

## **Seed Certification, Foundation Seed & Plant Materials Board 2022 Meeting Minutes**

Wednesday, February 16, 2022

**Board Members and Guests present:** *Dean Alan Sams; Staci Simonich; Sagar Sathuvalli; Jeremiah Dung; Bob Zemetra; Ken Frost; Andy Hulting; Jennifer Kling; Ryan Graebner; Lee von Borstel; Brian Parker; Mike Macy; Scott Setniker; Seth Crawford; Warren Dole; Elizabeth Savory; Tom Chastain; Bill Braunworth; Dan Curry; Andy Altishin; Dave Stimpson; Alex Albion; Tami Brown; Terry Burr; Jodi Keeling; Mason McKinney; Jeff McMorran; Lorinda Hughes; John Zielinski; Craig Agidius; Mel Laam; Shawn Donkin.*

### **Welcome & Introductions**

Dan Curry called the meeting to order at 1pm. He welcomed the group and invited everyone to introduce themselves. The secretary confirmed that the quorum was met (15 of 19 voting members were present), and official business could be conducted.

### **Approval of 2022 Agenda**

Members moved and seconded to approve the 2022 Meeting Agenda as written. All in favor.

### **Approval of 2021 Minutes**

Members moved and seconded to approve the 2021 Meeting Minutes as written. All in favor.

### **OSU College of Agricultural Sciences report**

Dean Sams warmly greeted the group and announced during his introduction that this would be his last meeting with Seed Certification, Foundation Seed & Plant Materials Board. He went on to say he will be leaving at the end of February for a position he accepted at Texas A&M. He reported that there will be an interim dean named in his absence.

#### **Personnel Updates**

- North Willamette Experiment station in Aurora has a new director, Surendra Dara.
- Jeremiah Dung is the interim direct at Central Oregon Agricultural Research and Extension Center.
- New director search has started at Hermiston Agriculture Research and Extension Center.

#### **Project Updates**

- New Projects include Withycombe Hall renovation including the new dairy processing facility.
- Cordley Hall project is underway, ahead of schedule and over budget so far. The first half will be done in the coming months.
- Hemp program continues to evolve. New layers of growth in the industry where OSU can potentially help and provide information for sound decisions moving forward. Project underway at the university to engage other colleges on campus on research and study on hemp. By including other facets of research there is hope to take the Global Hemp Innovation Center to a new level and increase markets, demand, and industry. Appreciation of Seed Certification adopting certification of Hemp.

Dean Sams complimented Dan Curry's expert leadership of the Seed Services Unit.

## **OSU Extension Service report**

Delivered by Tom Chastain for Sam Angima.

### Extension Faculty Changes

- Betsy Verhoeven, the field crops and grass seed Extension faculty based in Marion County, is leaving her position on March 15, 2022. Extension administration has approved re-filling this position as soon as possible.
- An Extension specialist position in seed production is planned to be filled after current field faculty reconfiguration. The expected date for this to take place is April 2022, if approved.
- There are two new positions in applied economics that are in the process of hiring. These positions are a crop production economist and a community development economist.

## **OSU Department of Crop and Soil Science report**

Tom Chastain gave the report on the current events in the Crop and Soil Science Department.

### Personnel Changes

- Dr. Betsy Verhoeven is joining Crop and Soil Science as an instructor March 16<sup>th</sup>.
- The hiring process has begun for an Assistant Professor of Weed Science position in Corvallis. The position has closed and preparations are being made for interviewing candidates.
- Assistant Professor (Practice) in Ontario position has closed and was a failed search.
- Assistant Professor of Soil Landscape Pedology in Corvallis closed on January 31<sup>st</sup> and the committee is working on narrowing down candidates for interviewing.

### News

- Dr. Bob Zemetra has announced he will retire at the end of December 2022. Dr. Zemetra has served as Professor and wheat breeder in the department since 2011. He is also the current holder of the Warren Kronstad Endowed Chair of Wheat Research at OSU.
- Kristin McAdow is leaving her position as manager of the Soil Health Lab in Crop and Soil Science.
- Crop and Soil Science is making plans for an in-person Hyslop Farm Field Day in May.

## **OSU Horticulture Department report**

Bill Braunworth highlighted current activities from the Horticulture department.

- They are finishing interviews to refill the endowed position for berry crops that Bernadine Strik vacated. There is also a new endowed position open in sustainable landscapes.
- Ryan Contreas is the new associate department head.
- In Milton-Freewater, Cody Copp is moving into a position working with viticulture and tree fruits.
- There are several volunteer programs running within the department of Horticulture, including Master Bee Keepers which has 2,100 members and is growing. There is lots of work going on related to pollinators and bee keepers.
- Large increase in delivery of online courses both noncredit and credit over the pandemic. There is also strong involvement in horticulture major and minor programs.
- There are large concerns over staffing. Ed Peachy is leaving in March and there are many community horticulture and small farm positions that are vacant as well.

## OSU College of Agriculture Sciences Misc. Reports

Executive Associate Dean Staci Simonich echoed Dean Sams' sentiments with stating they are still waiting on an interim dean to be announced. She also stated they have a very strong team within the College of Agriculture and that she thinks the transition will be a smooth one.

Associate Dean of Research Shawn Donkin thanked everyone for welcoming him into the college after joining last August. He highlighted some of the main functions of the Office of Agriculture Research and current updates. They manage the grant portfolio and the processes around grant submissions. They are currently on track to be consistent with last year's number of proposals and requests for awards. Joyce Loper retired this past summer but continues to stay on some special projects within the college, including the Plant Variety Release Program and the Potato Release Program. John Talbot recently retired and has agreed to stay on in a half time position throughout the summer.

### Potato Advisory Committee report and recommendations

Mike Macy and Jeff McMorran led the group through three potato standards changes recommended by the PCAC in January 2022: 1) a modification of Policy Sheet #2 on accepting lots with no Winter Grow Out (WGO), 2) changes to the bylaws related to PCAC membership, and 3) update of the Crop History Section of the Standards.

Item 1 modifies the current Policy Sheet to create a protocol and allow potato lots received from out-of-state that either have only virus testing for the Post-Harvest Test (PHT) or do not have any PHT are treated. (See Attachment 1.)

Item 2 revises the current Bylaws of the PCAC to reflect changes in the way seed grower members are represented. Under this revision, each seed farm attending the meeting has one vote. Other sections of the Bylaws dealing with non-seed grower members were not changed (see Attachment 2).

Item 3 updates the crop history section of the standards.

a) Volunteers

Better defining the tolerance for "volunteers" found during inspections (i.e., potato plants growing in the field that were not derived from the seed source used). Specifically, rewording section X – B of the Potato Standards (Page 14) to read as follows:

B. **Volunteers:** Potato plants found between the planted rows are not permitted if they exceed the tolerance shown for "Variety mixture / off type" on Table 5, (pg. 16), except where the previous crop of **was** the same variety ~~was of an~~ **and an** earlier generation than that being produced.

b) Modification of Crop History

Due to the rare use of this option, and the vagaries of what constitutes a "proven successful" technique to reduce the number of years out of potatoes to produce a specific class without compromising the integrity of the seed harvest, this section of the Standards was dropped. Specifically the removal of part X – C of the potato Standards (page 14).

A motion was made and seconded to approve all three of these action items as presented.  
VOTE: All in favor.

Mike Macy shared with the group that Jeff McMorran would be retiring later this year and thanked Jeff for all of his hard work, as well as everything he has brought to the potato program.

### **Grass and Legume Advisory Committee report and recommendations**

Brian Parker provided the report and recommended action items forwarded from the GLAC.

Item 1 updates wording in Handbook: Section VI. Conditioning Certified Seed, F. Interagency Certification, b. to “Seed that is re-bagged, blended or put into a mixture of certified seed for Oregon Interagency must have an all-states noxious weed seed examination or an equivalent exam as determined by the OSCS office. The seed must meet all the originating authority or Oregon field and seed certification standards, prior to approval.” (See Attachment 3)

It was moved and seconded to approve item 1 as proposed.

VOTE: All in favor.

Item 2 requests approval Border Removal update in the Handbook: Section IV, D. Isolation, Table I, removing all reference to 9 foot border flagging. This update would change the minimum width of border removal from 9 feet to 15 feet (see Attachment 4).

It was moved and seconded to accept item 2 as proposed.

VOTE: All in favor.

### **Cereals Advisory Committee report and recommendations**

Lee von Borstel confirmed that there were no action items being brought to the board by the CAC in 2022.

### **Seed Conditioners Advisory Committee report and recommendations**

There were no action items submitted in 2022. Warren Dole reported that the group had a good meeting.

### **Mint Advisory Committee report and recommendations**

Scott Setniker confirmed that there were no action items submitted by the MAC in 2022.

### **Hemp Advisory Committee report and recommendations**

Seth Crawford presented the two items from the HAC to the board.

Item 1 updates the Special Notes in section B on all standards to “Growers may be required by OSCS to obtain and submit additional testing before the seed can be certified. In addition, growers must meet all applicable State and Federal requirements.” (See Attachment 5)

Item 2 updates the bylaws by adding one ex-officio non-voting position. This position is to be held by a representative of the Global Hemp Innovation Center (see Attachment 6).

It was moved and seconded to approve both action items from the HAC as presented.

VOTE: All in favor.

## **USDA National Clonal Germplasm Repository report**

There was no report given this year.

## **Oregon Department of Agriculture report**

Elizabeth Savory delivered activity highlights from the ODA Seed Regulatory Program (see Attachment 7).

