



# Agronomic Seed Certification Standards

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## **CERTIFIED SEED PRODUCTION APPLICANT'S PROCEDURES:**

1. Be a member of the Minnesota Crop Improvement Association (MCIA).
2. Obtain eligible planting stock (Foundation or Registered seed of varieties eligible for certification).
3. Make application for field inspection by the following dates:

Soybeans	July 15
Small seeded grasses and legumes	Year of seeding
All other crops	June 7
4. Submit certification tag (bulk certificate for bulk seed) as verification of seed source of each variety with application. Where more than one seed lot is used for the production of a variety, a tag or bulk sale certificate must be submitted from each lot. If breeder seed was planted you must provide a letter of verification from the plant breeder.
5. Prepare seed fields for inspection, rogue out weeds and other crop plants. Have fields ready for inspection before the field inspector arrives. Stage of growth when fields will be inspected is given in the standards for each crop. Harvest no field prior to inspection. If a field is near harvest, notify MCIA or your area Field Supervisor.
6. After seed is conditioned, have it sampled and submit it to a MCIA authorized laboratory for testing.
7. Label seed lots that meet certification requirements with:
  - a. Official certification labels,
  - b. Analysis tags,
  - c. Variety protection statement, if required.

Or supply Bulk Sales Certificate.

## **THE MINNESOTA CROP IMPROVEMENT ASSOCIATION'S RESPONSIBILITIES:**

1. Supply each grower with instructions and materials for making applications for field inspection.
2. Review laboratory tests from samples of conditioned seed lots.
3. Issue labels and/or certificates for seed lots that qualify for certification.
4. Publish an annual directory of Registered and Certified seed producers.

## **PURPOSE OF SEED CERTIFICATION**

The purposes of seed certification are to preserve the genetic purity and identity, increase the supply and accelerate the distribution of seed of new and improved field crop varieties. In the ordinary distribution of commercial seed the buyer must accept the information on the label as to variety and source. In contrast, the variety and origin of certified seed can be traced back to the producer through the information on the label. Field inspection of the growing crop, sampling, laboratory analysis and proper labeling of seed produced by careful, conscientious growers are requirements for certification. These procedures provide the best possible assurance of good quality seed of known purity and heredity.

## **MEMBERSHIP**

All persons interested in the production of quality agricultural seeds in Minnesota are eligible for membership in the Association.

## **WHO CAN PRODUCE CERTIFIED SEED**

Any producer who agrees to follow rules, regulations and procedures of the Minnesota Crop Improvement Association may produce certified seed. Producers who have not previously certified seed in their name must apply to MCIA to become eligible to do so. Following application, a MCIA representative will visit the applicant's farm to explain seed certification thoroughly.

## **SEED DIRECTORY**

The Association publishes an annual directory. Members who apply for field inspection by August 1 may be included in the directory. Applicants may exclude the number of acres of seed they are growing, and any variety may be omitted from the directory at the option of its owner. The directory is distributed to seed growers, seed companies, county Extension offices, vocational agriculture teachers, elevator managers, crop producers, and is available through the Internet at <http://www.mncia.org>.

## **BASIS FOR INSPECTING FIELDS AND TESTING SEED LOTS**

Field inspections are based on careful inspection of randomly selected sites within the field. The field is either passed or rejected depending upon the inspector's analysis of the crop and contaminants in these sites.

Seed testing is based on detailed analysis of a representative sample from the seed lot. The Association of Official Seed Analysts provides specific methods for sampling and testing that are followed by Minnesota Crop Improvement Association authorized laboratories. Seeds are living organisms and some characteristics, such as germination percentage, may change after the tests have been made. The results of any test represent only the characteristics of the seed sample at the time the tests were made.

Standards for some crops allow none of a particular characteristic in a field or a seed lot. When seed lots are passed it means that none were found in the sample tested. When fields are passed, it means that none were found in the non-selected sample size.

## **ELIGIBILITY REQUIREMENTS FOR CROP VARIETIES**

Only crop varieties accepted by the Minnesota Crop Improvement Association in accordance with the criteria established by the Association of Official Seed Certifying Agencies (AOSCA) shall be eligible for certification.

A variety is normally considered eligible if it has been approved by a National Variety Review Board, the Plant Variety Protection Office, an official seed certifying agency, or if it is eligible for certification under an OECD seed scheme. MCIA will determine eligibility of varieties not covered in the preceding sentence. To make this determination, MCIA shall require the originator, developer, or owner of the variety, or agent thereof to provide information as defined in the Federal Seed Act §201.68. The Board of Directors of MCIA is the final authority on variety eligibility. Application forms for establishing eligibility are available from the MCIA office. Owners and developers of varieties of crops for which AOSCA maintains National Variety Review Boards should submit new varieties to the proper Review Board as early as possible to ensure action before undertaking production of certified seed.

## DEFINITIONS

- A. **Variety** - an assemblage of cultivated individuals, distinguished by any character (morphological, physiological, cytological, chemical or others) significant for the purposes of agriculture, which retain their distinguishing features when reproduced or reconstituted.
- B. **Open pollination** – pollination that occurs naturally as opposed to controlled pollination, such as by detasselling, cytoplasmic male sterility, self-incompatibility or similar processes.
- C. **Inbred line** - a relatively true breeding strain resulting from at least five successive generations of controlled self-fertilization, or from backcrossing to a recurrent parent with selection or its equivalent for specific characteristics.
- D. **Foundation single cross** - the first generation hybrid between two inbred lines to be used in the production of double, three-way or top crosses.
- E. A **commercial hybrid** is one to be planted for production for any use except seed. It may be any one of the following:
  - 1. A **double cross**: the first generation of a cross between two single crosses.
  - 2. A **three-way cross**: the first generation of a cross between a single cross and an inbred line.
  - 3. A **single cross**: a first generation cross between two inbred lines. (To be used for commercial production and not for the production of double or three-way crosses).
  - 4. A **top cross**: the first generation of a cross between an inbred line and an open-pollinated variety, or the first generation of a cross between a single cross and an open-pollinated variety.
- F. **Classes Recognized in Seed Certification**
  - 1. **Breeder Seed** is directly controlled by the originating plant breeding institution, firm or individual. It is the source for the production of seed of the certified classes.
  - 2. **Foundation Seed** is the progeny of Breeder or Foundation seed handled to maintain specific genetic purity and identity. Production must be acceptable to the certifying agency.
  - 3. **Registered Seed** is the progeny of Breeder or Foundation seed handled under procedures acceptable to the certifying agency to maintain satisfactory genetic purity and identity.
  - 4. **Certified Seed** is the progeny of Breeder, Foundation or Registered seed handled to maintain satisfactory genetic purity and identity and approved by the certifying agency.
- G. **Other Varieties and Off-types** - plants or seeds that do not conform to the characteristics of a variety as described by the breeder. They do not include variations that are characteristic of the variety.
- H. **Variant** - any seed or plant that: (a) is distinct but occurs naturally within a variety, (b) is stable and predictable with a degree of reliability comparable to other varieties of the same kind, within recognized tolerances, when the variety is reproduced or reconstituted, and (c) was originally a part of the variety as released. A variant is not an off-type.
- I. **Objectionable Weed Seeds** - weeds for which the rate of occurrence in certified seed is limited as indicated in the specific crop standard.
- J. **Prohibited Weed Seeds** - specified by Minnesota Seed Law and Regulations are: Bull thistle, Canada thistle, musk thistle, perennial sow thistle, plumeless thistle, field bindweed, hemp, leafy spurge, perennial peppergrass and Russian knapweed.
- K. **Restricted Weed Seeds** - specified by the Minnesota Seed Law and Regulations are: buckhorn plantain, dodder, Frenchweed, hoary alyssum, horse nettle, wild mustard, quackgrass, wild radish, giant foxtail and Eastern black nightshade.
- L. **Seed Conditioning** - includes all activities performed on the seed between harvest and marketing, such as cleaning, packaging, labeling and storage.

