

# **OREGON SEED CERTIFICATION**

## **FIELD CORN STANDARDS**

Adopted 2/11/2014

Revised 2/16/2015

Revised 2/12/2019

Revised 7/1/2019

Revised 2/19/20

## Application and Fees

Field applications must be submitted through the Oregon Seed Certification Service e-Certification website at [seedcert.oregonstate.edu](http://seedcert.oregonstate.edu). All field applications must be submitted with appropriate seed source documentation, field location maps, and fees. Signup deadline is June 1.

### Corn Fee Structure

Type	Fee
<b>Application fee</b>	\$45 per application
<b>Field Inspection fee</b>	\$60 for 1st acre*, \$15 each additional acre**
<b>Bin Inspection fee</b>	\$25 per bin, minimum \$50 per on-site visit
<b>OECD Assessment</b>	\$0.26 per cwt
<b>Late fee</b>	\$35 per field
<b>Transfer Certificate fee</b>	\$15 per transfer
<b>Handwritten Certificate fee</b>	\$35 per transfer

\* fields less than 1 acre are subject to the \$60 minimum

\*\* after minimum, acreage calculations are rounded to the nearest acre

Refunds will be allowed prior to the June 1 deadline. No refunds will be processed after the application deadline has passed.

## Seed Source Documentation

Each field application must include all original tags for each seed source represented, indicating complete certification by a recognized seed-certifying agency. Tags must clearly identify the product name, origin, source lot, weight and type. Breeder tags or certificates are acceptable where applicable, however, no photocopies will be accepted by OSCS.

### Overseeding

In the event of a failed crop stand, the applicant will notify OSCS and provide additional seed source documentation and amended estimated silking date. No fees are associated with the overseeding notification.

## Land History Requirement

Land must not have been seeded to or grown any type of corn in the previous year to product Foundation or Certified corn. Modifications to this requirement may be made with prior approval from OSCS.

## Bulk Transfer Applications

Applications for Interagency Corn Inspections are submitted through the Oregon Seed Certification Service e-Certification website at [seedcert.oregonstate.edu](http://seedcert.oregonstate.edu). For seed lots entering the state, applications must include a Bulk Transfer Certificate from the prior state's certifying agency. The applicant must make requests for Bulk Transfer Certificates directly to the issuing state. All certified-eligible corn seed leaving the state will be issued a Transfer Pending Final Certification certificate, accessed online.

Bulk transfer shipments entering the state may be signed up for processing prior to receiving the interstate documentation; however, a transfer certificate will not be issued until the incoming documents have been received and verified.

## OREGON SEED CERTIFICATION FIELD CORN STANDARDS

The general standards for seed certification found in the Oregon Seed Certification Service (OSCS) Handbook are basic to all crops, and together with the following specific regulations constitute the certified field corn seed standards.

### HYBRID CORN

#### Seed Class Requirement

- A. Only the Certified class is recognized in hybrid corn seed.
- B. Hybrid corn seed shall mean “seed to be planted for any use except seed production.” It may be any one of the following:
  - 1) Single cross – the first generation of a cross between two inbred lines or an inbred line and a foundation backcross or of two foundation backcrosses.
  - 2) Double cross – the first generation of a cross between two foundation single crosses.
  - 3) Three-way cross – the first generation of a cross between a foundation single cross and an inbred line or foundation backcross.
  - 4) Topcross – the first generation of a cross between an open-pollinated variety and an inbred line or a foundation backcross or a foundation single cross.

#### Eligibility of seedstocks

- A. All seedstocks used as pollen and seed parents in the production of certified hybrid corn seed shall be of the certified Foundation class.
- B. Evidence of eligibility for each seedlot used in the production field shall be an official certified Foundation quality tag or label obtained from a bag containing such seed or other approved documents described in the OSCS Handbook.
- C. A male sterile seed parent can be used to produce Certified hybrid corn seed by either of two methods:
  - 1) Hybrid seed produced on the fertile seed parent shall be mixed with the hybrid seed produced at conditioning time. The ratio of the male sterile parent seed to fertile parent seed shall not exceed 2:1.
  - 2) The pollen parent shall involve pollen restoring line or lines so that not less than one-third of the plants grown from hybrid corn seed resulting from these crossing will produce pollen which appears to be normal in quantity and viability.