- The Kentucky 31 Investigation into Dynamic Seed Source, LLC and Trevor Abbott was concluded on May 6, 2021. Both parties agreed to pay \$150,000 each in civil penalties to the department. Dynamic's wholesale seed dealer's license was suspended for one year, effective July 1, 2021. If they choose to apply for a license again it would be under probationary conditions.
- In 2022 they are working to update rules around price negotiations. ODA supervises negotiations between the Oregon Grass Seed Bargaining Association and seed dealers for two crops, perennial ryegrass and tall fescue. They are in the process of putting together the rules advisory committee and hope to have that rule in place in time for 2022 negotiations.
- They are also updating the Sod Quality rules. The goal is to harmonize standards with Washington and Idaho, and to simplify the process for getting tags and allow interagency tagging.
- Seed export statistics are included in the report. Annual ryegrass was the most exported seed kind followed by Tall fescue. In 2021 phytosanitary certificates were issued for close to 155 million pounds of seed. This is down from 2020 but still significantly more than 2019. This could potentially be due to lack of transportation and logistics issues not a lack in supply or demand.

## **Oregon Seed Association report**

There was no report given this year.

## **OSU Seed Services report**

Dan Curry offered the Seed Services update (Attachment 8).

- We are in our third year of increasing Gulf breeder seed. The first-year project was completed in 2019 and the 2020 work was put on hold due to the pandemic. Last year we completed the second year of seed increase, and the team hopes to have a small amount of Gulf breeder seed available this fall.
- The Tall Fescue Commission will be increasing the amount of breeder seed of Kentucky 31. It is hoped that we should have an increase of Foundation Kentucky 31 ready to be purchased by the fall of next year and more seed available in 2024.
- Members of an ISTA sub-committee have found genes that would indicate flowering in ryegrass. The next step is to develop protocols for a test that could tell the difference between perennial and annual ryegrass. Primers and protocols will be sent to some labs to see if an effective test can be developed. If successful, we will introduce the method into the ISTA and AOSA rules.
- A team of researchers are working to use computer vision, neural networks, and robotics to develop a prototype machine that could be used to sort off-type seed from pure grass seed. Currently, an undergraduate student is working on training the Neural Network to distinguish between ryegrass and tall fescue. We have applied for a Specialty Crops Grant that would

support further work. If the proposal is funded, we will begin the new research starting in October.

### **Oregon Seed Certification report**

Andrew Altishin reviewed Seed Certification activities for the past year (Attachment 9).

- Overall, certified acres were down by 3% but continues to follow an average yearly trend. Detailed information pertaining to certified crop acreages can be found in the Activity Summary, available online.
- OSCS made several new hires in 2021.
  - Mel Laam was promoted to Office Manager.
  - Kirsten Bradford was hired on as a Program Representative in the main office.
  - Mary Beuthin and Rachel Hankins both left their positions in 2021. Mason McKinney and Craig Agidius were hired to fill those Seed Certification Specialist positions. Mason will be leaving his position shortly, another Seed Certification Specialist position will be opening up.
  - Jennifer Vahl filled the Linn County Sampler Position.
  - Jeff McMorran will be retiring in 2022.
  - Tami Brown shifted responsibilities to take over the hemp program and the potato program.
  - The Union County Sampler position is still open.
- New Fees starting July 1, 2022
  - A minimum charge fee will be assessed if a sampler is unable to sample due to a lot not being accessible or prepared for sampling.
  - Rush fee for delivery of tags.

### **OSU Seed Lab report**

Dave Stimpson updated the group on Seed Lab activities (Attachment 10) .

- The Seed Lab successfully completed their 3-year ISTA audit. The audit took place in late July and corrective actions were issued back to ISTA the week before Thanksgiving. On November 22, 2021 the lab was notified that their audit had been accepted by the auditors and would be submitted to the Executive Committee for their approval. ISTA accounts for ~20% of OSU Seed Lab samples.
- Sample number are down about 25% when compared to the 5-year average as of mid-February. Dave said they are hopeful this number will stabilize over the next few months.
- Consequently, the budget is also negative but the lab is doing okay for now.
- The OSU Seed Lab is down one Bio-Technician, four Analyst 1's and an Administrative Program Assistant currently. In 2021, the Lab had a hard time finding temporary help. They are reviewing hiring strategies including internships, and targeting other audiences for potential analysts. They have recently posted both the Analyst 1 and Analyst 2 positions.
- In November, Lorinda Hughes was promoted as our new Quality Manager. Lorinda was extremely helpful in completing our ISTA audit successfully.
- Recently the Seed Lab received a letter from the Bureau of Land Management that they will only be testing their seeds at USDA accredited labs. The OSU Seed Lab is not USDA accredited but reached out to see if their ISTA accreditation could apply to this. BLM has agreed to honor their ISTA accreditation, so the lab has postponed their USDA audit.

- Dave shared he was hoping they would not have to raise their prices this year, but due to budget constraints and staffing issues they will be raised. They are still working out exactly what the prices will be, but they will be communicated to the industry in late spring and in effect by July 1, 2022.
- Dave addressed the ploidy issues the lab has been addressing over the last couple years, and spoke through the preliminary report (Attachment 11). He gave an update about the referee agreed upon at the Grass and Legume Advisory Committee. They have identified one other lab that does commercially available ploidy testing, which was Agri Seed Testing in Salem. They found research labs at Oregon State University and in Europe that do ploidy testing. They are setting up the referee and are hoping to have results later this spring. Dave expressed that they have been having some difficulty finding people who are willing to work with them on this but believe they have 6 labs that have agreed.

### **Other Business**

No other business was brought forward at this time.

### **Adjournment**

The meeting adjourned at 2:23 pm.

Minutes prepared by Mason McKinney.

All advisory committee meeting minutes and supplementary materials are available online at [seedcert.oregonstate.edu](http://seedcert.oregonstate.edu), or by request to the Seed Certification office.

OSCS POTATO PROGRAM – Policy Statement (#2) **REVISED**

Proposed 1-24-2021

OSCS POLICY REGARDING ACCEPTING OUT-OF-STATE LOTS WHICH HAVE  
NOT HAD A WINTER GROW OUT.

**NOTE:** *OSCS requires that all lots for recertification have a post-harvest grow out (“winter test”) as referenced on page 17-18 of the 2018 Standards. Exceptions to this requirement include (a) Lots received from states/provinces where the official policy is to only conduct lab-based tuber testing on the WGO sample; (b) Lots considered as “special cases” due to late purchase, or lack of other practical alternatives, where an acceptable lot that has had a grow-out of the Post-Harvest sample is not possible. Such “special cases” should be approved in advanced by OSCS. Lots that lack any Post Harvest Testing will not be eligible for recertification in Oregon under any circumstances.*

**Explanation:** The requirement for a winter grow out for any seed to be recertified in Oregon is based on the fact that a grow out allows Certification officials to evaluate a lot for the presence of variety mixtures, chemical damage, and other diseases not detected with a standard ELISA.

**I. PRE-SEASON INQUIRIES:**1. Requirement for accepting out-of-state lots that have not had a “winter test”:

- a. Written request with explanation of the need for waiver: A grower wishing to use seed not subject to a winter grow out must make this request in writing and cite the reason(s) why this lot should be considered for recertification even though it does not fully meet the requirement for certification in Oregon.
- b. Virus testing: A minimum 400-tuber sample must be tested for the presence of PVY, PVA, PLRV by ELISA (or test of equivalent sensitivity) by a laboratory acceptable to the State/Province from which the seed was sent (“originating state”); PVX testing is required on all material classified as Nuclear- FY1 and Generation 1 FY2. A smaller sample will be accepted only if the originating state has a smaller sample requirement for the equivalent class of material in their post-harvest testing requirements.
- c. Shipping point inspection (required). Grower must provide proof of shipping point inspection at time of application.
- d. First field inspection: The first field inspection will use examine at least double the minimum count requirement. Not to exceed counts of 12,000 plants (2,000 clicks).

## II. POST PLANTING SITUATIONS:

### A. Lots with only virus testing (no Winter Grow-outs):

When an out-of-state lot was found after planting (un-be-knowns to the purchaser) to have only an ELISA test as described in Part A, and not to have had a winter grow out, the following actions must be taken to allow for certification. These steps are not required if virus testing was the only option available in the source state/province.

1. The lot is initially **REJECTED** as being ineligible for recertification in Oregon because of lack of a winter grow out.
2. The grower may then **appeal** (in writing, eMail OK) this decision citing the reason why this lot should be considered for recertification even though it does not fully meet the requirements for certification in Oregon.
3. If satisfactory explanation is given the lot could be approved for recertification **ONLY** if the following **provisions** are met:

a. The lot may be certified at the current otherwise eligible class if a **winter grow out at 2x** the normal sample size is submitted and the lot passes in regards to tolerances at this class. The grower will be required to pay double the regular fee for this test.

**OR**

b. The lot may be certified at the next higher class (i.e. downgraded a class) if a winter grow out at 1x the normal sample size is submitted and the lot passes in regards to tolerances at this class. Normal winter grow out fee to apply.

c. First field inspection: The first field inspection will use examine at least double the minimum count requirement. **Not to exceed counts of 12,000 plants (2,000 clicks).**

### B. Lots with no post-harvest testing:

Lots that lack any Post Harvest Testing will not be eligible for recertification in Oregon, and will initially be **REJECTED** as being ineligible for recertification. The grower may then **appeal** (in writing, eMail OK) this decision citing the reason why this lot should be considered for recertification even though it does not fully meet the requirements for certification in Oregon. Though still considered a “special case” the lot may be accepted provided the following conditions are applied:

a. A virus sample of 400 leaves per lot is taken at the first inspection at random across the field and are tested for PVY. The PVY levels must not exceed tolerance levels for mosaic at the specific class. Downgrading is permissible. The grower is charged a ‘sampling fee’ by OSCS and billed by the OSU lab for the virus testing required.

b. A standard Winter Growout sample is submitted. No exceptions are permitted for Own-Use-Only or lot size.