## LIMITATION OF GENERATIONS

The number of generations through which a variety may be multiplied shall be limited to that specified by the originating breeder or owner of the variety and shall not exceed two generations beyond the Foundation seed class, with the following exceptions:

- A. Recertification of the Certified class may be permitted for older varieties where Foundation seed is not being maintained.
- B. The production of an additional generation of the Certified class only may be permitted on a one-year basis when an emergency is declared by the certifying agency stating that Foundation and Registered seed supplies are not adequate to plant the needed Certified acreage of the variety. The permission of the originating or sponsoring plant breeder, institution, firm or owner of the variety, if existent, must be obtained. The additional generation of Certified seed to meet the emergency need is ineligible for recertification.

## APPLICANT'S RESPONSIBILITY

All applicants for certification and all growers and handlers of certified seed must maintain genetic purity and identity at all stages of seed production, conditioning and handling.

While the various inspections, checks and tests minimize the opportunity for carelessness and deception, the production and distribution of certified seed depends on the integrity of the grower or distributor. The Board of Directors will act on any case where rules established by the Association are knowingly or intentionally violated. Action taken by the Board of Directors may result in the suspension of membership in the Association. Any applicant whose reputation is unsatisfactory will be refused field inspection and the privileges of the Association.

It is the responsibility of every member of the Association to abide by the rules, adhere to the standards and report irregularities or violations.

## APPLICATION FOR FIELD INSPECTION

Producers who wish to have their crop certified must apply to MCIA, 1900 Hendon Avenue, St. Paul, MN 55108, on the application form supplied by the Association.

The applicant's signature on the application is affirmation that:

1. The information submitted for verification of seed eligibility is representative of the total amount of seed used.
2. The seed verified in 1 (above) was planted on the field(s) described on the application.
3. All equipment involved with planting, harvesting and other handling was, or will be, adequately cleaned to maintain genetic purity of the seed.
4. The identity of the seed will be maintained at all times through use of field, bin and lot numbers or other identification system.

Applications for inspection must be received by the following dates:

Soybeans — July 15

Perennial grasses and legumes — the year of seeding

All other crops — June 7

Late applications may result in the field inspection not being made. If such inspections can be arranged, a late application fee will be assessed.

## **ESTABLISHING SOURCE OF SEED**

The applicant must furnish an official certification tag, bulk sale certificate or invoice showing variety, seed class and lot number as proof of the seed source. The proof of source must accompany the application.

## **CARE OF EQUIPMENT**

Applicants, growers and conditioners of certified seed are responsible for determining that all equipment used for handling, conveying, storing and conditioning is thoroughly cleaned before it is used for seed to be certified.

## **ROGUING AND WEED CONTROL**

Roguing fields before inspection means removing undesirable plants from fields intended for seed certification. Plants that must be removed include other varieties, and off-type plants of the crop being grown. Prohibited and restricted weeds, other crop plants such as corn in soybeans, wheat in barley, barley in oats, oats in barley, winter rye in winter wheat, and other impurities growing in the field must be removed if their seeds cannot readily be separated from the crop during seed conditioning. Undesirable weeds should be controlled according to recommendations of recognized authorities.

## **FIELD INSPECTION**

Fields producing seed for certification will be inspected by a representative of MCIA before harvest. A crop that is harvested prior to inspection is not eligible for certification. It is the applicant's responsibility to ensure that the crop has been inspected before harvest.

## **INSPECTOR'S REPORT**

The inspector will prepare a written report on the condition of the crop, variety, purity, and freedom from weeds and disease. The field will be passed if conditions are satisfactory, but will be rejected if certification requirements are not met. A report of field inspection will be issued to the applicant when the inspection is completed. This report must be delivered to the seed conditioner with the seed.

## **MAINTAINING IDENTITY OF SEED**

Each field to be certified must be identified with a number or other designation on the field application form and other pertinent documents. Maps showing field identities and locations must be maintained and furnished to crop inspectors. Field-inspected seed must be positively identified at all times. Bins containing bulk lots of seed (cleaned or uncleaned) must be identified by either a bin number or a lot number and variety. If bin numbers are used, accurate records must be kept to correlate bin number with variety and lot number. Bags must be identified by a stenciled lot number or identification tag securely fastened to the bag.

## **SEED CONDITIONING**

All certified seed must be conditioned by the applicant-producer of the seed or by an approved conditioning plant. A list of approved conditioners is published in the Seed Directory; it is available from an MCIA supervisor, from the MCIA office, or online at [www.mncia.org](http://www.mncia.org).

## **SEED SAMPLING AND TESTING**

1. A representative sample of each conditioned lot to be certified shall be drawn by a MCIA authorized sampler according to MCIA seed sampling procedures
2. The sample shall be submitted to a MCIA authorized laboratory for testing along with information necessary to complete certification.
3. MCIA shall determine the seed tests to be performed for each crop type to be certified. The laboratory tests normally include the determination of purity, germination and other factors.
4. All seed shall be tested and analyzed in accordance with the procedures prescribed by the most recent edition of "Rules for Testing Seeds" issued by the Association of Official Seed Analysts (AOSA).
5. Test results shall be evaluated by MCIA for conformance to MCIA seed certification standards.
6. MCIA shall determine the certification status of all lots for which certification has been requested. Evidence that any lot of seed has not been protected from contamination which might affect genetic purity or is not properly identified, shall be cause for possible rejection of certification.

## **SIZE OF SEED LOT**

The lot size for seed in bags or portable containers may not normally exceed 2,500 bushels for small grains and soybeans, 88,000 pounds for corn, 44,000 pounds for sunflowers and 55,000 pounds for small-seeded grasses and legumes.

The maximum size of a bulk lot is the size of the bin in which the seed is stored. For Foundation seed in bulk, the maximum size of a lot stored in a bin shall be 10,000 bushels.

The maximum lot size for seed to be exported under the OECD Seed Schemes is 22,000 pounds for small-seeded grasses and legumes, 55,000 pounds for cereal grains and sunflowers, 66,000 pounds for large seeded legumes including soybeans, and 88,000 pounds for corn.

It is recommended that seed of the same variety harvested from different fields be maintained as separate lots.

## **DOWNGRADING SEED**

Registered seed, except for new varieties, may be downgraded to the Certified class at the discretion of the owner.

## **SUBSTANDARD SEED**

Certain qualities of seed may be affected by environmental conditions, such as unfavorable weather. Seed that fails to meet the certification standards for inert matter and germination may be certified, with the cause for substandard classification stated on the certification label. However, all possible means of upgrading the quality of the seed lot must be used before substandard classification is given.

Barley containing more than 4% loose smut may be labeled substandard.

## **CERTIFICATION RECORDS**

The applicant must keep accurate records of the amount of seed harvested from each field (not necessarily actual weights, but number of truck loads, bins, bags, etc.) and where the seed is stored or taken for conditioning. Seed conditioners must keep the following records for each lot brought into their plants:

1. Name and address of owner of seed.
2. Number or other identification of field(s).
3. Amount (weight, if possible) of uncleaned seed.
4. Date received.
5. Assigned bin number.
6. Condition of seed (if high-moisture, excess weeds, etc.).
7. Weight and/or number of bags of cleaned seed.
8. Date of conditioning.
9. Certification tag numbers placed on bags.
10. If cleaned lots are blended, approximate weight of each component blended.

A sample of each lot of conditioned seed must be kept on file. These records must be kept on file for three years in a record book readily accessible for inspection by authorized persons. File samples must be kept for at least one year after the lot has been completely sold.

MCIA has the right to examine all records of the applicant pertaining to seed lots eligible for certification.

