13.8.3.

c) The required isolation must be provided prior to the time of flowering and crop inspection.

Table 13.6.1: Minimum Isolation Distances Required Between Foundation Plots and Other Crops

Foundation Plot Crop	Other Crops	Isolation Distance Required
To produce the parent seed of Hybrid Canola, Hybrid Rapeseed and synthetic/ composite varieties: **Canola** and **Rapeseed** (*B. napus, B. rapa* and canola-quality *B. juncea*), planted with Breeder seed (A, B, R, S.C. and S.I. lines)	- Different varieties of *B. napus or B. rapa* - Non-pedigreed crops of *B. napus or B. rapa*	800 meters (2624 feet) or more, as specified by the Breeder
	- Certified seed crops planted with Foundation seed of the same pollen bearing (male) parent (except S.I. lines)	3 meters (10 feet) provided the pedigree of the Foundation seed used can be established and provided the adjacent crop is free of *B. juncea* or *B. carinata* for a distance of 200 meters (656 feet) and *B. napus* or *B. rapa* for 800 meters (2624 feet) from the inspected crop including A line pollen shedders
	- Plot of the same pollen bearing (male) parent	3 meters (10 feet)
	- *B. juncea* or *B. carinata*	200 meters (656 feet), provided the adjacent crop is free of *B. napus* or *B. rapa* for a distance of 800 meters (2624 feet)
	- *S. alba* or *R. sativus*	3 meters (10 feet), provided the adjacent crop is free of *B. juncea* or *B. carinata* for a distance of 200 meters (656) feet and *B. napus* or *B. rapa* for a distance of 800 meters (2624 feet)

Table 13.6.1 (continued):
Minimum Isolation Distances Required Between Foundation Plots and Other Crops

Foundation Plot Crop	Other Crops	Isolation Distance Required
To produce the parent seed of Open-pollinated varieties: Canola and **Rapeseed** (*B. napus*, canola-quality *B. juncea*)	- Different varieties of *B. napus* or *B. rapa* - Non-pedigreed crops of *B.* napus or *B. rapa*	200 meters (656 feet)
	- Planted with Certified seed of the same variety	100 meters (328 feet), provided the pedigree of the Certified seed used can be established and the adjacent crop is free of *B. rapa* for a distance of 200 meters (656 feet)
	- *B.* juncea or *B. carinata*	100 meters (328 feet), provided the adjacent crop is free of *B.* napus or *B. rapa* for a distance of 200 meters (656 feet)
	- *S. alba* or *R.* sativa	3 meters (10 feet), provided the adjacent crop is free of *B. juncea* or *B. carinata* for a distance of 100 meters (328) feet, and *B. napus* or *B. rapa* for a distance of 200 meters (656 feet)
	- Planted with Breeder or Foundation seed of the same variety	3 meters (10 feet)

Table 13.6.1 (continued):
Minimum Isolation Distances Required Between Foundation Plots and Other Crops

Foundation Plot Crop	Other Crops	Isolation Distance Required
To produce the parent seed of Open-pollinated varieties: Canola and **Rapeseed** (*B. rapa)*	- Different varieties of *B. rapa* - Non-pedigreed crops of *B. rapa*	400 meters (1312 feet)
	- Planted with Certified seed of the same variety	100 meters (328 feet), provided the pedigree of the Certified seed used can be established
	- *B. juncea*, *B. carinata* or *B.napus*	100 meters (328 feet), provided the adjacent crop is free from plants of *B. rapa* for 400 meters (1312 feet)
	- *S. alba* or *R. sativus*	3 meters (10 feet), provided the adjacent crop is free of *B. napus*, *B. juncea*, or *B. carinata* for a distance of 100 meters (328 feet) and *B. rapa* for a distance of 400 meters (1312 feet)
	- Planted with Breeder or Foundation seed of the same variety	3 meters (10 feet)

Table 13.6.1 (continued):
Minimum Isolation Distances Required Between Foundation Plots and Other Crops