**NOTE:** “Special Case” exemptions are generally only allowed once per grower for a specific source grower.

*Originally approved by OSCS Potato Advisory Board Committee and Certification Board in 2004. Revised as recommended by the Potato Certification Advisory Committee in 2007 & 2019. Proposed revision 1-25-2022. (12-14-21 – JMc)*

## Revised Bylaws Revised Wording

### Article III. Membership

1. The Advisory Committee consists of the following membership: 1 voting member from each Farm of certified seed potatoes the previous season; and two commercial potato growers selected by the Oregon Potato Commission; one OSU researcher; one extension specialist; and one county agent. In addition, the Certification Program, and the Commodity Inspection Division, Oregon Department of Agriculture, shall be represented by one ex-officio member each. Other ex-officio members may be appointed as the Dean or the committee deem necessary.
2. ~~Representatives of the committee shall be appointed from the following geographical areas by the organizations listed below:~~
  - ~~Klamath Potato Growers Association (KPGA) — three seed potato growers (includes Southern Lake County).~~
  - ~~Central Oregon Potato Growers Association (COPGA) — two seed potato growers (includes Crook, Deschutes, Jefferson and Northern Lake County).~~
  - ~~Blue Mountain Potato Growers Association (BMPGA) — two seed potato growers.~~
2. The committee shall consist of the following representatives:

- Oregon certified seed growers- 1 voting member from each Farm producing certified seed potatoes the previous season;
- ~~Oregon Seed Potato Growers Association — one ‘at large’ seed grower~~
- Oregon Potato Commission – two representatives who must be commercial potato growers.
- College of Agricultural Sciences (OSU) – one researcher, one extension specialist, one county agent, one Foundation Seed representative (ex-officio), and one Certified Seed representative (ex-officio).

### Article IV. Term of Membership

1. ~~The eight~~ Seed producers - no limit on length of service. Voting membership to be determined by each individual farm.
2. The two commercial growers, shall serve three years. Re-appointment for additional term(s) is permissible.

*{ the rest of the bylaws the same }*

2021 Grass and Legume Advisory Committee

Item 3.

Current wording:

“Seed that is re-bagged, blended, or put into a mixture of certified seed for Oregon interagency Certification must have an all-states noxious weed seed examination in addition to meeting either, another state’s or Oregon’s certification field and seed standards, prior to approval.”

Suggested wording

"Seed that is re-bagged, blended or put into a mixture of certified seed for Oregon Interagency must have an All-States Noxious weed seed examination or an equivalent exam as determined by the OSCS office. The seed must meet all the originating authority or Oregon field and seed certification standards, prior to approval."

## Item 9

**Interagency Certification**

- A. VI. Conditioning Certified Seed Section F.1.a of the Handbook says, "Seed that is re-bagged, blended, or put into mixture of certified seed for Oregon Interagency Certification must have an all-states noxious weed seed examination as well as meeting either, another state's or Oregon's certification field and seed standards, prior to approval." We suggest that the wording be amended so that we can accept equivalent exams. This will streamline things for the customers as well as the OSCS office because in many cases the customer must resample the lot and have it tested for all-states noxious before going forward with certification.

"Country's" should also be added because we do interagency certification from both AOSCA and OECD programs in other countries.

- B. We also have a request to accept "Continental US" noxious weed exams, which exclude Alaska, from Minnesota in lieu of an all-states noxious exam. Minnesota routinely conducts a Continental US exam, so an all-states noxious exam is a special request. The four noxious species for Alaska that are excluded are:

*Galeopsis tetrahit* (hempnettle)

*Galinsoga parviflora* (galinsoga)

*Lappula echinata* (*Lappula echinata* is a synonym of *Lappula squarrosa*) (blue burr)

*Vicia craca* (tufted vetch)

Is this something we should consider adding to the above section?

The suggested wording is:

"Seed that is re-bagged, blended, or put into a mixture of certified seed for Oregon Interagency Certification must have either an all-states noxious weed seed examination, a Continental US noxious weed exam, a crop and weed exam, or an ISTA Complete Other Seed Determination. Kentucky bluegrass must have at least 10 grams tested. The seed must also meet either another state's, country's, or Oregon's certification field and seed standards, prior to approval."

8) Update the Handbook page 10, VI, F. 1 This update would make additional types of weed exams used in Interagency Certification acceptable to the OSCS program for purposes of re-bagging or being used in Oregon Certified mixtures or blends. Some areas of the country, or even out other countries, use different tests that are equivalent but not explicitly acceptable, necessitating re-testing upon application to the program.

Current Handbook phrasing: “Seed that is re-bagged, blended, or put into a mixture of certified seed for Oregon Interagency Certification must have an all-states noxious weed seed examination in addition to meeting either, another state’s or Oregon’s certification field and seed standards, prior to approval,”

Proposed phrasing: “Seed that is re-bagged, blended or put into a mixture of certified seed for Oregon Interagency must have either an all-states noxious weed seed examination, a Continental US Noxious Weed Exam, a 6 Seed Certification, Foundation Seed & Plant Materials Board 2021 Meeting Minutes crop and weed exam, or an ISTA Complete Other Seed Determination. Kentucky bluegrass must have at least 10 grams tested. The seed must also meet either another state’s, country’s, or Oregon’s certification field and seed standards, prior to approval.”

Discussion: Concerns arose that there may be a loosening of Oregon’s standards by making tests from other places, where standards may be lower, eligible for Oregon tags. Certification spent a lot of time evaluating the Continental US Noxious Weed Exam and ISTA Complete Other Seed Determination, and determined that they may offer more information than currently acceptable AOSCA All States Noxious and OECD Certified Crop and Weed exams. Someone asked about the volume of work that reviewing eligibility for these entails, and it is not insignificant. Not only does this change help streamline the process for OSCS office staff, but it is a money-saving service that can be provided by expanding to allow these tests to provide the same information. The addition of “country’s” to the final sentence is not new in practice as OSCS has been accepting OECD certified lots all along. It was suggested to take the last sentence back to committee to review in further detail, to clarify the intention. During discussion, it was suggested to phrase the update this way: “Seed that is re-bagged, blended or put into a mixture of certified seed for Oregon Interagency must have either an all-states noxious weed seed examination, a Continental US noxious weed exam, a crop and weed exam, or an ISTA Complete Other Seed Determination; in addition, the seed must also meet either another state’s, country’s or Oregon’s certification field and seed standards, prior to approval. Kentucky bluegrass must have at least 10 grams tested.” There was further concern about leaving “country’s” unspecified; it was suggested to add OECD/AOSCA certified to the phrasing. Again, it was mentioned that this section relates to Interagency certification, which already implies that only OECD or AOSCA tagged lots would be accepted. Concerns continued about ensuring clarity so that the acceptance of this change would not dilute the meaning behind the Oregon blue tag. After much deliberation, the Board moved and seconded to table item 8 for GLAC to revisit the entire proposal at their next meeting, no changes were made to the existing wording. They request a more detailed explanation of the issue and proposed solution in 2022. All in favor.

## 2021 Grass and Legume Advisory Committee

## Item 4. Border Removal

## Current Border Removal Requirements:

Border Removal for Grass Isolation (for fields 5 acres or larger)		
<i>Generation/Class of Inspected Crop</i>	Distance from the contaminating pollen source	Width of Border Removal area <sup>1</sup> within the seed field
Foundation	900 feet or more	0 feet
	600-899 feet	9 feet
	450-599 feet Less than 450 feet	15 feet 465 feet <sup>2</sup>
Registered	300 feet or more	0 feet
	225-299 feet	9 feet
	150-224 feet Less than 150 feet	15 feet 165 feet <sup>2</sup>
Certified	165 feet or more	0 feet
	105-164 feet	9 feet
	75-104 feet Less than 75 feet	15 feet 90 feet <sup>2</sup>
<sup>1</sup> The Border to be removed from the certified field shall be clearly marked with an adequate number and height of stakes (at least one every 300 feet and taller than the mature canopy height) so that the inspector can determine the distance. Inadequate or improper staking will require re-inspections. <sup>2</sup> The required Border Removal is measured from the edge of the contaminating pollen source.		

## Suggested Revision

Border Removal for Grass Isolation (for fields 5 acres or larger)		
<i>Generation/Class of Inspected Crop</i>	Distance from the contaminating pollen source	Width of Border Removal area <sup>1</sup> within the seed field
Foundation	900 feet or more	0 feet
	450-899 feet	15 feet
	Less than 450 feet	465 feet <sup>2</sup>
Registered	300 feet or more	0 feet
	150-299 feet	15 feet
	Less than 150 feet	165 feet <sup>2</sup>
Certified	165 feet or more	0 feet
	75-164 feet	15 feet
	Less than 75 feet	90 feet <sup>2</sup>
<sup>1</sup> The Border to be removed from the certified field shall be clearly marked with an adequate number and height of stakes (at least one every 300 feet and taller than the mature canopy height) so that the inspector can determine the distance. Inadequate or improper staking will require re-inspections. <sup>2</sup> The required Border Removal is measured from the edge of the contaminating pollen source.		

## Removal of 9 foot border removal.

1. No grower spoken with has a 9 foot swather.
2. The border of the field tends to have a poorer stand, especially at the 9 feet.
3. Simplifies the system.



**Oregon Seed Certification Service**  
<http://seedcert.oregonstate.edu>

**CERTIFICATION STANDARDS**  
**ESSENTIAL OIL INDUSTRIAL HEMP**  
 (*Cannabis sativa* L.)  
 Revised February 16, 2021

**Certification 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 Essential Oil Hemp standards.

**Varieties Certified:** Only varieties approved for production by Federal or local regulatory authorities may be eligible for seed certification.

**Field History:** To produce Foundation or Registered seed, land must not have been grown or seeded to any *Cannabis* sp. during the previous three years. To produce Certified seed, land must not have grown or been seeded to any *Cannabis* sp. in the previous 2 years. This may be reduced to one year if the same variety and certified. Hemp must be planted in distinct rows. OSCS must approve exceptions prior to planting. To produce Certified Seed in greenhouse production, the greenhouse must be free of all plants a minimum of six weeks prior, unless the previous variety was the same variety and Certified. Sanitation may be considered in lieu of the six weeks, and a plan must be submitted to and approved by OSCS prior to production.