## **TRANSFER OF SEED PRIOR TO COMPLETING CERTIFICATION**

1. Seed of varieties under memorandum of agreement with the Minnesota Crop Improvement Association must not be transferred without prior approval of the Association.
2. An affidavit of transfer stating the number of bushels or pounds and the class of uncleaned seed sold must be sent to the MCIA office at the time of sale. A form is available for this purpose. Such seed can be transferred only to an Approved Seed Conditioning Plant or to another MCIA member.
3. Standard laboratory determinations of quality, purity and germination must be made after the seed has been cleaned by the purchaser.

## **BLENDING OF SEED LOTS**

Blending of lots of the same variety and seed class is generally permissible. If lots of different classes are blended, the lowest class shall be applied to the resultant blend. Seed lots rejected for certification because of prohibited weed seeds cannot be used in a blend of certified seed. Samples of the blended lot must be submitted for laboratory testing and final certification.

## **BAGGING REQUIREMENTS**

Good quality new jute, cotton, plastic or paper bags must be used for Registered and Certified seed that is bagged. All bags in any given seed lot must be of the same kind, size and net weight.

Bags bearing the word "Certified" or the MCIA emblem shall be used only for seed of one of the certified classes.

Rebagging by anyone other than the original producer must be performed under MCIA supervision. Rebagging may be desired for transfer to brand bags, for recleaning or for other reasons. Sampling and the usual tests will be made as deemed necessary; new certification tags may be issued at the discretion of the certifying agency.

## **CERTIFICATION LABELS**

Official certification labels supplied by MCIA shall be affixed to each container of bagged seed in a manner that prevents removal and reattachment. These labels identify the certification agency and seed class. Variety name, seed kind, lot number and identifying number are imprinted before attaching labels. Certification labels shall contain only information approved by MCIA. Seed sold in bulk must be accompanied by a bulk sale certificate.

## **ANALYSIS TAGS**

All Certified seed must be properly labeled with analysis tags in addition to certification labels. Analysis tags may be printed by the grower or distributor. MCIA will print analysis information on the official certification label upon request.

## **BULK CERTIFICATION**

Certified, Registered and Foundation seed of wheat, oats, barley, rye, and soybeans may be sold in bulk, subject to the regulations found in the Seed Certification Handbook.

## **PORTABLE BULK CONTAINERS**

Certified, Registered and Foundation seed of wheat, oats, barley, rye, soybeans, small-seeded grasses and legumes may be sold in portable bulk containers using a bulk sale certificate or certification tag as proof of certification. Refer to the Seed Certification Handbook for required procedures.

## **INTERAGENCY CERTIFICATION**

Interagency certification is the completion of certification in Minnesota for seed that has been field inspected or certified in another state. Those wishing to use interagency certification should contact the MCIA office for instructions.

## **VARIETAL PURITY CERTIFICATION**

Seed can be certified for varietal purity only, if the owner of a variety so specifies. For such varieties, only standards that affect genetic purity will be applied. All seed producers of a given variety will be required to certify it for genetic purity or for genetic and mechanical quality standards according to the procedure elected by the variety owner.

Individual lots to be exported from Minnesota can be certified for varietal purity only. The applicant must specify the intended destination and the seed must meet the minimum certified seed standards of the state or country of destination.

Certification tags of seed certified for varietal purity only will state "Certified for Genetic Purity."

## **REFUNDS**

When a field is canceled all but \$5 of the fees will be refunded provided the request is made to MCIA prior to field inspection. No refund will be given for cancellation after fields have been inspected.

## HYBRID CORN

A commercial hybrid is one to be planted for production for any use except seed. It may be any one of the following:

1. A double cross: the first generation of a cross between two single crosses.
2. A three-way cross: the first generation of a cross between a single cross and an inbred line.
3. A single cross: a first generation cross between two inbred lines. (To be used for commercial production and not for the production of double or three-way crosses).
4. A top cross: the first generation of a cross between an inbred line and an open-pollinated variety, or the first generation of a cross between a single cross and an open-pollinated variety.

### Eligibility of Stock Seed

Only certified Foundation single-cross seed may be planted for the production of double-cross, three-way cross, or top-cross hybrids.

Inbred line seed planted for the production of hybrid corn seed for export must be certified.

Only the class "Certified" is recognized.

### Land Requirements

Seed fields shall not be planted on land that has grown corn of another color or endosperm type during the preceding season/crop.

### Field Inspections

At least three field inspections shall be made during the pollinating period. These inspections will be made without previous notification to the grower.

### Isolation

1. Fields must be isolated as required in the table that follows. Isolation requirements may be met by distance alone, or by a combination of distance and male border rows as specified in the table. The stand of male border rows must be satisfactory and effective. The distance is from the female parent to other corn outside of the crossing field.

Minimum distance from other corn to the first seed parent plant	Field Size	
	To 20 acres	20 acres or more
feet	Minimum border rows	
660	0	0
570	4	2
490	6	2
410	8	4
330	10	6
270	12	8
210	14	10
150	16	12
90	18	14
< 90	24 <sup>1</sup>	16 <sup>2</sup>

<sup>1</sup> Minimum of 60 feet including border rows

<sup>2</sup> Minimum of 40 feet including border rows

2. Adequate natural barriers are permitted for modifying isolation distance.
3. Differential maturity dates are permitted for modifying isolation distance, provided that less than 5% of the seed parent plants have receptive silks at the time pollen is being shed in the contaminating field.
4. Hybrid seed fields must be so located that the seed parent is not less than 660 feet from corn of a different color or texture. Isolation distance from Sweet corn plots totaling less than one-quarter acre

on one exposure of a Hybrid seed corn field may be modified in accordance with the table found above.

### **Detasseling**

1. A field will be rejected when more than 1.0% of the plants in seed rows on any one inspection, or more than a total of 2.0% on three or more inspections, have shed pollen when more than 5.0% of the seed parent plants have receptive silks (based on the number of plants in the tasseling stage).
2. When more than one combination is being grown in the same isolation and the seed parent of one or more of them is shedding pollen in excess of 1.0%, all ear parents having 5.0% or more apparently receptive silks at the time will be disqualified unless adequately isolated from the shedding seed parent.
3. Sucker tassels, portions of tassels, or tassels on main plants will be counted as shedding pollen when two inches or more of the central stem, the side branches, or a combination of the two have anthers extended from the glumes and are shedding pollen.

### **Roguing**

Off-type plants must be removed from a specific field in such a manner that suckers will not develop.

A field will be rejected where more than 0.1% off-type plants have shed pollen when 5.0% or more of the ear parent plants in the field have receptive silks.

A field will be rejected at the last field inspection where more than 0.1% of the ear parent plants are off-types.

### **Male Sterile Ear Parent**

A male sterile ear parent may be used to produce certified hybrid corn seed by either of two methods.

1. Seed of the normal fertile ear parent must be mixed with the seed of the male sterile ear parent of the same pedigree either by blending in the field at harvest or by size at processing time. The ratio of male sterile ear parent seed to normal ear parent seed shall not exceed 2:1.
2. The pollen parent must involve a certified pollen restoring line or lines so that not less than one-third of the plants grown from hybrid corn seed produce pollen which appears to be normal in quantity and viability.

## **FOUNDATION SINGLE CROSS CORN**

A foundation single cross is the first generation hybrid between two inbred lines to be used in the production of double, three-way or top crosses. It must be produced from certified seed of approved lines.

### **Male Sterile Lines**

1. A male sterile line may be substituted for its fertile counterpart as one parent of a Foundation single cross provided:
  - A. The male sterile line has been backcrossed for not less than five generations to its fertile counterpart, and
  - B. The male sterile line is the same in other characteristics as its fertile counterpart.

### **Fertility Restoring Lines**

A fertility restoring line may be substituted for its non-restoring counterpart in a Foundation single cross provided the fertility restoring line is the same in other observable characteristics as its non-restoring counterpart.

### **Land Requirements**

Seed fields shall not be planted on land that has grown corn of another color or endosperm type during the preceding season/crop.

### **Isolation**

A production field of a specific Foundation single cross involving male sterile or fertile material must be so located that it is not less than 660 feet from any kind of corn, except no isolation is required for the increase of hand-pollinated seed. The following exceptions may be considered, when the contaminating field is of the same color and texture.