#### Field Inspection

The current field inspection procedures are available upon request from the Oregon Seed Certification office. Procedures must include the following:

- A. Before pollination, each separate field shall be inspected by a representative of OSCS for purity of plant type and isolation from contaminating sources of pollen.
- B. A representative of OSCS will make a minimum of three inspections at intervals during pollination over the maturation of the field, as outlined in the procedures.
- C. Field inspections may be made without giving previous notice to the grower.

#### Field Standards

- A. Unit of Certification
  - 1) The entire acreage of a specific pedigree in an isolation shall be inspected for certification. The maximum distance a seed parent row may be from a pollen parent row within a crossing block is 15 feet.

- 2) Portions of an isolation may be considered as separate fields depending upon such factors as maturity differences, boundaries, waterways, roads, etc.
  - 3) More than one hybrid may be produced in an isolation provided the same pollinator is used for all hybrids. The areas occupied by each different crossing block shall be designated in a manner that meets with the approval of OSCS.
- B. Isolation from Contaminating Pollen
- 1) A specific hybrid shall be located so that the seed parent is not less than 660 feet from corn of a different color or texture. For dent corn, this includes sweet, pop, white, or other colored corn. Isolation border rows will not reduce the required isolation distance between dent and other corn. For hybrid seed production fields of dent sterile popcorn, no isolation from yellow dent field corn is required.
  - 2) A specific hybrid shall be located so that the seed parent is not less than 660 feet from other corn of the same color or texture. This distance may be modified by the planting of pollen parent rows as an isolation buffer, depending on the size of the crossing field according to Table 1 below.

Table 1 Prescribed Minimum Border Rows (by field acreage)

<b>Min Distance from Other Corn to the First Seed Parent Plant</b>	<b>Field Size 1 to 20 acres</b>	<b>Field Size 20.1 acres or more</b>
<b>660 feet</b>	0	0
<b>570'</b>	4	1
<b>490'</b>	6	2
<b>410'</b>	8	4
<b>330'</b>	10	6
<b>270'</b>	12	8
<b>210'</b>	14	10
<b>150'</b>	16	12
<b>90'</b>	18	14
<b>Less than 90'</b>	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

- 3) Prescribed border row requirements
  - a. An adjacent hybrid crossing block(s) planted with the same eligible pollen parent may be used as an isolation buffer, provided it is inspected and meets all field requirements.
  - b. Border rows will not be considered acceptable if pollen is not being shed simultaneously with silk emergence of the seed parent.
  - c. Natural barriers such as hills, trees, buildings, or similar objects cannot be used in place of border rows.
  - d. Prescribed border rows may not be taken as certified seed.
  - e. Where pollen parent border rows are ineffective or missing, effectively shedding pollen parent rows within the field may be used in accordance with Table 1 to determine the isolation distance correction in the seed parent.
- 4) Time Isolation: Differential maturity dates are permitted for modifying isolation distance between fields of the same color and texture, provided there are not receptive silks in the seed parent at the time pollen is being shed in the contaminating field.
- 5) Corrections of inadequate isolation must be made by the applicant using one of the following methods:

- a. Completely destroying or detasseling the necessary contaminating corn before silks appear in the seed parent of the certified field.
- b. By disqualifying from certification (and clearly marking) the crossing blocks improperly isolated from contaminating corn, before the final field inspection.

6) Off-type and Volunteer plants

- a. Plants showing definite hybrid vigor or a definitely different phenotype from the parent being inspected shall be classified as definitely off-type.
- b. Definitely off-type plants must be completely destroyed so that suckers will not develop.
- c. An isolation in which more than 0.1% (1 per 1000) of definitely off-type plants in the pollen or seed parent, have shed pollen at a time when more than 5% of the seed parent plants have apparently receptive silks shall be disqualified from certification.
- d. An isolation in which more than 0.1% (1 per 1000) of definitely off-type plants are present in the seed parent at the final inspection shall be disqualified from certification.