**Greenhouse and Field Inspections:** Three inspections may be required depending on the variety type and production generation; at least two inspections are required prior to seed harvest. Crop inspection of pollen donor and pollen receptors must be inspected at a stage of growth when varietal purity is best determined. Crops not inspected at the proper stage for best determining variety purity may be cause for declining certified status. The first inspection for pollen donor and pollen receptor types occurs just before or at early flowering, the second must occur at mid-bloom with active pollen shed, normally within 3 weeks after first inspection; the third inspection, if necessary, occurs when off- type female flowers can be identified. Applications shall be made within 7 days of placement of seedlings in the greenhouse or field. For fields directly seeded, applications shall be made within 14 days of planting.

**Field Standards:**

Class of Seed Produced	Variety Type	Maximum Number of Dioecious Male Plants Shedding Pollen <sup>1</sup>	Off Types <sup>2</sup>	Number of Inspections	Isolation Distance Required		
					From different varieties of hemp or contaminating pollen source that has pollen present, or non-certified Hemp	Fields planted with Certified seed of the same variety	From same variety and meets certification standards
Foundation <sup>3</sup>	Conventional	1	0	3	21,120 ft	15,840 ft	16 ft
	Clonal	--	0	3			
Registered <sup>3</sup>	Conventional	2	10	3	21,120 ft	15,840 ft	3 ft
	Clonal	--	10	2			
Certified <sup>3</sup>	Conventional	100	10	2	21,120 ft	15,840 ft	3 ft
	Clonal	--	10	2			
	Hybrid	100	10	2			
	Feminized	0	20	2			

<sup>1</sup> Maximum impurities allowed per 10,000 plants; applied as an average of six counts involving at least 10,000 plants each. Includes off-types or other varieties. For greenhouses maximum impurities allowed per 1,000 plants; applied as an average of six counts involving at least 1,000 plants each. If less than the required number of plants are present, all plants will be observed and used in calculations.

<sup>2</sup> If Dioecious male plants start flowering before removal from field, all plants around them should be destroyed for a radius of 10 feet for Foundation and 7 feet for Registered seed crops.

<sup>3</sup> An OSU Seed Lab Orobancha exam is required if Small Broomrape is found in a certification field inspection. Two samples are to be submitted in separate containers: one for the Orobancha exam, the other for standard purity and viability testing.

**Greenhouse Standards:** Each greenhouse facility is limited to one pollen source

Class of Seed Produced	Variety Type	Maximum Number of Dioecious Male Plants Shedding Pollen <sup>1</sup>	Off Types	Number of Inspections	Isolation Distance Required*		
					From different varieties of hemp or contaminating pollen source that has pollen present, or non-certified Hemp	Fields planted with Certified seed of the same variety	From same variety and meets certification standards
Foundation <sup>3</sup>	Conventional	1	0	3	21,120 ft	15,840 ft	16 ft
	Clonal	--	0	3			
Registered <sup>3</sup>	Conventional	2	1	3	21,120 ft	15,840 ft	3 ft
	Clonal	--	1	2			
Certified <sup>3</sup>	Conventional	100	2	2	21,120 ft	15,840 ft	3 ft
	Clonal	--	2	2			
	Hybrid	100	2	2	21,120 ft	15,840 ft	3 ft
	Feminized	0	2	2			

**\*Isolation distances may be waived if pollen exclusion methods are documented and submitted prior to inspection**

**Seed Standards:** (Minimum Sample Size – 1000 grams, excess seed will be returned)

Factor	Foundation	Registered	Certified (Blue tag)
Pure seed, minimum	98.00%	98.00%	98.00%
Other crops, maximum	0.01%	0.03%	0.08%
Inert matter, maximum <sup>4</sup>	2.00%	2.00%	2.00%
Weed seed <sup>5</sup> , maximum	0.10%	0.10%	0.10%
Other varieties, maximum	0.005%	0.01%	0.05%
Other kinds <sup>6</sup> , maximum	0.01%	0.03%	0.07%
Germination	85.00%	85.00%	85.00%
Feminized seed <sup>7</sup>	--	--	99.9%

**Special notes:**

A. Greenhouse production – For certification purposes, a greenhouse will be identified as a single “field.” This should match the warehouse information given to ODA.

~~B. Growers will be required by Federal or local regulations to obtain THC test results from a recognized laboratory verifying that the THC content of their hemp crop complies with applicable regulations. Growers shall be required to submit these results to OSCS to complete seed certification, and the results will be verified with ODA. Growers may be required by OSCS to obtain and submit additional testing before the seed can be certified. In addition, growers must meet all applicable State and Federal requirements.~~

C. Growth facility must only contain certified hemp production.

<sup>4</sup> Inert Matter shall not include more than 0.5% of material other than seed fragments of the variety under consideration

<sup>5</sup> None of the prohibited weeds listed in Section V in the OSCS Handbook, nor any Docks, Sheep Sorrel or St. Johnswort allowed in any class of seed.

<sup>6</sup> Other kinds shall not exceed 2 per lb. (454 grams) for Foundation; 6 for Registered; 10 for Certified

<sup>7</sup> Determined by Variety Verification Trial or approved molecular testing.



**Oregon Seed Certification Service**  
<http://seedcert.oregonstate.edu>

**CERTIFICATION STANDARDS**  
**FOOD, FIBER, AND GRAIN INDUSTRIAL HEMP**  
*(Cannabis sativa L.)*  
 Revised February 16, 2021

**Certification 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 Industrial Hemp standards.

**Varieties Certified:** Only varieties approved for production by Federal or local regulatory authorities may be eligible for seed certification. Varieties may represent the following types<sup>1</sup>: Monoecious, with male and female flowers on the same plant; Dioecious, with male and female flowers on separate plants; and (unisexual female) Hybrids, with sterile male and fertile female flowers on the same plant.

**Field History:** To produce Foundation and Registered seed, land must not have grown or been seeded to any *Cannabis* sp., hops or tobacco during the previous three years, for Certified seed two years, this may be reduced to one year if the same variety and certified. Hemp must be planted in distinct rows. OSCS must approve exceptions prior to planting.

**Field Inspections:** Three inspections may be required depending on the variety type and production generation; at least two inspections are required prior to seed harvest. The first inspection occurs before female (pistillate) flowers of the crop are receptive and after the formation of male (staminate) flowers, preferably before pollen is shed; the second inspection occurs during the receptive stage of female plants, normally within 3 weeks after first inspection; the third inspection, if necessary, occurs when off-type female flowers can be identified. The field application must be submitted within 60 days of planting, and a seed crop application must be submitted by April 15 of each year in which seed is produced.

**Field Standards:**

Class of Seed Produced	Variety Type	Maximum Number of "Too Male" Monoecious Plants <sup>2</sup>	Maximum Number of Dioecious Male Plants Shedding Pollen <sup>2,3</sup>	Maximum Number of Other Impurities <sup>2</sup>	Number of Inspections	Isolation Distance Required	
						From Different Varieties or Types	From Lower Certified Class of Same Variety
Foundation <sup>4</sup>	Monoecious	500	1	3	3	3 miles	2 miles
	Dioecious	--	--	3	3		
Registered <sup>4</sup>	Monoecious	1000 (10%)	2	10	3	3 miles	1 mile
	Dioecious	--	--	10	2		
Certified <sup>4</sup>	Monoecious	--	100	10	2	1 mile	--
	Dioecious	--	--	10	2		
	Hybrid	--	100	10	2		

**Seed Standards:** (Minimum Sample Size – 1000 grams, excess seed will be returned)

Factor	Foundation (White tag)	Registered (Purple tag)	Certified (Blue tag)
Pure seed, minimum	98.00%	98.00%	98.00%
Other crops, maximum	0.01%	0.03%	0.08%
Inert matter, maximum	2.00%	2.00%	2.00%
Weed seed <sup>5</sup> , maximum	0.10%	0.10%	0.25%
Germination	85%	85%	85%

**Special notes:**

**A.** Greenhouse production – For certification purposes, a greenhouse will be identified as a single "field."

**B.** ~~Growers may be required by Federal or local regulations to obtain THC test results from a recognized laboratory verifying that the THC content of their Industrial Hemp crop complies with applicable regulations. Growers may be required to submit these results to OSCS to complete seed certification.~~ Growers may be required by OSCS to obtain and submit additional testing before the seed can be certified. In addition, growers must meet all applicable State and Federal requirements.

**C.** Growth facility must only contain certified hemp production.

<sup>1</sup> Although traditionally a crop with a Dioecious plant type, many Monoecious varieties of hemp have been developed. Hemp is sexually polymorphic and often produces many different ratios of intersexual plant types that can increase rogueing requirements. Variety descriptions normally define these ratios.

<sup>2</sup> Maximum impurities allowed per 10,000 plants; applied as an average of six counts involving at least 10,000 plants each. Includes off-types or other varieties.

<sup>3</sup> If Dioecious male plants start flowering before removal from field, all plants around them should be destroyed for a radius of 10 feet for Foundation and 7 feet for Registered seed crops.

<sup>4</sup> An OSU Seed Lab Orobanche exam is required if Small Broomrape is found in a certification field inspection. Two samples are to be submitted in separate containers: one for the Orobanche exam, the other for standard purity and viability testing.

<sup>5</sup> None of the prohibited weeds listed in Section V in the OSCS Handbook, nor any Docks, Sheep Sorrel or St. Johnswort allowed in any class of seed.



**Oregon Seed Certification Service**  
<http://seedcert.oregonstate.edu>

CERTIFICATION STANDARDS  
**TRANSPLANT STOCK HEMP**  
 (*Cannabis sativa* L.)  
 Accepted February 16, 2021

**Certification 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 Transplant Stock Hemp standards.

**Varieties Certified:** Only varieties approved for production by Federal or local regulatory authorities may be eligible for seed certification.

**Field History:** To produce certified transplants, land must not have grown or been seeded to any *Cannabis* sp. in the previous 2 years. This may be reduced to one year if the previous crop was certified. Hemp must be planted in distinct rows. OSCS must approve exceptions prior to planting. To produce Certified transplants in greenhouse production, the greenhouse facility must submit a Standard Operating Procedure and document the facility is free of any plant material from a previous crop prior to production. Soil mix must be new, soil-less media, or sanitized soil mixes.