1. Adequate natural barriers are permitted for modifying isolation distances, and
2. Differential maturity dates may permit modifying isolation distances, provided that less than 5% of the seed parent plants have receptive silks at the time pollen is being shed in the contaminating field.

### **Field Inspections**

At least four field inspections shall be made before and during the pollinating period. These inspections will be made without previous notification to the grower.

### **Detasseling**

A field will be rejected when more than 0.5% of the plants in seed rows on any one inspection, or more than a total of 1.0% on three or more inspections, have shed pollen when more than 5.0% of the seed parent plants have receptive silks (based on the number of plants in the tasseling stage).

### **Roguing**

Off-type plants must be removed from a specific single cross field in such a manner that suckers will not develop.

Any plant shedding pollen in male sterile rows must be destroyed at pollination time to eliminate the possibility of its seed production.

A field will be rejected when more than 0.1% off-type plants have shed pollen when 5.0% or more of the ear parent plants in the field have receptive silks.

A field will be rejected at the last field inspection when more than 0.1% of the ear parent plants are off-type.

### **Ear Inspection**

Foundation single crosses shall be ear-inspected after maturity.

## CORN INBRED LINES

To be eligible for certification an inbred line must be from a source whose identity may be assured and approved by the certifying agency.

An inbred used as a pollinator in a foundation single cross or foundation backcross in isolation may be certified provided all the seed parents in the isolated field are inspected for certification and meet all field requirements for certification.

An inbred line must be a relatively true breeding strain of corn resulting from at least five successive generations of controlled self-fertilization, or from backcrossing to a recurrent parent with selection or its equivalent.

A recovered parent fertility restoring inbred line must have been backcrossed to its recurrent parent with selection for fertility restoration relative to a specific cytoplasmic sterile source for not less than five generations.

Proof of the fertility-restoring ability of the line will be supplied by the originator.

### Isolation, Field Inspections, Roguing, Ear Inspection, Land Requirements

Standards for Foundation single crosses apply.

#### Seed Standards

Factor	Foundation single crosses and inbred lines	Certified commercial hybrid corn
Pure seed (minimum)	99.0%	99.0%
Inert matter (maximum)	1.0%	1.0%
Weed seed and other crops	None	None
Other varieties (maximum)	0.1% <sup>1</sup>	0.5%
Germination (minimum) <sup>2</sup>	90.0%	90.0%

<sup>1</sup> Refers to off-type ears. Ears with off-colored or different textured kernels limited to 0.5 percent or a total of 25 off-colored seeds or different textured kernels per 1,000 ears.

<sup>2</sup> Minimum germination for popcorn is 85%.

Post control testing may be used to determine the final percent hybridization and genetic purity. Final certification of seed lots as determined by the certifying agency may be contingent upon determination of percent hybridization using the following methods:

1. Biochemical methods which determine the percent hybridization by identifying selfs within the seed lot by grade size.
2. Field growouts of seed from production fields or isolations by grade size.

## SMALL GRAINS, FLAX AND SOYBEANS

### General Field Standards

1. A crop will not be eligible for certification if planted where the same kind of crop was grown the previous year unless the previous crop was grown from certified seed of the same variety. All market classes of wheat are considered one crop.
2. Field inspection shall be made as follows:
  - A. Wheat, oats, barley, rye, triticale, annual canarygrass, millet: after the crop is fully headed.
  - B. Flax and buckwheat: when field is in full bloom.
  - C. Soybeans: usually when the crop is approaching maturity but may be at flowering time.
3. The field shall be considered the unit for certification. Fields shall be separated from any other variety, uncertified seed of the same variety, and from other inseparable crops by a distance adequate to prevent mechanical mixture.
4. Wheat fields producing certified seed must be isolated by at least 50 feet for Foundation, 30 feet for Registered, and 20 feet for Certified from fields of any wheat of differing colors or textures, for example, white from red wheat.
5. Rye and buckwheat fields producing certified seed must be isolated by at least 660 feet from fields of any other variety of the same crop, or fields of the same variety that do not meet the varietal purity requirements for certification.

### Small Grains — Wheat, Barley, Oats, Rye, Triticale, Buckwheat, Millet, Annual Canarygrass

#### Specific Field Standards

Factor	Maximum permitted ratio of heads		
	Foundation	Registered	Certified
Other varieties			
Crops except millet	1:10,000	1:5,000	1:2,000
Millet	1:3,000	1:2,000	1:1,000
Inseparable other crops	None	1:30,000	1:10,000

#### Seed Standards — Wheat, Barley, Rye, Triticale, Buckwheat, Millet, Annual Canarygrass

Factor	Standards for each class		
	Foundation	Registered	Certified
Pure seed (minimum) <sup>1</sup>	99.0%	99.0%	99.0%
Total weed seeds (maximum)			
Wheat, barley <sup>2</sup> , rye, triticale, buckwheat, millet	0.05%	0.05%	0.1%
Annual canarygrass	0.1%	0.2%	0.3%
Other varieties (maximum)	0.01%	0.01%	0.1%
Other crop seeds (maximum)	1 per 2 lb	1 per lb	3 per lb
Inert matter (maximum) <sup>1</sup>	1.0%	1.0%	1.0%
Prohibited weed seeds	None	None	None
Restricted and objectionable <sup>3</sup> weed seeds (maximum)	1 per 2 lb	1 per 2 lb	1 per lb
Germination (minimum) <sup>4</sup>	85.0%	85.0%	85.0%

<sup>1</sup> Durum, winter wheat, rye and triticale minimum pure seed 98%; maximum inert matter 2%.

<sup>2</sup> Loose smut percentage on barley must appear on label for all classes.

<sup>3</sup> Wild oats and wild vetch seeds are classified as objectionable weeds in certified seed.

<sup>4</sup> Durum, winter wheat and rye; minimum germination 80%.

**Note:** The maximum loose smut content of Registered and Certified barley seed shall be 4%. Seed lots containing more than 4% may be labeled substandard. The grower is responsible for having a loose smut test on the harvested seed of each field of barley. If seed from more than one field is blended before testing, loose smut tests must be made on each seed lot. Tests must be conducted by laboratories approved by MCIA.

## Seed Standards — Oats

Factor	Standards for each class		
	Foundation	Registered	Certified
Pure seed (minimum)	99.0%	99.0%	99.0%
Total weed seeds (maximum)	0.05%	0.05%	0.1%
Other varieties (maximum)	0.1%	0.2%	0.3%
Other crop seeds <i>excluding rye (maximum)</i>	1 per 2 lb	1 per lb	3 per lb
Other crop seeds <i>including rye (maximum)</i>	1 per 2 lb	1 per lb	10 per lb
Inert matter (maximum)	1.0%	1.0%	1.0%
Prohibited weed seeds	None	None	None
Restricted and objectionable <sup>1</sup> weed seeds (maximum)	1 per 2 lb	1 per 2 lb	3 per lb
Germination (minimum)	85.0%	85.0%	85.0%

<sup>1</sup> Wild oats and wild vetch seeds are classified as objectionable weeds in certified seed.

## Flax

### Specific Field Standards

Factor	Maximum permitted ratio of plants		
	Foundation	Registered	Certified
Other varieties	1:10,000	1:5,000	1:2,000

## Seed Standards

Factor	Standards for each class		
	Foundation	Registered	Certified
Pure seed (minimum)	99.0%	99.0%	98.5%
Total weed seeds (maximum)	0.05%	0.05%	0.1%
Other varieties (maximum)	0.01%	0.01%	0.02%
Other crop seeds (maximum)	1 per 2 lb	1 per lb	3 per lb
Inert matter (maximum)	1.0%	1.0%	1.5%
Prohibited weed seeds	None	None	None
Restricted and objectionable <sup>1</sup> weed seeds (maximum)	1 per lb	1 per lb	3 per lb
Germination (minimum)	85.0%	85.0%	85.0%

<sup>1</sup> Wild oats and wild vetch seeds are classified as objectionable weeds in certified seed.