D. Detasseling and pollen control

The following applies when 5% or more of the seed parent plants within an isolation have apparently receptive silks<sup>1</sup>:

- 1) A field shall be disqualified from certification if at any one inspection more than 1% of the seed parent plants have shed pollen, or if the total number that have shed pollen for any three inspections on different dates exceeds 2%.
- 2) When more than one hybrid combination is being grown in the same isolation and the seed parent of one or more of the hybrids is shedding pollen in excess of 1%, then all seed parents that have 5% or more apparently receptive silks at the time will be disqualified unless adequately isolated from the shedding seed parent.
- 3) Any tassel or portion of tassel shall be counted as shedding pollen when two inches or more of the central stem or the side branches or a combination of the two have the anthers extended from the glumes. Shedding tassels measuring less than 2" shall be counted as 1/5 of one tassel.
- 4) The detasseling (cutting or pulling) of cytoplasmic male sterile seed parent is permitted.

**Seed Sampling and Purity Testing**

- A. OSCS may use post-control genetic purity testing to determine certification eligibility of any seed lot. Sampling will be performed by an OSCS representative and submitted to a designated testing lab approved by OSCS. Fees associated with additional testing will be paid by applicant.
- B. All certified seed must be sampled and submitted to a designated certification authority for quality testing before final certification and labeling.

**FOUNDATION CORN**

**Seed Class Requirements**

**(Single Cross)**

- A. Only the Foundation class is recognized for seed of such single crosses, backcrosses, and male sterile inbreds produced according to these standards.
- B. Foundation single cross corn seed shall mean "seed to be planted for the production of certified quality hybrid corn seed." It shall consist of the first generation of a cross of any one of the following:
  - 1) Two inbred lines.
  - 2) An inbred line and a Foundation backcross.

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<sup>1</sup> Apparently receptive = emerged but not wilted or brown  
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- 3) Two Foundation backcrosses.
- C. Foundation backcrosses shall be either of the following:
  - 1) A first generation Foundation backcross is the first generation cross between a foundation single cross of related inbred lines and an inbred line which is the same as one of the inbreds in the Foundation single cross.
  - 2) A second-generation Foundation backcross is made by using a first generation backcross as the seed parent; the pollen parent is an inbred line. The inbred line is the same as the inbred parent used in making the first generation backcross seed parent.
- D. Additional requirements for Male Sterile Lines:
  - 1) A male sterile inbred 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—evidence of use of genetic markers may be used to reduce this time, and b) the male sterile line is the same in all other characteristics as its fertile counterpart.
  - 2) Male sterile inbred lines propagated by hand pollination shall be eligible for certification.
- E. Additional requirements for Pollen-Restoring Lines:  
 A pollen-restoring line may be substituted for its non-restoring counterpart in a Foundation single cross, provided the pollen-restoring line is the same in other characteristics as its non-restoring counterpart.

### **Seed Class Requirements (Inbred)**

- A. Only the Foundation class is recognized for seed of eligible inbreds produced according to these standards. For the purpose of certification, the propagation of male sterile inbred lines shall be subject to the same requirements and standards as Foundation Single Crosses.
- B. Foundation inbred corn seed shall mean “seed to be planted for the production of Foundation single cross seed or Certified quality hybrid corn seed.”
- C. An inbred line to be considered for certification shall be a relatively true breeding strain resulting from controlled self-fertilization, or backcrossing to a recurrent parent with selection or its equivalent.
- D. Addition of Specific Genetic Factors to a line
  - 1) When a specific genetic factor is added to an inbred line, the line shall be backcrossed to its recurrent parent at least five generations. The line shall be homozygous for the specific genetic factor except for the pollen restoration factor and the genic male sterile maintainer line.
  - 2) For a recovered pollen restorer inbred line, selection shall be relative to a specific cytoplasmic male sterile source.
  - 3) The originator shall supply proof of the genetic nature of a recovered line.
  - 4) A genic male sterile maintainer line, consisting of duplicate-deficient and male-steriles in an approximate 1:1 ratio, shall be no more than two generations removed from Breeder seed. The maintainer shall be designated according to generation as one of the following:
    - a. Breeder seed: the hand-pollinated selfed seed from a known duplicate-deficient plant heterozygous at a particular male sterile locus.
    - b. Foundation I seed: the product of random-mating among fertile plants arising from Breeder seed.
    - c. Foundation II seed: The product of random-mating among fertile plants arising from Foundation I seed.
  - 5) A genic male sterile line shall be a strain homozygous for a particular male sterile recessive allele.
  - 6) The genic male sterile lines shall be identified as to the recessive genes they carry. The

maintainer lines shall be identified not only for the male sterile gene for which it is heterozygous, but also for the specific translocation from which it was derived,