**Greenhouse and Field Inspections:** All transplant production will be inspected at least twice for varietal labeling, phenotypic purity, isolation, general physical condition, and appearance of plants. Additional inspections may be necessary to ensure certification standards are met. Unlabeled or inadequately labeled transplants will be ineligible for certification. Applications shall be made within 7 days of placement of seedlings in the greenhouse or field. For fields or greenhouses directly seeded, applications shall be made within 14 days of planting.

**Field and Greenhouse Standards:**

Class of Seed Produced	Unsatisfactory plants*	Off Types	Number of Inspections	Isolation Distance
				From a different variety (prior to flowering)
Foundation	0	20 in 10,000	2	1.5 ft
Registered	0	20 in 10,000	2	1.5 ft
Certified	0	20 in 10,000	2	1.5 ft

\*Unsatisfactory plants may include diseased, unsatisfactory appearance, insect infestation, otherwise stressed or any condition which prevents thorough inspection.

**Special notes:**

A. Greenhouse production – For certification purposes, a greenhouse will be identified as a single “field.” This should match the warehouse information given to ODA.

B. ~~Growers will be required by Federal or local regulations to obtain THC test results from a recognized laboratory verifying that the THC content of their hemp crop complies with applicable regulations. Growers shall be required to submit these results to OSCS to complete seed certification, and the results will be verified with ODA.~~ Growers may be required by OSCS to obtain and submit additional testing before the seed can be certified. In addition, growers must meet all applicable State and Federal requirements.

C. Growth facility must only contain certified hemp production.

## **Hemp Certification and Foundation Seed and Plant Materials Advisory Committee Bylaws**

### **Article I. Name and Location**

The name shall be the Hemp Certification and Foundation Seed and Plant Materials Advisory Committee (shortened version: Hemp Certification Advisory Committee). The principal office and place of business shall be in the College of Agriculture, Oregon State University.

### **Article II. Objective**

The objectives of the Advisory Committee are set forth as follows:

1. To promote and improve hemp seed by developing high quality seed certification standards.
2. To advise and cooperate with the Oregon State University Certification and Foundation Seed and Plant Materials Board by recommending changes to the Board which are in the best interest of the hemp industry of Oregon.
3. To aid in the dissemination of information affecting Oregon hemp growers and dealers by working through their respective organizations.

### **Article III. Membership**

1. The advisory Committee shall consist of 11 voting members, representing the different growing regions of the state, and will include breeder, grower, and processor representatives as well as OSU researchers. Of the breeder, grower, and processor representatives, two will be from the Willamette Valley, two will be from Southern Oregon, one will be from Central Oregon, one will be from the Columbia Basin, one will be from Northeast Oregon and one will be from Southeastern Oregon. Representing the OSU researchers, one will be a hemp researcher, one will be an OSU weed specialist, and one will be an OSU plant pathologist. The following shall serve as non-voting ex-officio members: Crop and Soil Science Department Head, Director of Seed Services, Certification Project Manager, Seed Laboratory Manager, a representative of the Oregon Department of Agriculture, a representative of the Global Hemp Innovation Center and such other ex-officio members the Dean or the Committee shall deem necessary.
2. Until established industry organizations are operational, Representatives of the Committee shall be appointed by the OSU Hemp Stewardship Committee according to the regional needs operating in the best interest of the hemp industry.
3. If a vacancy occurs before established industry organizations are operational, the OSU Hemp Stewardship Committee or the Dean may appoint appropriate representatives.

### **Article IV. Term of Membership**

1. The representatives shall be appointed to serve a three-year term. To initiate the committee the first year, position one from the Willamette Valley region, position one from the Southern Oregon region, and the Central Oregon representative shall be appointed for one year. The Columbia Basin, the Southeast Oregon, and position two from the Southern Oregon region shall be appointed for two years. The Northeast representative and position two from the Willamette Valley region shall be appointed for three years. Re-appointment for an additional term is permissible, but whenever possible, new individuals should be appointed.
2. The OSU hemp researcher, OSU weed specialist, and OSU pathologist shall serve at the Dean's discretion.

### **Article V. Officers**

1. Officers shall consist of a chair and vice-chair. Each will serve a one-year term. The vice-chair will become chair. If the first chair is a breeder, the vice-chair will be a grower. For selecting a

breeder for alternating terms, the processor will be considered part of the breeder group. After the first year, the breeders and growers will be represented as chair on alternate years. The Hemp Stewardship committee shall appoint the first chair and vice-chair of the Hemp Certification Advisory Committee.

2. A secretary shall be chosen by the Dean and may or may not be a member of the committee.

**Article VI. Meetings**

1. The committee shall meet at least once a year.
2. Special meetings may be called by the chair as is deemed necessary.
3. Meeting notices shall be mailed 20 days before each annual meeting. The secretary shall mail or email a notice to each member. Notices of special meetings shall state the nature of the business to be considered. Minutes of each meeting will be forwarded to each appointing organization and each member of the Advisory Committee and the Board within 20 days before the next meeting.
4. The voting members present shall constitute a quorum of the transaction of business at any officially called meeting.

**Article VII. Amendments**

These bylaws may be amended at any officially called committee meeting by a two-thirds affirmative vote of the members present, subject to the Board's approval.

Oregon State University Extension Service prohibits discrimination in all its programs, services, activities, and materials on the basis of race, color, national origin, religion, sex, gender identity (including gender expression), sexual orientation, disability, age, marital status, familial/parental status, income derived from a public assistance program, political beliefs, genetic information, veteran's status, reprisal or retaliation for prior civil rights activity. (Not all prohibited bases apply to all programs.)

# Seed Certification, Foundation Seed and Plant Materials Board Update

## February 16, 2022



### Seed Regulatory Program Updates

#### Kentucky 31 Investigation

- The department reached a settlement with Dynamic Seed Source, LLC and Trevor Abbott on May 6, 2021. Both Dynamic and Abbott agreed to pay \$150,000 each in civil penalties to the department and Dynamic’s wholesale seed dealer’s license was suspended for one year, effective July 1, 2021.

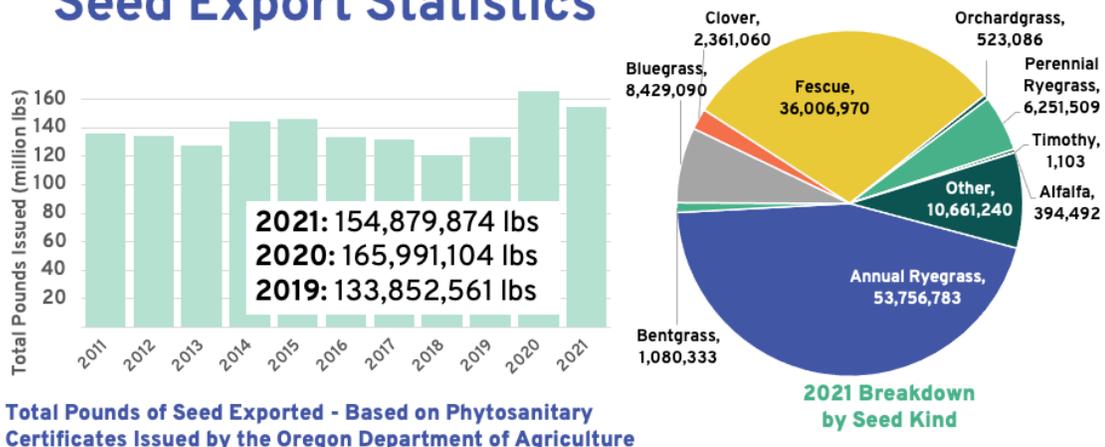
#### 2022 Rulemaking Plans

- Price Negotiation Rules (OAR 603-076-0005 to 0016)
  - Goal: clarify process to better meet participant needs and improve negotiations for all parties
- Sod Quality Rules (OAR 603-056-0130 to 0145)
  - Goal: harmonize standards with Washington and Idaho, simplify process for getting tags; allow for interagency tags
  - Presentation with comparisons between OR, WA, and ID and proposed standards is attached.

#### Export Statistics

- Please see attached summary documents.

### Seed Export Statistics



# Sod Certification Standards

*Making updates to standards, rules, & process*



1

## Background

- Harmonizing standards between OR, WA, and ID
  - Interagency tags a possibility
- Streamlining process
  - Removing unnecessary steps
  - Easier to get tags printed
- Updating standards and rule language
  - Standards – last updated in 2011
  - Applications, fees, and procedures – last updated in 2000



2

## Sod Quality Rule Comparisons

	Oregon	Washington	Idaho
Tag Issuing Authority	Oregon Department of Agriculture OAR 603-056-0130 to 0145	Washington State Department of Agriculture (WSDA) WAC 16-302-410 and WAC 16-303-515	Idaho Crop Improvement Association
Requires formal rule change to update?	Yes	Yes	No
Fees (tags)	\$0.20 per tag	\$0.25 per cwt; minimum fee: \$13	
Testing lab	Oregon State University Seed Lab \$63 (min) to \$235; charges vary based on amount searched	WSDA Seed lab Bluegrass - \$81.00 Fescue - \$56.00 Ryegrass - \$45.00	ISDA Seed lab Bentgrass - \$66.00 Bermudagrass - \$64.00 Bluegrass - \$64.00
Sod seed analysis fees	\$25 – produce Sod report from existing CW  <a href="https://seedlab.oregonstate.edu/testing-services/testing-fees">https://seedlab.oregonstate.edu/testing-services/testing-fees</a>	WAC 16-303-210	IDAPA 0.2.06.01, pg 17-20



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## Sod Quality Rules - Other Crop Comparison

Seed Kind	State		
	OR	WA	ID
Alkaligrass			X
Bentgrass	X	X	X
Bermudagrass			X
Big Bluegrass	X		X
Black medic		X	X
Clover	X	X	X
Meadow foxtail		X	X
Orchardgrass	X	X	X
Poa trivialis	X	X	X
Puccinella spp.			X
Reed canary grass	X	X	X
Ryegrass	X	X	X
Smooth bromegrass	X		X
Tall fescue	X	X	X
Timothy	X	X	X

Seed kinds considered to be "other crop" by state.