## Soybeans

### Specific Field Standards

Factor	Maximum permitted ratio of plants		
	Foundation	Registered	Certified
Other varieties	1:1,000	1:500	1:200
Inseparable other crop	None	1:5,000	1:2,000
Corn and sunflower plants bearing seed	None	None	None

### Seed Standards

Factor	Standards for each class		
	Foundation	Registered	Certified
Pure seed (minimum)	99.00%	99.00%	99.00%
Total weed seeds (maximum) <sup>1</sup>	None	0.05%	0.05%
Total other crop seeds (maximum)	0.10%	0.25%	0.60%
Other varieties (maximum)	0.10%	0.20%	0.50%
Other kinds (maximum) <sup>2</sup>	None	0.05%	0.10%
Inert matter (maximum)	1.00%	1.00%	1.00%
Prohibited weed seeds	None	None	None
Restricted weed seeds	None	None	None
Germination and hard seeds (minimum)	85.0%	85.0%	85.0%

<sup>1</sup> Total weed seed maximum: Registered – 1 per pound, Certified – 2 per pound.

<sup>2</sup> Other crop kinds shall not exceed 1 per pound in any class, with no corn or sunflowers allowed.

# SUNFLOWERS

## General Field Standards

1. A crop will be ineligible for certification if planted where sunflowers were grown the previous year.
2. At least three field inspections shall be made, one during the bud to very early blooming stage and two during bloom.
3. At least 50% of the male parent plants in a field producing hybrid sunflower seed must be in bloom and producing pollen when the female parent is in full bloom. Plants shedding pollen in female rows must be removed and disposed of in a manner that will prevent their pollen from being disseminated.
4. The field shall be considered the unit for certification. Fields shall be separated from other sunflowers by 5,280 feet and from other inseparable crops by a distance adequate to prevent mechanical mixture.
5. In inbred lines and Foundation single crosses, only the Foundation class shall be recognized. In hybrid varieties, only the Certified class shall be recognized.
6. In increase fields of inbred parental lines, and in the male rows of commercial hybrid production fields, all off-types must be removed before any pollination has taken place.
7. Standards for seed-borne diseases in sunflowers are not specified; however, the inspector may reject fields for disease if the quality of the seed will be affected.

## Specific Field Standards

Factor	Standards for each class		
	Foundation	Registered	Certified
Off-type plants (maximum per 1,000) <sup>1</sup>			
Hybrid production:			
Female seed parent	4		4
Male pollinating parent	4		4
Open-pollinated varieties	5	5	5
Isolation (feet) <sup>2</sup>	5,280	5,280	5,280

<sup>1</sup> To include not more than one plant of wild type branching, purple, or white-seeded types.

<sup>2</sup> Must be isolated from other varieties, strains, hybrids, non-certified crops of the same variety not being monitored, volunteer sunflowers and wild *Helianthus annuus*.

## Seed Standards

Factor	Standards for each class		
	Foundation	Registered	Certified
Pure seed (minimum)	98.0%	98.0%	98.0%
Total weed seeds (maximum)	None	None	0.10%
Total other crop seeds (maximum)	0.02%	0.07%	0.20%
Other varieties (maximum)	0.02%	0.02%	0.10% <sup>2</sup>
Other kinds (maximum)	None	0.05% <sup>1</sup>	0.10% <sup>1</sup>
Inert matter (maximum)	2.0%	2.0%	2.0%
Prohibited or Restricted weed seeds	None	None	None
Germination (minimum)	85.0%	85.0%	85.0%
Sclerotinia	5 per lb	5 per lb	5 per lb

<sup>1</sup> Shall not exceed one seed per pound.

<sup>2</sup> Shall not include more than 0.04% purple or white seeds.

### Pre-Control Standards

If field inspection shows one or more of the following, the applicant may request that seed certification be based on the results of a pre-certification grow-out test approved by the certification agency:

1. Inadequate isolation.
2. Too few male parent plants shedding pollen when female parent plants are receptive.
3. Excess off types not to include wild types.

In such cases, at least 2,000 plants must be observed and they must meet the following standards before seed can be certified from fields with problems listed above.

### Post-Control Standards

Factor	Hybrid	Inbred
Sterile plants	5.0%	—
Sterile or fertile plants	—	5.0%
Morphological off types	0.5%	0.5%
Wild types	0.2%	0.2%
Total, including above types	5.0%	5.0%

## FIELD BEANS

### General Field Standards

1. A crop will not be eligible for certification if planted on land on which dry field beans or green beans were produced in any of the preceding three years, or soybeans, sunflowers potatoes or sugarbeets were produced the preceding year.
2. Two field inspections shall be made: the first when pods are filling but the leaves are still green; the second when at least 80% of the leaves have fallen.
3. The field shall be considered the unit of certification. Fields shall be separated from any other variety, uncertified seed of the same variety, and from other inseparable crops by a distance adequate to prevent mechanical mixture.
4. A distance between rows of 30 inches or more is recommended.

### Specific Field Standards

Factor	Maximum permitted ratio of plants		
	Foundation	Registered	Certified
Other varieties	1:3,000	1:2,000	1:1,000
Inseparable other crops	None	None	None
Bacterial bean blights			
Leaves	5:100,000	5:100,000	5:10,000
Pods	None	None	None
Common bean mosaic	None	1:200	1:100
Anthracnose	None	None	None
Wilt	None	1:10,000	1:5,000

### Seed Standards

Factor	Standards for each class		
	Foundation	Registered	Certified
Pure seed (minimum)	98.0%	98.0%	98.0%
Inert matter (maximum) <sup>1</sup>	2.0%	2.0%	2.0%
Total weed seeds (maximum per pound)	None	1	2
Other varieties (maximum)	0.01%	0.05%	0.1%
Other crops (maximum per 2 pounds)	None	None	1
Prohibited weed seeds	None	None	None
Restricted weed seeds	None	None	None
Germination (minimum)	NS	85.0%	85.0%
Bacterial blight infected seed <sup>2</sup>	*	*	*
Anthracnose infected seed <sup>3</sup>	None	None	None

<sup>1</sup> Foreign matter other than broken seed may not exceed 0.5%.

<sup>2</sup> The applicant must obtain a bacterial blight test on each field or seed lot. The Dome Test value shall be 4 or less.

<sup>3</sup> The applicant must obtain an Anthracnose test on the harvested seed of each field or seed lot. Anthracnose test results shall be printed on the certification label.

## PERENNIAL GRASSES AND LEGUMES

Application for field inspection is required the year the seeding is established. Neither inspection fees nor field inspection will be required in the year of establishment, but will be required each successive year the crop is in seed production. Lapse of inspection will result in permanent disqualification for the field, unless permission is obtained by the applicant prior to the time inspection is required.

Eligibility for certification is maintained as long as field is continuously in production of certified seed, subject to limitation of length of stand for specific varieties and/or crops. Fields that are not harvested in a given year must be placed on "hold" to maintain eligibility.

Fields on "hold" will be observed by an MCIA inspector during or immediately following the harvest period for the crop and area. These fields lose eligibility to produce certified seed if seed is harvested from them. Any seed lot containing seed from such fields is ineligible for certification. Any applicant or contract grower who harvests seed from these fields more than once will be ineligible to produce certified seed either as an applicant or contract grower.