- E. Inbred lines increased by hand pollination shall be eligible for certification.
- F. An inbred used as a pollinator in a Foundation single cross isolation may be certified, provided all the seed parents within the isolation are inspected and meet all field requirements for certification.

### **Eligibility of Seedstocks**

All seedstocks used as pollen and seed parents in the production of Foundation single cross and Foundation backcross corn seed shall be of the certified Foundation class or whose source assures their identity and are approved by the certifying agency.

Evidence of eligibility for each seedlot used within the isolation shall be an official certified Foundation tag or label obtained from a bag containing such seed, or other such approved documents described in the OSCS Handbook.

### **Field Inspection**

The current field inspection procedures are available upon request from the Oregon Seed Certification office.

- A. Before pollination, each separate field shall be inspected by an OSCS representative for purity of plant type and isolation from contaminating sources of pollen.
- B. A representative of OSCS will make a minimum of three inspections at intervals during pollination over the maturation of the field, as outlined in the procedures.
- C. Field inspections may be made without giving previous notice to the grower.

### **Field Standards**

- A. Unit of Certification
  - 1) The entire acreage of a specific pedigree in an isolation shall be inspected for certification. The maximum distance a seed parent row may be from a pollen parent row within a crossing block is 9 feet.
  - 2) Portions of an isolation may be considered as separate fields depending upon such factors as maturity differences, boundaries, waterways, roads, etc.
  - 3) More than one product may be certified within an isolation provided the same pollen parent is used. The areas occupied by each different crossing block shall be designated in a manner that meets with the approval of OSCS.
- B. Isolation from Contaminating Pollen
  - 1) A specific Foundation seed field shall be located so that the seed parent is not less than 1,320 feet\* from corn of other color or type, and 660 feet from other corn of the same type, excepting pollen parent rows and other seed parents in the same isolated field.
  - 2) Time Isolation: Differential maturity dates are permitted for modifying isolation distance provided there are not receptive silks in the seed parent at the time pollen is being shed in the contaminating field.
  - 3) Corrections of inadequate isolation must be made by the applicant by one of the following methods:
    - a. Completely destroying or detasseling the necessary contaminating corn before silks appear in the seed parent of the certified field.
    - b. By disqualifying from certification (and clearly marking) the crossing blocks improperly isolated from contaminating corn, before the final field inspection.
- C. Off-type and Volunteer Plants

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\* This distance may be reduced to 660 feet when the area of contaminant is 1/10<sup>th</sup> of one acre or less.

- 1) Plants showing definite hybrid vigor or a definitely different phenotype from the parent being inspected shall be classified as definitely off-type.
- 2) Definitely off-type plants must be completely destroyed so that suckers will not develop.
- 3) An isolation in which more than 0.1% (1 per 1000) of definitely off-type plants in the pollen or seed parent, have shed pollen at a time when more than 5% of the seed parent plants have apparently receptive silks shall be disqualified from certification.
- 4) An isolation in which more than 0.1% (1 per 1000) of definitely off-type plants are present in the seed parent at the final inspection shall be disqualified from certification

#### D. Detasseling and Pollen Control

When 5% or more of the seed parent plants within an isolation have receptive silks:

- 1) A field of a specific Foundation single cross shall be disqualified from certification if at any one inspection more than 0.5% of the seed parent plants have shed pollen or if the total number having shed pollen for any three inspections exceeds .75%.
- 2) When more than one Foundation single cross is being grown in the same isolation and the seed parent of one or more of them is shedding pollen in excess of 0.1%, all seed parents having 5% or more apparently receptive silks at the time will be disqualified unless adequately isolated from the shedding seed parent.
- 3) Male sterile inbreds – Any plant shedding pollen in male sterile rows shall be completely destroyed by the applicant to eliminate the possibility of its producing seed. Detasseling shall be acceptable to control plants shedding pollen when the pollen parent is a fertility-restoring line.
- 4) Any tassel or portion of tassel shall be counted as shedding pollen when two inches or more of the central stem, or the side branches, or a combination of the two have the anthers extended from the glumes.