Kind	Maximum Other Crop			Other Requirements
	OR	WA	ID	
Perennial Ryegrass	0.1%	0.1%	0.1%	
Merion Kentucky Bluegrass	0.1%	0.1%	0.1%	OR, ID: 2% allowance for other bluegrass varieties; OR, WA, ID: 0.02% for Canada bluegrass.
Other varieties of Kentucky bluegrass	0.1%	0.1%	0.1%	
Red fescue	0.1%	0.1%	0.1%	ID: Red and Chewings fescue must be free of Canada bluegrass
Chewings fescue	0.1%	0.1%	0.1%	
Hard fescue	0.1%	NA	NA	
Sheep fescue	0.1%	NA	NA	
Blue fescue	0.1%	NA	NA	
Bentgrass	0.1%	NA	NA	OR: 500 seed count for other Agrostis spp.
Tall fescue	0.1%	0.1%	0.1%	

Maximum percentage of other crop allowed in each seed kind and other kind-specific requirements.



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## Sod Quality Rules - Weed Seed Comparison

Weed Seeds	State			Other Requirements and Exceptions
	OR	WA	ID	
Dock ( <i>Rumex</i> spp.)	X	X	X	<b>WA:</b> also includes noxious weeds as listed under WAC 16-302-100 and 16-302-105 For ryegrass, allows an additional 0.07% of weed <i>Bromus</i> spp.  <b>ID:</b> "and all weeds prohibited (See Prohibited Noxious Seed List)" *All species of <i>Bromus</i> ** <i>Vulpia myuros</i> (rattail fescue)
Chickweed ( <i>Cerastium</i> spp.)	X	X	X	
<i>Stellaria media</i>	X	X		
Crabgrass ( <i>Digitaria</i> spp.)	X	X	X	
Plantain ( <i>Plantago</i> spp.)	X	X	X	
Black medic ( <i>Medicago lupulina</i> )	X			
Annual bluegrass ( <i>Poa annua</i> )	X	X	X	
Velvetgrass ( <i>Holcus</i> spp.)	X	X	X	
Downy brome ( <i>Bromus tectorum</i> )	X		X*	
Other all-state noxious, except HI	X		X	
Big Bluegrass ( <i>Poa secunda</i> )		X		
Canby Bluegrass ( <i>P. secunda</i> ssp. <i>Canbyi</i> )		X		
Sandberg Bluegrass ( <i>P. secunda</i> )		X		
Short-awn foxtail ( <i>Alopecurus aequalis</i> )		X	X	
<i>Vulpia</i> spp.		X	X**	

When listed in a state's Sod Quality standards, maximum weed seed is 0.02% for all seed kinds except for bentgrass (OR), which is 0.01%



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## Sod Quality Rule Comparisons

Kind	Size (g)			Minimum purity (%)			Minimum germination (%)			Maximum other crop*1			Maximum weeds *5			Other Requirements
	OR	WA	ID	OR	WA	ID	OR	WA	ID	OR	WA	ID	OR	WA	ID	
Perennial Ryegrass	50	50	25	98%	98%	98%	90%	90%	90%	0.1%	0.1%	0.1%	0.02%	0.02%	0.02%	OR: Certification fluorescence levels and appropriate calculation will be applied when determining levels of other crop. WA: Max fluorescence levels as determined by breeder or variety owner; 85% min germ allowed on ryegrass varieties as designated by breeder/variety owner; Seed program maintains list
Merion Kentucky Bluegrass	25	25	25	95%	97%	96%	80%	80%	80%	0.1%	0.1%	0.1%	0.02%	0.02%	0.02%	OR, ID: 2% allowance for other bluegrass varieties; OR, WA, ID: 0.02% for Canada bluegrass.
Other varieties of Kentucky bluegrass	25	25	25	97%	97%	97%	80%	80%	80%	0.1%	0.1%	0.1%	0.02%	0.02%	0.02%	
Red fescue	30	50	25	98%	98%	98%	90%	90%	90%	0.1%	0.1%	0.1%	0.02%	0.02%	0.02%	ID: Red and Chewings fescue must be free of Canada bluegrass
Chewings fescue	30	50	25	98%	98%	98%	90%	90%	90%	0.1%	0.1%	0.1%	0.02%	0.02%	0.02%	
Hard fescue	20	NA	NA	98%	NA	NA	85%	NA	NA	0.1%	NA	NA	0.02%	NA	NA	
Sheep fescue	20	NA	NA	98%	NA	NA	85%	NA	NA	0.1%	NA	NA	0.02%	NA	NA	
Blue fescue	20	NA	NA	98%	NA	NA	85%	NA	NA	0.1%	NA	NA	0.02%	NA	NA	
Bentgrass	2.5	NA	NA	98%	NA	NA	85%	NA	NA	0.1%	NA	NA	0.10%	NA	NA	OR: 500 seed count for other <i>Agrostis</i> spp.
Tall fescue	50	50	25	98.5%	98%	98.5%	85%	85%	85%	0.1%	0.1%	0.1%	0.02%	0.02%	0.02%	

Equal Greater Less

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## Sod Quality Rule Comparisons

Kind	Size (g)			Minimum purity (%)			Minimum germination (%)			Maximum other crop*1			Maximum weeds *5			Other Requirements
	OR	WA	ID	OR	WA	ID	OR	WA	ID	OR	WA	ID	OR	WA	ID	
Perennial Ryegrass	50	50	50	98%	98%	98%	90%	90%	90%	0.1%	0.1%	0.1%	0.02%	0.02%	0.02%	OR: Certification fluorescence levels and appropriate calculation will be applied when determining levels of other crop. WA: Max fluorescence levels as determined by breeder or variety owner; 85% min germ allowed on ryegrass varieties as designated by breeder/variety owner; Seed program maintains list
<del>Merion Kentucky Bluegrass</del>	<del>25</del>	<del>25</del>	<del>25</del>	<del>95%</del>	<del>97%</del>	<del>96%</del>	<del>80%</del>	<del>80%</del>	<del>80%</del>	<del>0.1%</del>	<del>0.1%</del>	<del>0.1%</del>	<del>0.02%</del>	<del>0.02%</del>	<del>0.02%</del>	OR, ID: 2% allowance for other bluegrass varieties; OR, WA, ID: 0.02% for Canada bluegrass.
Other varieties of Kentucky bluegrass	25	25	25	97%	97%	97%	80%	80%	80%	0.1%	0.1%	0.1%	0.02%	0.02%	0.02%	
Red fescue	30	30	30	98%	98%	98%	85%	85%	85%	0.1%	0.1%	0.1%	0.02%	0.02%	0.02%	ID: Red and Chewings fescue must be free of Canada bluegrass
Chewings fescue	30	30	30	98%	98%	98%	85%	85%	85%	0.1%	0.1%	0.1%	0.02%	0.02%	0.02%	
Hard fescue	20	NA	NA	98%	NA	NA	85%	NA	NA	0.1%	NA	NA	0.02%	NA	NA	
Sheep fescue	20	NA	NA	98%	NA	NA	85%	NA	NA	0.1%	NA	NA	0.02%	NA	NA	
Blue fescue	20	NA	NA	98%	NA	NA	85%	NA	NA	0.1%	NA	NA	0.02%	NA	NA	
Bentgrass	2.5	NA	NA	98%	NA	NA	85%	NA	NA	0.1%	NA	NA	0.10%	NA	NA	OR: 500 seed count for other Agrostis spp.
Tall fescue	50	50	50	98%	98%	98%	85%	85%	85%	0.1%	0.1%	0.1%	0.02%	0.02%	0.02%	

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## Proposal for New Sod Quality Standards

- Remove Merion Kentucky bluegrass
- Standardize sample sizes (Perennial ryegrass, Chewings fescue, red fescue, tall fescue)
- Harmonize purity for tall fescue (reduce OR & ID by 0.5% to 98%)
- Germination for Chewings and red fescues – reduce to 85%
- Weed seeds – is there a need to list all species? Refer to all-states noxious?
- Other crop – harmonize lists



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## Example Rulemaking Timeline

Date	Rulemaking Activity	Note
January – April	Rule Advisory Committee Meetings	Virtual meetings
April 13, 2022	Last day to notify legislators	Must be at least 49 days prior to effective date
April 18, 2022	Last day to notify interested parties of hearing date	Must be at least 28 days prior to hearing date
May Issue	Submit to the Oregon Bulletin	Submit at least 1 week prior to May 1
May 1, 2022	Publish in Oregonian	14 days prior to hearing date; 28 days prior to effective date of rule
May 16, 2022	Public Hearing	Virtual hearing; can waive if
May 20, 2022	Last day for public comment	After hearing; if hearing is waived, 21 days after public notice
June 1, 2022	Effective Date of Rule	



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## Next Steps

- Agreement on standards between Oregon, Washington, & Idaho
  - How will interagency tags work?
- ODA will work with OSU Seed Certification on a new process for issuing tags
- For Oregon (rulemaking process):
  - Send a letter to ODA asking for change a review of rule to update the sod standards and harmonize with WA and ID
  - ODA will draft new rule language and possibly convene a rules advisory committee (RAC) to review final language
  - ODA will begin administrative rulemaking process