## Red Clover and Alfalfa

### General Field Standards

1. For the production of Foundation red clover or alfalfa seed, Breeder seed shall be planted on land on which no red clover or alfalfa has been seeded or grown for at least six years. During those six years cultivated crops shall have been grown at least three years.
2. For the production of Registered seed, Foundation seed shall be planted only on land where no red clover or alfalfa seed of any other variety has matured for at least six years, with at least two cultivated crops. An exception is made when the red clover or alfalfa crop is of the same variety, the same or higher seed class, and has passed field inspection for certification.
3. For the production of Certified seed, Registered seed shall be planted only on land where no red clover or alfalfa seed of any other variety has matured for at least four years, with at least two cultivated crops. An exception is made when the red clover or alfalfa crop was of the same variety, the same or higher seed class, and passed field inspection for certification.
4. Stands of red clover or alfalfa will be ineligible to produce any class of certified seed after two seed crops.
5. A field shall be considered the unit for certification.

### Specific Field Standards

Factor	Standards for each class		
	Foundation	Registered	Certified
Other varieties <sup>1</sup>	None	1:500	1:200
Sweetclover plants	None	—	—
Isolation:			
Fields less than 5 acres (feet)	1,320	660	330
Fields larger than 5 acres (feet)	1,320	370	165

<sup>1</sup> Maximum permitted ratio of plants.

### Seed Standards

Factor	Standards for each class		
	Foundation	Registered	Certified
Pure seed (minimum)	99.0%	99.0%	99.0%
Total weed seeds (maximum)	0.15%	0.15%	0.25%
Other varieties (maximum)	0.1%	0.25%	0.25%
Other crop seeds (maximum) <sup>1</sup>	18 per lb.	0.25%	0.25%
Sweetclover seeds (maximum per pound)	9	9	27
Inert matter (maximum)	1.0%	1.0%	1.0%
Prohibited weed seeds	None	None	None
Restricted weed seeds (maximum per pound)	9	9	9
Germination and hard seeds	85.0%	85.0%	85.0%

<sup>1</sup> Including sweetclover.

## Birdsfoot Trefoil

### General Field Standards

1. For the production of Foundation birdsfoot trefoil seed, Breeder seed shall be planted where no birdsfoot trefoil has been seeded or grown for at least five years. The land shall have been in a cultivated crop or in fallow, in the year prior to seeding.
2. For the production of Registered seed, Foundation seed shall be planted only on land that has not grown birdsfoot trefoil for a period of at least four years, with at least one cultivated crop, unless the birdsfoot trefoil crop was of the same variety, the same or a higher seed class, and passed field inspection for certification.
3. For the production of Certified seed, Registered seed shall be planted only on land that has not grown birdsfoot trefoil for a period of at least three years, with at least one cultivated crop, unless the birdsfoot trefoil crop was of the same variety, the same or higher seed class, and passed field inspection for certification.
4. When all other conditions are met, fields are permitted to produce Foundation, Registered or Certified seed for not more than seven years from the original planting (one year of seeding and six years of crop).

### Specific Field Standards

Factor	Standards for each class		
	Foundation	Registered	Certified
Other varieties <sup>1</sup>	1:1,000	1:400	1:200
Sweetclover plants	None	—	—
Isolation:			
Fields less than 5 acres (feet)	1,980	990	495
Fields larger than 5 acres (feet)	1,980	660	330

<sup>1</sup> Maximum permitted ratio of plants.

### Seed Standards

Factor	Standards for each class		
	Foundation	Registered	Certified
Pure seed (minimum)	99.0%	99.0%	98.0%
Total weed seeds (maximum)	0.1%	0.2%	0.5%
Other crop seeds (maximum) <sup>1</sup>	0.1%	0.1%	1.0%
Sweetclover seeds (maximum per pound)	9	9	54
Other varieties (maximum)	0.1%	0.1%	1.0%
Inert matter (maximum)	1.0%	1.0%	2.0%
Prohibited weed seeds	None	None	None
Restricted weed seeds (per pound)	9	9	25
Germination and hard seeds (minimum)	80.0%	80.0%	80.0%
Germinable seed (minimum)	45.0%	45.0%	45.0%

<sup>1</sup> Including sweetclover.

## Bluegrass

### General Field Standards

1. A field to be eligible for the production of Foundation seed must not have grown or been seeded to the same species during the previous five years.
2. A field to be eligible for the production of Registered or Certified seed must not have grown or been seeded to the same species during the previous three years, except to the same variety of the same or a higher seed class that passed field inspection for certification.
3. The certifying agency will determine the length of time fields will be eligible for certification.

### Specific Field Standards

Factor	Standards for each class		
	Foundation	Registered	Certified
Other varieties (maximum) <sup>1</sup>	None	1:100	1:50
Isolation (feet) <sup>2</sup>	60	30	15

<sup>1</sup> Ratio of plants.

<sup>2</sup> Isolation requirements may be reduced to 25% of these distances when different classes of seed of the same variety are being grown on the same or adjacent farms.

### Seed Standards

Factor	Standards for each class		
	Foundation	Registered	Certified
Pure seed (minimum) <sup>1</sup>	95.0%	95.0%	95.0%
Total weed seeds (maximum)	0.3%	0.3%	0.5%
Other crop seeds (maximum)	0.2%	0.5%	1.0%
Other bluegrass species (maximum) <sup>2</sup>	0.1%	0.1%	0.25%
Other varieties (maximum)	0.1%	1.0%	2.0%
Inert matter (maximum)	5.0%	5.0%	5.0%
Prohibited weed seeds	None	None	None
Restricted weed seeds (maximum per lb)	9	9	9
Germination (minimum)	75.0%	75.0%	75.0%

<sup>1</sup> For the variety Merion the standards are: Pure seed (minimum) 92.0%; inert matter (maximum) 8.0%.

<sup>2</sup> Includes fowl bluegrass

## PERENNIAL CROSS-POLLINATED GRASSES

### General Field Standards

1. Breeder seed for the production of Foundation seed shall be planted where the same species has not been seeded or grown for at least five years.
2. A field to be eligible for production of Registered or Certified seed must not have grown or been seeded to the same species during the previous two calendar years unless the crop was of the same variety, the same or a higher seed class, and passed field inspection for certification, or had been summer fallowed for two full seasons prior to seeding to another variety. Fall seeding is permitted in the second year.
3. The certifying agency will determine the length of time fields will be eligible for certification.
4. Fields must be rogued prior to harvest to remove off-type plants and other grasses or weeds whose seed cannot be removed by mechanical means.

### Specific Field Standards

Factor	Standards for each class		
	Foundation	Registered	Certified
Other varieties <sup>1</sup>	None	1:100	1:50
Isolation (feet) <sup>2</sup>	1,320	660	165 <sup>3</sup>

<sup>1</sup> Maximum permitted ratio of plants.

<sup>2</sup> Isolation requirements may be reduced to 25% of these distances when different classes of seed of the same variety are being grown on the same or adjacent farms.

<sup>3</sup> For fields certifiable except for isolation, the field boundary may be established by placing permanent 5-foot posts on either edge of the field, 90 feet from the offending field. The crop between the newly established boundary lines and the offending field may be removed after flowering as a separate field. It may be harvested as uncertified seed.

When two fields are separated by a natural or permanent barrier such as a (1) township, county, state or federal highway, (2) county or judicial drainage ditch or (3) trees or bush, the isolation may consist of a 15-foot strip next to the barrier that can be either destroyed by mowing after bloom but before harvest, or harvested as uncertified seed. The barrier must be free of headed plants of the crop being inspected.