Foundation Plot Crop	Other Crops	Isolation Distance Required
Brown or Oriental Mustard and canola-quality *B. juncea* (*B. juncea*)	- Different varieties of *B. juncea* - Non-pedigreed crops of *B. juncea*	200 meters (656 feet)
	- Planted with Certified seed of the same variety	100 meters (328 feet), provided the pedigree of the Certified seed used can be established
	- *B. napus*, *B. rapa* or *B. carinata*	100 meters (328 feet), provided the adjacent crop is free of plants of *B. juncea* for 200 meters (656 feet)
	- *S. alba* or *R. sativus*	3 meters (10 feet), provided the adjacent crop is free of *B.* napus or *B. rapa* or *B. carinata* for a distance of 100 meters or from *B. juncea* for a distance of 200 meters (656 feet)
	- Planted with Breeder or Foundation seed of the same variety	3 meters (10 feet)
White/Yellow Mustard (*S. alba*)	- Different varieties of *S. alba* - Non-pedigreed crops of *S. alba*	400 meters (1312 feet)
	- Planted with Certified seed of the same variety	100 meters (328 feet), provided the pedigree of the Certified seed used can be established.
	- *B. napus*, *B. rapa*, *B. juncea* or *B. carinata*	3 meters (10 feet), provided the adjacent crop is free of plants of *S. alba* for 400 meters (1312 feet)
	- Planted with Breeder or Foundation seed of the same variety	3 meters (10 feet)
Radish (*R. sativa*)	- Different varieties of *R. sativa* - Non-pedigreed crops of *R. sativa*	400 meters (1312 feet)
	- Planted with Certified seed of the same variety	100 meters (328 feet), provided the pedigree of the Certified seed used can be established.
	- *B. napus*, *B. rapa*, *B. juncea* or *B. carinata*	3 meters (10 feet), provided the adjacent crop is free of plants of *R. sativa* for 400 meters (1312 feet)
	- Planted with Breeder or Foundation seed of the same variety	3 meters (10 feet)

Table 13.6.1 (continued):
Minimum Isolation Distances Required Between Foundation Plots and Other Crops

Foundation Plot Crop	Other Crops	Isolation Distance Required
Ethiopian Mustard (*B. carinata*)	- Different varieties of *B. carinata* - Non-pedigreed crops of *B. carinata*	200 meters (656 feet)
	- Planted with Certified seed of the same variety	100 meters (328 feet), provided the pedigree of the Certified seed used can be established and the adjacent crop is free of *B. napus, B. rapa* or *B. juncea* for a distance of 100 meters (328 feet)
	- *B. napus*, *B. rapa*, or *B. juncea*	100 meters (328 feet), provided the adjacent crop is free of *B. carinata* for a distance of 200 meters (656 feet)
	- *S. alba* or *R. sativa*	3 meters (10 feet), provided the adjacent crop is free of *B. carinata* for a distance of 200 meters (656 feet)
	- Planted with Breeder or Foundation seed of the same variety	3 meters (10 feet)
Safflower	- Different varieties of Safflower - Non-pedigreed crops of Safflower	400 meters (1312 feet)
	- Foundation or Certified crop of the same variety	3 meters (10 feet)
Sunflower	- Different varieties of Sunflower - Non-pedigreed crops of Sunflower - Wild annual Sunflower - Volunteer Sunflower plants	805 meters (2640 feet)
	- Foundation or Certified crop of the same variety	3 meters (10 feet)

13.6.2 **Border Rows**

a) Must be planted with the same seed as the pollen (male) parent rows.
b) Must be planted such that synchronous flowering occurs with pollen (male) parent rows and, more importantly, with receptive female parent plants of the inspected crop.

13.6.3 **Weeds**

a) All crops for pedigree must be free of Prohibited noxious weeds.
b) The presence of Cleavers (*Galium aparine*) in the Canola, Mustard, Radish or Rapeseed plot is cause for declining pedigreed status.
c) Very weedy plots will be declined pedigreed status.
d) Wild mustard (*Sinapis arvensis*) must not be present in the Canola, Mustard, Radish or Rapeseed plot at an average of more than 1 plant/20,000 plants.