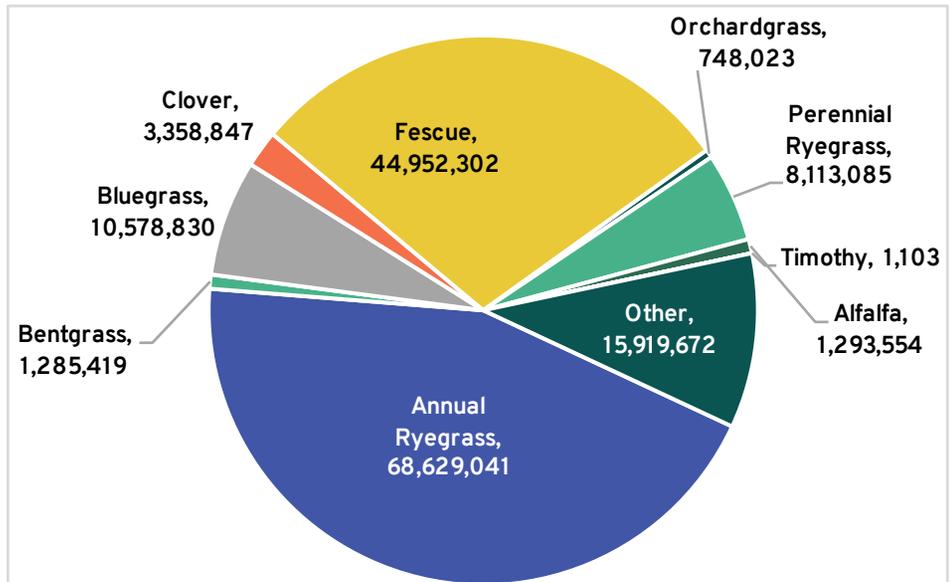
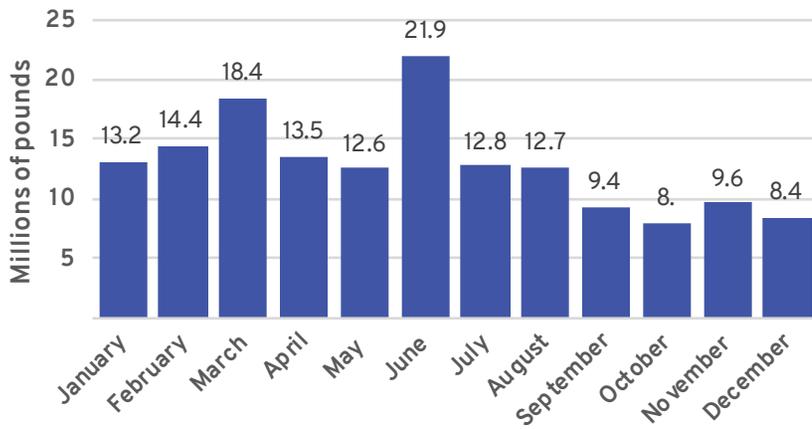


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### Seed Phytosanitary Certificates Issued 2021 (pounds)

Month	Annual Ryegrass	Bentgrass	Bluegrass	Clover	Fescue	Orchardgrass	Perennial Ryegrass	Alfalfa	Timothy	Other	Total Pounds
January	5,220,767	185,954	959,872	303,851	3,787,732	20,191	790,563			1,906,604	13,175,534
February	3,649,281	69,789	1,301,791	284,112	6,489,889	90,203	610,640			1,909,496	14,405,201
March	6,678,741	141,251	1,273,079	502,071	6,647,474	58,508	666,403	110,002	1,103	2,323,534	18,402,166
April	5,378,194	363,060	653,451	319,790	5,128,882	27,001	970,854	85,366		620,408	13,547,006
May	5,750,213	67,845	416,409	184,641	4,369,773	121,100	895,616			745,983	12,551,580
June	12,737,053	85,891	1,854,013	585,305	4,913,769	97,396	862,185	113,758		649,714	21,899,084
July	6,676,176	152,781	902,746	134,945	3,178,972	32,651	750,421			935,150	12,763,842
August	7,666,358	13,762	1,067,729	44,801	1,490,479	76,036	704,827	85,366		1,571,897	12,721,255
September	4,061,502	30,264	796,424	118,658	1,322,483	47,790	190,902	5591		2,782,834	9,356,448
October	2,596,999	52,662	418,611	282,492	2,178,323	59,680	840,187	44092		1,556,285	8,029,331
November	4,118,788	61,647	373,049	505,297	3,436,769	85,415	363,890	39683		663,223	9,647,761
December	4,094,969	60,513	561,656	92,884	2,007,757	32,052	466,597	809696		254,544	8,380,668
<b>Totals</b>	<b>68,629,041</b>	<b>1,285,419</b>	<b>10,578,830</b>	<b>3,358,847</b>	<b>44,952,302</b>	<b>748,023</b>	<b>8,113,085</b>	<b>1,293,554</b>	<b>1,103</b>	<b>15,919,672</b>	<b>154,879,876</b>

2021 Seed Phytosanitary Certificates Issued



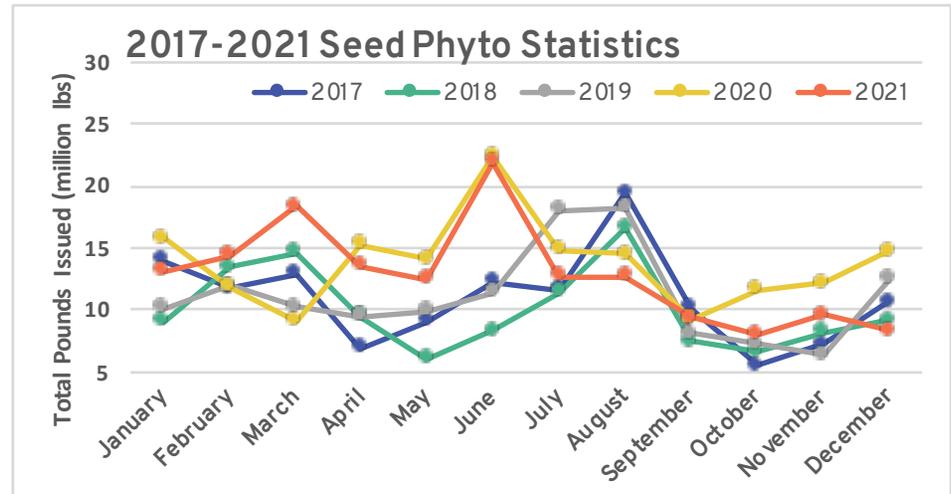
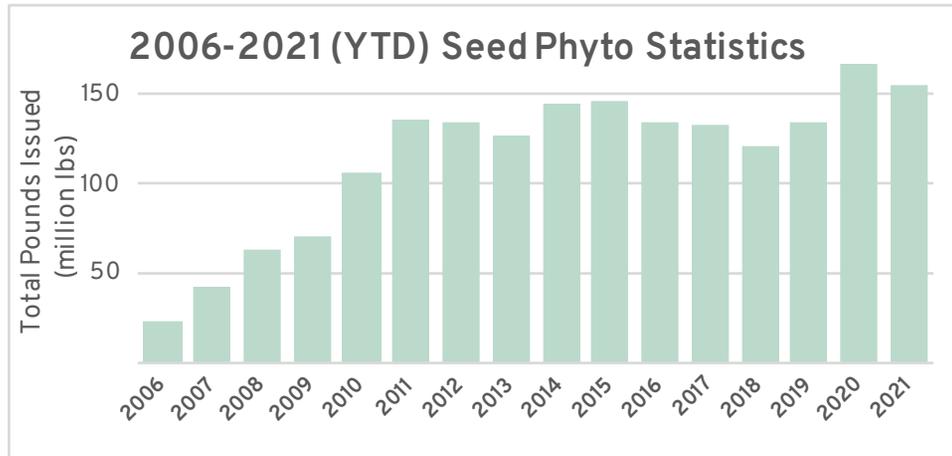
Volume (lbs)	Seed Kind										
	Country	Alfalfa	Annual Ryegrass	Bentgrass	Bluegrass	Clover	Fescue	Orchardgrass	Other	Perennial Ryegrass	Grand Total
Argentina			2,602	3,151	12,111	209,786	670,167		126,504	5,573	1,029,894
Australia			6,241,632	29,814	133,468	178,563	699,347	2,201	123,777	10	7,408,812
Canada					3		3,307		1,642,749	6	1,646,065
Central & South America	905,471		1,445,849		18,688	351,649	102,310	558,087	520,389	591,295	4,493,738
Chile			3,299,853	5,552	17,307	422,900	1,265,531	41,851	46,311	398,595	5,497,900
China	110,001		21,982,760	263,100	7,164,674	1,042,721	30,705,467		1,636,126	2,079,967	64,984,816
Colombia			463,900	1,000		73,100	26,000	10,000	1,966,300	431,470	2,971,770
European Union	1		12,118,362	684,862	2,063,684	624,913	7,729,305	3,615	4,898,296	1,192,274	29,315,312
Japan	5,591		1,707,797	119,751	163,456	197,485	415,951	22,100	234,040	895,509	3,761,680
Korea, Republic of			14,251,060	132,221	698,680	21,013	1,163,098	78,033	3,330,340	770,605	20,445,050
Mexico			2,296,805	1,028	7,000	5,977	275,002	31,750	286,501	169,200	3,073,263
New Zealand	74,075			3,903	701	88,450	580,554	386	686	43,755	792,510
Other	198,415		2,146,757	14,435	297,496	61,651	1,262,678		696,820	1,487,607	6,165,859
Other Asia			2,671,664	3,802	1,562	2,500	53,585		483,113	47,219	3,263,445
United States				22,800					6,962		29,762
<b>Grand Total</b>	<b>1,293,554</b>		<b>68,629,041</b>	<b>1,285,419</b>	<b>10,578,830</b>	<b>3,280,708</b>	<b>44,952,302</b>	<b>748,023</b>	<b>15,998,914</b>	<b>8,113,085</b>	<b>154,879,876</b>