### Seed Standards — Timothy

Factor	Standards for each class		
	Foundation	Registered	Certified
Pure seed (minimum)	99.0%	99.0%	99.0%
Total weed seeds (maximum)	0.2%	0.2%	0.5%
Other crop seeds (maximum)	0.2%	0.5%	0.5%
Other varieties (maximum)	0.1%	0.5%	0.5%
Other grasses, crop only (maximum)	0.1%	0.1%	0.2%
Inert matter (maximum)	1.0%	1.0%	1.0%
Prohibited weed seeds	None	None	None
Restricted weed seeds (maximum per lb)	9	9	9
Germination (minimum)	80.0%	80.0%	80.0%

**Seed Standards — Reed Canarygrass**

Factor	Standards for each class		
	Foundation	Registered	Certified
Pure seed (minimum)	96.0%	96.0%	96.0%
Total weed seeds (maximum)	0.3%	0.3%	0.5%
Other varieties (maximum)	0.1%	1.0%	2.0%
Other crop seeds (maximum)	0.2%	1.0%	2.0%
Inert matter (maximum)	4.0%	4.0%	4.0%
Prohibited weed seeds	None	None	None
Restricted weed seeds (maximum per lb)	9	9	9
Germination (minimum)	70.0%	70.0%	70.0%

**Seed Standards — Perennial Ryegrass**

Factor	Standards for each class		
	Foundation	Registered	Certified
Total ryegrass (minimum)	97.0%	97.0%	97.0%
Total weed seeds (maximum)	0.1%	0.2%	0.5%
Other crop seeds (maximum)	0.2%	1.25%	3.5%
Annual ryegrass <sup>1</sup> (maximum)	0.1%	1.0%	3.0%
Crops other than ryegrass (maximum)	0.1%	0.25%	0.5%
Inert matter (maximum)	3.0%	3.0%	3.0%
Prohibited weed seeds	None	None	None
Restricted weed seeds (maximum per lb)	None	9	9
Germination (minimum)	85.0%	85.0%	85.0%

<sup>1</sup> As determined by a fluorescence test at a MCIA authorized laboratory.

## OTHER CROPS AND BLENDS

Certification of crops not listed in this manual will be governed by standards established by the Association of Official Seed Certifying Agencies, which are available upon request.

Variety blends are eligible for certification in Minnesota, standards are available from MCIA.

### Chickling Vetch

#### General Field Standards

1. Chickling vetch shall be planted on land on which the preceding crop was of another kind, or the same variety of a certified class.
2. Poor stands, poor vigor, lack of uniformity, excess weeds or conditions which are apt to make inspection inaccurate or bring certified seed into disfavor shall be cause for rejection.
3. Isolation shall be adequate to prevent mechanical mixtures.

#### Specific Field Standards

Factor	Maximum Permitted Ratio of Plants		
	Foundation	Registered	Certified
Other varieties	1:1000	1:400	1:100

#### Seed Standards

Factor	Standards for each class		
	Foundation	Registered	Certified
Pure seed (minimum)	95.00%	98.00%	98.00%
Total weed seeds (maximum)	N.S.	None%	0.10%
Other crop seeds (maximum)	0.05%	0.10%	0.20%
Other varieties (maximum)	0.05%	0.10%	0.20%
Inert matter (maximum)	N.S.	2.0%	2.0%
Prohibited weed seeds	None	None	None
Restricted weed seeds (maximum per lb)	0	0	9
Germination (minimum)	N.S.	85.0%	85.0%

## Forage Chicory

### General Field Standards

1. For the production of Foundation forage chicory seed a field shall be planted where no forage chicory has been seeded or grown for at least five years. The land shall have been in a cultivated crop or in fallow, in the year prior to seeding.
2. For the production of Certified seed, the seed shall be planted only on land that has not grown forage chicory for a period of at least three years, with at least one cultivated crop, unless the forage chicory crop was of the same variety, the same or higher seed class, and passed field inspection for certification.
3. When all other conditions are met, fields are permitted to produce Foundation or Certified seed for not more than seven years from the original planting (one year of seeding and six years of crop).

### Specific Field Standards

Factor	Standards for each class	
	Foundation	Certified
Other varieties <sup>1</sup>	1:1,000	1:200
Sweetclover plants	None	-
Isolation:		
Fields less than 5 acres (feet)	660	495
Fields larger than 5 acres (feet)	660	330

<sup>1</sup> Maximum permitted ratio of plants

### Seed Standards

Factor	Standards for each class	
	Foundation	Certified
Pure seed (minimum)	95.0%	95.0%
Total weed seeds (maximum)	0.5%	0.5%
Other crop seeds (maximum) <sup>1</sup>	0.5%	0.5%
Sweetclover seeds (maximum/pound)	54	54
Other varieties (maximum)	0.1%	1.0%
Inert matter (maximum)	3.0%	3.0%
Prohibited weed seeds	None	None
Restricted weed seeds (per pound)	25	25
Germination (minimum)	70.0%	70.0%

<sup>1</sup> Including sweetclover

## Lupines

### General Field Standards

1. A crop will not be eligible for certification if planted where lupines were grown the previous year unless the previous crop was grown from certified seed of the same variety.
2. Field inspections shall be made when the field is in full bloom.
3. The field shall be considered the unit for certification. Fields shall be separated from any other variety, uncertified seed of the same variety, or from other inseparable crops by a distance adequate to prevent mechanical mixture.

### Specific Field Standards

Factor	Maximum permitted ratio of plants		
	Foundation	Registered	Certified
Other varieties	1:1,000	1:500	1:200

### Seed Standards

Factor	Standards for each class		
	Foundation	Registered	Certified
Pure seed (minimum)	98.0%	98.0%	98.0%
Total weed seeds (maximum)	None	1 per lb	2 per lb
Other varieties (maximum)	0.1%	0.2%	0.5%
Other crop seeds (maximum)	None	1 per 2 lb	1 per lb
Inert matter (maximum)	2.0%	2.0%	2.0%
Moisture (maximum)	15.0%	15.0%	15.0%
Prohibited weed seeds	None	None	None
Restricted weed seeds	None	None	None
Germination (minimum)	85.0%	85.0%	85.0%

## Mustard and Rapeseed (Canola)

### General Field Standards (including open-pollinated and synthetic canola)

1. The crop must be planted on land that has not produced rapeseed, canola or mustard during the previous five years for Foundation seed production, or the previous three years for Certified seed production.
2. Field inspection shall be conducted during the bloom stage.
3. The field shall be considered the unit of certification.

### Specific Field Standards (including open-pollinated and synthetic canola)

Factor	Standards for each class	
	Foundation	Certified
Off-type plants <sup>1</sup>	1:2,000	1:500
Plants of other Brassica species <sup>1</sup> (including wild mustard)	1:10,000	1:10,000
Inseparable other crops <sup>1</sup>	1:2,000	1:500
Isolation (feet) <sup>2</sup>	1,320	660

<sup>1</sup> Maximum permitted ratio of plants.

<sup>2</sup> Minimum distance from other varieties of rapeseed, canola, mustard, or non-certified seed of the same variety. Distance between classes of the same variety shall be at least 10 feet.

### General Field Standards (hybrid canola)

1. The crop must be planted on land that has not produced rapeseed, canola or mustard during the previous five years for both the Foundation and Certified classes of hybrid production.
2. At least two field inspections shall be made, one at seedling to pre-bloom and one during bloom. The first inspection should be done to allow for roguing prior to bloom.
3. The field shall be considered the unit of certification; fields should be isolated by the proper distance.
4. Breeder or Foundation seed must be used to establish all fields of hybrid canola for certification. The direction of the cross must remain unchanged throughout the certification program unless adequate data is provided to MCIA to show that no change in variety performance results from the reversal of parentage.

### Specific Field Standards (hybrid canola)

Factor	Standards for each class	
	Foundation	Certified
Off-type plants <sup>1</sup>	1.5:10,000	1.5:10,000
Plants of other Brassica species <sup>1</sup> (including wild mustard)	1:10,000	1:10,000
Inseparable other crops <sup>1</sup>	1:2,000	1:500
Isolation (feet) <sup>2</sup>	2,640	2,640

<sup>1</sup> Maximum permitted ratio of plants.

<sup>2</sup> Minimum distance from other varieties of rapeseed, canola, mustard, non-certified seed of the variety.