#### **Bin Inspections**

A corn ear inspection is required on Foundation level materials. Applicants must notify OSCS of an estimated bin inspection start date, and request an inspection for each lot intended for certification. Seed that is ear-inspected after maturity shall not contain in excess of 0.1% (1 per 1000) of definitely off-type ears or more than 0.5% (5 per 1000) of ears with kernels of different color or endosperm type which would not exceed a total of twenty-five kernels per 1000 ears.

## Seed Sampling and Testing

- A. OSCS may use post-control genetic purity testing to determine certification eligibility of any seed lot. Sampling will be performed by an OSCS representative and submitted to a designated testing lab approved by OSCS. Fees associated with additional testing will be paid by applicant.
- B. All certified seed must be sampled and submitted to a designated certification authority for quality testing before final certification and labeling.

## Seed Quality Standards

Table 2 Quality Standards

<b>Quality Factors</b>	<b>Certified Seed Class</b>	<b>Foundation Seed Class</b>
<b>Pure seed (min%)</b>	98.0	98.0
<b>TOTAL inert matter (max %)</b>	2.0	2.0
<b>TOTAL weed seed (max %)</b>	None	None
<b>TOTAL other crop seeds (max %)</b>	0.5	N.S.
<b>Other varieties (max %)</b>	0.5	None
<b>Other kinds (max)</b>	N.S.	N.S.
<b>Germination (min %)</b>	90.0	N.S.
<b>Moisture (max %)</b>	14.0	14.0

Foundation seed standards apply only to open-pollinated corn.

Minimum germination for sweet corn is 80.0%.

The 0.5% pertains to a mechanical (visual) purity test where kernels of different color or endosperm type will be weighed to determine this percent.

N.S. – No Standards

## Definitions

**Double Cross (Hybrid):** The first generation hybrid between two single crosses.

**Foundation Single Cross:** A single cross used in the production of a double cross, three-way cross or a top cross.

**Inbred Line:** A relatively true-breeding strain resulting from at least five successive generations of controlled self-fertilization or of backcrossing to a recurrent parent with selection, or its equivalent, for specific characteristics.

**Open-Pollination:** Pollination that occurs naturally as opposed to controlled pollination (detasseling, cytoplasmic male sterility, self-incompatibility or similar processes).

**Single Cross:** The first generation hybrid between two inbred lines.

**Top Cross:** The first generation hybrid of a cross between an inbred line and an open-pollinated variety or the first generation hybrid between a single cross and an open-pollinated variety.

**Three-Way Cross:** A first generation hybrid between a single cross and an inbred line.

**Closed Field:** When the silk percent is at or above 60% the field is defined as closed.

**Open Field:** The first inspection where the female silk is at or greater than 5%.

**Trace Silk:** Less than 5% silk emergence in the field. The field is not open at this time.

**Female Parent or Seed Parent:** The seed-producing parent that is harvested.

**Male Parent:** Pollen-producing rows.

**Male Sterile:** Inbred lines that do not develop viable pollen. Also called female or seed parent.

**Detasseling:** The act of removing the tassel from the corn plant, a.k.a. emasculation, before pollen shed.

**Nick:** Pollen shed and silk emergence at the same time in the field. OECD requires adequate pollen in the field when silks are present.

**Off-Type (Rogue):** Any plant not true to type for the parent planted in a given row. A pollinating parent in a sterile male row is considered an off-type.

**Receptive Silks:** Silks emerging from the ear which are not wilted or brown.

**Roguing:** The act of removing off-types from the field. Roguing is acceptable if done before pollen shed.

**Shedding Tassel:** Any portion of the tassel that has 2 inches of open glumes with anthers extended.

**Volunteer Corn:** Plants of corn growing from the previous crop year.