13.6.4 **Maximum Impurity Standards**

The inspector makes 6 counts (20,000 plants each) in the plot to determine the number of impurities. The resulting average must not exceed the maximum impurity standards.

a) A Canola, Mustard, Radish or Rapeseed plot for Foundation status, unless variants are specified by the responsible Breeder, must not contain more than 1 plant in approximately 20,000 plants of species that may cross pollinate successfully with the inspected crop as identified in Table 13.8.3.
b) A Canola, Mustard, Radish or Rapeseed plot for Foundation status, must not contain more than 1 plant in approximately 20,000 plants of species with difficult to separate seeds as identified in Table 13.8.3.
c) For Safflower, the maximum standard permitted is 1 per 10,000 plants.
d) For Sunflower, the maximum standard allowed is one-half of 1 percent (0.5%) that is 1 plant per 200 plants of inspected crop, of other varieties or clearly distinguishable off-types.

13.7 RECOMMENDED PROCEDURES FOR THE PRODUCTION OF PROBATION AND FOUNDATION PLOTS

13.7.1 **Planting of Plots**

a) The plot should be planted in such a manner as to facilitate inspection, roguing and harvesting.
b) Plots should be planted in areas easily accessible for frequent maintenance and provide the maximum protection from outside sources of contamination, such as roadways and building sites.
c) Regulations for land requirements are minimum standards and caution is necessary in choosing land, as volunteer growth from previous crops may vary according to local conditions.
d) The regulations for isolation are minimum standards. It is always to the grower's advantage to provide more isolation than required.
e) When planting Probation and Foundation plots, specific requirements may influence the location and size of the plot. It is a safeguard if adjacent crops are the same variety as the plot and are inspected for pedigreed status.

13.7.2 **Roguing of Probation and Foundation Plots**

a) The plot must be thoroughly and intensively rogued many times throughout the crop season.
b) The numbers and kinds of plants removed should be recorded and described on the *Report of Plot Production* (Form 50).
c) All rogued plants must be removed from the plot area.

13.7.3 **Harvesting, Cleaning and Storing of Probation and Foundation Plots**

a) A Probation or Foundation plot grower should have access to the necessary equipment for harvesting and cleaning the seed from the plot in such a manner as to ensure that the varietal purity of the seed is maintained.
b) The seed should be stored in a clean, cool, dry area.
c) The seed containers should be labelled for identification.

13.7.4 **Probation and Foundation Plot Grower Courses**

a) Probation and Foundation plot growers are encouraged to attend courses on plot production.

13.8 SPECIFIC REQUIREMENTS

13.8.1 Probation and Foundation plot growers may be required to submit to the CSGA the results from a recognized laboratory indicating the erucic acid and/or glucosinolate content of Canola varieties. A crop certificate may be issued if the seed meets the officially recognized variety description standards.

13.8.2 In the case of canola-quality *Brassica juncea*, Probation and Foundation plot growers must submit to the CSGA the results from a recognized laboratory indicating the allyl glucosinolate level of a crop. A crop certificate may be issued if the seed meets the maximum standard of 1 micro mole of allyl glucosinolate per gram of seed.

13.8.3 Canola, Mustard, Radish or Rapeseed species that may cross pollinate successfully with other species in this Section and species with difficult to separate seeds, are identified in Table 13.8.3.

Table 13.8.3: Cross Pollinating Species and Species with Difficult-to-Separate Seeds

Species	Canola (*B. napus*)	Canola (*B. rapa*)	Mustard Brown/Oriental (B. juncea)	Mustard White/Yellow (*S. alba*)	Mustard Ethiopian (*B. carinata*)	Radish (*R. sativus*)
B. napus	n/a	CP	CP	DTS	CP	DTS
B. rapa	CP	n/a	CP	DTS	CP	DTS
B. juncea	CP	CP	n/a	DTS	CP	DTS
S. alba	DTS	DTS	DTS	n/a	DTS	DTS
B. carinata	CP	CP	CP	DTS	n/a	DTS
R. sativus	DTS	DTS	DTS	DTS	DTS	n/a

*CP = Some risk of cross pollination *DTS = Difficult-to-separate