## Seed Standards

Factor	Standards for each class	
	Foundation	Certified
Pure seed (minimum)	99.0%	99.0%
Inert matter (maximum)	1.0%	1.0%
Total weed seeds (maximum per pound)	0.05%	0.10%
Prohibited weed seeds <sup>1</sup>	None	None
Restricted weed seeds (per pound)	7	14
Other varieties (maximum)	0.05%	0.25%
Other kinds (maximum)	0.01%	0.01%
Other crop seeds (maximum)	0.05%	0.25%
Germination (minimum)	85.0%	85.0%
Sclerotia (per pound) <sup>2</sup>	7	7
Blackleg test	*	*
Erucic Acid & Glucosinolate Content <sup>3</sup> (Canola)	Pass	Pass
Hybrid Canola only <sup>4</sup>	75%	75%

\* The applicant must obtain a blackleg test on each seed lot. The test must be conducted by a laboratory authorized by MCIA and be blackleg free.

<sup>1</sup> Including cleavers/bedstraw

<sup>2</sup> Sclerotia or fragments of sclerotia of *Sclerotinia sclerotiorum*. Seed lots containing more than 7 sclerotia per pound may be labeled substandard.

<sup>3</sup> MCIA requires a certificate from an authorized laboratory indicating a satisfactory erucic and glucosinolate content prior to final certification for all canola.

<sup>4</sup> A declaration stating the minimum percent hybrid seed and the method of determining the hybridity must be submitted to MCIA prior to final certification.

## Sod Quality Seed Standards

Determination of sod quality seed shall pass through three evaluations:

1. Purity and noxious exam;
2. MCI A Sod Quality exam; and
3. Germination testing.

Seed lots submitted shall meet all standards for certification by the Minnesota Crop Improvement Association. The standards governing the sod quality seed are listed below.

“Noxious” and “all crop and weed” analysis shall be based on a seed analysis of 50 grams for Perennial Ryegrass, and 25 grams of Kentucky bluegrass (including a 10 gram *Poa annua* check in Kentucky bluegrass).

### Sod Quality Seed Standards

Factor:	Minimum Purity	Minimum Germination	Maximum Other Crop <sup>1</sup>	Maximum Weeds <sup>2</sup>
Kentucky Bluegrass <sup>3</sup>	97.00%	80%	0.10%	0.02%
Perennial Ryegrass <sup>4</sup>	98.00%	90%	0.10%	0.02%

<sup>1</sup> Must be free of Bermudagrass, Bentgrass – *Agrostis spp.*, Black medic - *Medicago lupulina*, Clover, Orchardgrass, Redtop – *Agrostis gigantea*, Reed canarygrass, Rough bluegrass – *Poa trivialis*, Ryegrass, Smooth bromegrass, Tall fescue and Timothy. When the base sample is one of these kinds, the species will not be considered a contaminant; i.e., ryegrass in ryegrass.

<sup>2</sup> Must be free of Annual bluegrass – *Poa annua*, Big bluegrass – *Poa secunda*, Chickweed – *Cerastium spp.* and *Stellaria media*, Crabgrass - *Digitaria spp.*, Dock – *Rumex spp.*, Plantain – *Plantago spp.*, Velvet-grass – *Holcus spp.* and other All States noxious weed seeds, except Hawaii.

<sup>3</sup> Maximum other varieties of Kentucky bluegrass allowed is 2%; maximum allowed Canada bluegrass is 0.02%.

<sup>4</sup> Certification fluorescence levels and appropriate calculations will be applied when determining levels of other crop.

## Wild Rice

### General Field Standards

1. The Minnesota Crop Improvement Association's general requirements for certification of all seed classes shall apply to certification of wild rice.
2. The applicant must furnish proof of the seed source.
3. It is the responsibility of all applicants, growers and handlers of certified seed to maintain genetic purity and identity at all stages of seed production, processing and handling.
4. The applicant desiring to have this crop certified must apply to the Minnesota Crop Improvement Association on the application form supplied by the Association.
5. The applicant's signature on the application is affirmation that:
  - a. The information submitted for verification of seed eligibility is representative of the total amount of seed used.
  - b. The seed verified in "a)" (above) was planted on the field(s) described on the application.
  - c. The procedures listed below for managing fields prior to production of certified seed have been followed.
  - d. All equipment involved with planting, harvesting, other handling, was or will be adequately cleaned to maintain genetic purity of the seed.
  - e. The identity of the seed will be maintained from harvest to the time it leaves the applicant's possession through the use of number or other identification system.
6. A crop will be eligible for Foundation class only if planted on land that has never produced wild rice.
7. Registered seed may be produced on land that has never produced wild rice. The following sequence of management is required for growing Registered seed on land previously planted to wild rice:
  - a. In the fall, burn stubble.
  - b. First Year:
    - Fallow with the following method:
      1. Flood spring and drain down.
      2. Cultivate to kill germinated seed.
      3. Cultivate with a cultivator that will leave the soil ridged.
      4. Cultivate three or four times during first summer.
      5. Plow field in fall, depth of 7-9 inches.
    - Or produce an alternative crop using practices that will prevent wild rice seed formation.
  - c. Second Year:
    - Fallow with the following method:
      1. Flood and drain down.
      2. Cultivate same as first year, three or four times.
    - Or produce an alternative crop using practices that will prevent wild rice seed formation.
  - d. Third Year:
    - Flood field and apply for field inspection to MCIA, for plant density evaluation. (*Plant density should be no more than one plant/square foot; if more than one plant/square foot, must re-flood and prove again the following year.*)
    - Cultivate as before, no deep tillage.
    - Monitor ditches and dikes for volunteer wild rice. Treat volunteer wild rice plants to prevent seed formation within 660 feet of the field.
  - e. Fourth Year:
    - Plant Foundation seed.
    - Monitor ditches and dikes for volunteer wild rice. Treat volunteer wild rice plants prior to heading to prevent pollen shed to prevent seed formation within 660 feet of the field.
8. Certified seed may be produced on land that has never produced wild rice. The following sequence of management is required for growing Certified seed on land previously planted to wild rice:
  - a. In the fall, burn stubble.

- b. First year:
    - Fallow with the following method:
      1. Flood spring and drain down.
      2. Cultivate to kill germinated seed.
      3. Cultivate with a cultivator that will leave the soil ridged.
      4. Cultivate three or four times during first summer.
      5. Plow field in fall, depth of 7-9 inches.
    - Or produce an alternative crop using practices that will prevent wild rice seed formation.
  - c. Second Year:
    - Fallow with the following method:
      1. Flood and drain down.
      2. Cultivate same as first year, three or four times.
    - Or produce an alternative crop using practices that will prevent wild rice seed formation
  - d. Third Year:
    - Fallow with the following method:
      1. Flood and drain down.
      2. Cultivate same as first year, three or four times.
    - Or produce an alternative crop using practices that will prevent wild rice seed formation.
  - e. Fourth Year
    - Plant Foundation or Registered Seed
    - Monitor ditches and dikes for volunteer wild rice. Treat volunteer wild rice plants prior to heading to prevent pollen shed to prevent seed formation within 100 feet of the field.
9. The field shall be considered the unit for certification.

### Specific Field Standards

Factor	Foundation	Registered	Certified
Isolation Distances	660 feet	660 feet	100 feet <sup>1</sup>
Other Varieties	0.5%	0.5%	4.5%
Shatter Score	Must not exceed 1.5 times the Breeder's score. <sup>2</sup>		

<sup>1</sup> A minimum of 100 feet of isolation is required for Certified fields. In addition, a minimum of 25 feet on the sides of seed fields that are between 100 feet and 660 feet from other wild rice must not be harvested as Certified seed. This buffer may not be removed until after flowering.

<sup>2</sup> One of two methods allowed:

- Male floret test at full flowering - use post-anthesis loss of the majority of male florets.
- Slap test at hard dough to dark seed stage - use loss of the majority of seeds of the panicle when slapped gently against the palm.

### Seed Standards

No minimum standards will be required for germination or purity other than those required by the Minnesota Seed Law and Rules. To complete certification, the seed producer will submit a sample representative of the entire lot after conditioning to enable MCIA to determine that the seed meets the requirements of the Minnesota Seed Law and Rules.