Data through December 31, 2021

# Seed Phytosanitary Certificates Summary Data - By Month and Year (pounds)

	January	February	March	April	May	June	July	August	September	October	November	December	TOTALS
2005	2,189,753	3,063,005	4,342,943	1,106,521	2,285,409	1,985,485	1,310,384	1,676,733	1,042,235	250,257	1,606,980	763,547	21,623,252
2006	454,664	635,843	1,608,216	1,322,833	1,140,373	2,258,771	1,165,801	1,903,722	2,911,423	2,940,958	3,551,165	3,485,050	23,378,819
2007	5,041,737	3,958,794	3,703,147	2,577,687	1,873,022	2,781,983	2,732,831	4,111,166	2,486,030	2,662,651	3,974,573	6,610,992	42,514,613
2008	8,366,218	5,441,006	5,220,102	4,785,036	6,918,967	5,849,781	5,863,403	3,914,533	4,919,935	3,467,345	2,619,047	5,142,753	62,508,126
2009	6,943,769	9,146,212	4,650,232	3,948,935	3,805,521	7,108,558	5,562,247	6,350,347	3,081,679	4,069,966	6,865,900	9,034,488	70,567,854
2010	9,892,983	12,073,939	7,059,612	8,507,988	9,767,843	8,093,539	7,392,918	10,661,252	10,141,460	6,044,373	7,054,854	8,962,288	105,653,049
2011	12,871,103	17,817,187	15,314,916	10,698,778	6,730,506	10,766,203	9,186,704	12,674,719	8,104,300	9,160,109	9,575,960	12,826,858	135,727,343
2012	12,432,275	19,069,854	12,770,195	11,443,386	12,804,475	8,416,595	7,583,057	11,783,582	8,684,430	5,937,222	9,920,305	13,210,445	134,055,821
2013	11,302,240	14,854,795	7,975,859	8,285,587	10,870,276	8,791,361	12,210,267	11,628,591	8,432,416	9,602,159	8,171,143	15,056,695	127,181,389
2014	14,360,278	17,167,086	15,072,400	10,564,872	10,679,686	13,103,991	12,147,360	15,520,909	7,954,975	7,857,133	8,222,512	11,490,409	144,141,611
2015	11,070,922	9,922,858	14,159,177	15,839,551	15,325,975	8,852,314	19,932,767	11,623,747	9,779,375	10,234,152	9,784,739	9,563,410	146,088,987
2016	10,409,453	11,036,866	9,051,334	10,836,992	12,659,318	15,158,889	14,536,366	12,930,361	7,625,186	7,632,429	7,306,971	14,482,072	133,666,237
2017	14,024,647	11,767,232	12,889,771	6,967,757	9,099,129	12,334,602	11,688,142	19,495,269	10,202,964	5,584,921	7,231,746	10,667,294	131,953,474
2018	9,126,464	13,466,635	14,649,303	9,559,715	6,046,591	8,319,407	11,399,196	16,639,474	7,482,024	6,620,886	8,277,573	9,172,362	120,759,630
2019	10,141,086	11,928,706	10,246,107	9,502,400	9,895,020	11,451,146	18,105,578	18,243,496	8,118,403	7,305,990	6,405,657	12,508,972	133,852,561
2020	15,783,097	11,891,123	9,106,583	15,259,570	14,132,478	22,415,278	14,828,147	14,593,765	9,308,287	11,637,682	12,227,940	14,807,154	165,991,104
2021	13,175,534	14,405,201	18,402,166	13,547,006	12,551,580	21,899,084	12,763,842	12,721,253	9,356,448	8,029,331	9,647,761	8,380,668	154,879,874

Grey highlights represent bienniums



### Seed Services Update

Seed Certification, Foundation Seed & Plant Materials Board Meeting

February 16, 2022

- We are in our third year of increasing Gulf breeder seed. The first-year project was completed in 2019 and the 2020 work was put on hold due to the pandemic. Last year we completed the second year of seed increase, and the team hopes to have a small amount of Gulf breeder seed available this fall.
- The Tall Fescue Commission will be increasing the amount of breeder seed of Kentucky 31. It is hoped that we should have an increase of Foundation K31 ready to be purchased by the fall of next year and more seed available in 2024.
- Members of an ISTA sub-committee have found genes that would indicate flowering in ryegrass. The next step is to develop protocols for a test that could tell the difference between perennial and annual ryegrass. Primers and protocols will be sent to some labs to see if an effective test can be developed. If successful, we will introduce the method into the ISTA and AOSA rules.
- A team of researchers are working to use computer vision, neural networks, and robotics to develop a prototype machine that could be used to sort off-type seed from pure grass seed. Currently, an undergraduate student is working on training the Neural Network to distinguish between ryegrass and tall fescue. We have applied for a Specialty Crops Grant that would support further work. If the proposal is funded, we will begin the new research starting in October.



**Andrew Altishin**

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## 2021 Year in Review

**Total Acres Certified of all Crops – 229,047 (-3%)**

**Total Acres of Grass Crops Certified – 190,390 (-5.2%)**

Tall fescue – 104,882 (-7.9%)

Perennial ryegrass – 34,677 (5.9%)

K. Bluegrass – 15,064 (-0.5%)

Annual ryegrass – 9,049 (-12%)

Chewings fescue – 6,584 (-3%)

**Total Acres of Small Grains Certified – 22,568 (5.3%)**

**Total Acres of Legumes Certified – 6,429 (38.1%)**

Red clover – 3,303 (51.2%)

Crimson clover – 1,022 (22.1%)

Total Acres of Misc. Other Crops Certified – 9,660 (<1%)

Radish – 1,409 (-53.3%)

Total Acres of Potatoes Certified – 3,052 (2.5%)

Total Acres of PVG Certified – 41 (-55.4%)

Total Acres of Corn – 2,497 (-5.3%)

**Active Warehouses in 2021 - 190**

**Active Growers in 2021 – 670**

### New Hires

- Mel Laam, Office Manager, OSCS Main Office
- Mason McKinney, Seed Certification Specialist (Polk Co., small grains support), OSCS Main Office
- Craig Agidius, Seed Certification Specialist (Benton Co., Corn program coordinator trainee), OSCS Main Office
- Kirsten Bradford, Program Representative, OSCS Main Office
- Tami Brown shifted responsibilities to take over the hemp program and the potato program.
- Open Positions
  - o Linn County Sampler – Filled Jennifer Vahl
  - o Union County Sampler
- Still operating under Covid-19 protocols (main office and select extension offices closed to



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the public or following reduced in-person interactions).

- Continuing encouragement of online sign-up processes and credit card usage.

**New Fees - July 1<sup>st</sup>, 2022**

- A minimum charge fee will be assessed if a sampler is unable to sample due to a lot not being accessible or prepared for sampling.
- Rush fee for delivery of tags.

**OSCS Staffing**

- 3 Administrative staff
- 2 Information Technology Staff
- 7 Seed Certification Specialists
- 6 Part-time/seasonal Seed Certification Specialists
- 8 Seed Certification Samplers
- 1 Manager and Seed Certification Specialist
- Various part-time student employees

## OSU Seed Lab Report

### to all Certification Advisory Committees

Recently, the Lab successfully completed their 3-year ISTA audit. The audit took place the end of July— responses to findings were issued back to the ISTA offices the week before Thanksgiving. On the morning of 22 Nov we were notified that our audit had been accepted by the auditors and would be submitted to the Executive Committee for their approval. Celebratory cake was enjoyed by the Lab staff (thanks to Dan Curry) 10 Dec. (ISTA accounts for ~20% of OSU Seed Lab samples.)

Regarding samples numbers. Due to the low yields and poor harvest this past season, the sample counts at the Lab are behind the 5-yr. average by about 25% (3009) as of mid-February. We are hopeful that the numbers will stabilize over the next few months.

Consequently our budget is also negative. We are doing okay for now.

Personnel: the OSU Seed Lab is down 1 Bio-Technician, 4 Analyst I's, and an Administrative Program Assistant right now. We are having a hard time competing with the fast-food industry for laborers. Of the 5 that have left, one took a job in the seed industry, two moved with their families, one was promoted to another position in the Lab and one took a position at another type of laboratory.

This year we had a hard time finding temporary help for pre-picker positions and did not have anyone stay for further training.

In January we reviewed hiring strategies for analyst positions, including, reclassification of positions, targeting a different audience for potential analysts and reaching out to area community colleges and schools to collaborate in providing work experience. We are looking into the use of interns and have posted an opening for Analyst 1 & 2.

In November Lorinda Hughes was promoted as our new Quality Manager. Lorinda was extremely helpful in completing our ISTA audit successfully.

Last month, the Seed Lab received a letter from the Bureau of Land Management requiring USDA/ASL accreditation for all labs that test their seeds. Over the past several years there has been concern regarding variable results from several of the labs doing business with them. OSU reached out to USDA to see if they would grant accreditation based on our ISTA audit results. They were not willing to grant that, so we have scheduled an audit with USDA sometime in the next couple months. BLM was contacted to determine if they would accept ISTA accreditation. BLM has responded that they will accept ISTA accreditation. They are in the process of communicating that to their work partners.

Attached:  
Preliminary report on Ploidy Review.

## Ploidy testing at OSU Seed Lab

### Issue / Problem:

There is an issue with repeated ploidy tests not having consistent results. It appears that when the Lab reports failing results and the customer calls, they come to understand the customer needs and then the next test meets those needs.

### Potential root causes:

- Error in methods.
- Lab tested to the wrong standard (for instance, they tested to Certified standards rather than Foundation standards).
- Sampling statistical variability.
- Statistical variability in test results.

### Investigation into each of the root causes:

#### Error in methods.

Initially when these issues came up, the Special Testing unit investigated whether there were errors being committed in the methods.

Extraction—methods were verified by the Lab Manager. Each process was done in a controlled manner to reduce potential for variability. (Size of clipping, time spent chopping, quantity of solutions, etc.)

Equipment—methods are standardized for all samples. Equipment is routinely cleaned and other maintenance performed.

Interpretation of results—an error was found. The incorrect equations were used approximately 50% of the time. Training was performed and processes were modified to ensure that the correct equations are used.

Overall—Over 100 samples were selected randomly (but including samples for which there were problems earlier identified) and all test records were submitted to an OSU Scientist that worked in genome analysis and an OSU Statistician. No report was ever received from the Genome Specialist, even after repeated attempts to contact him. (It was later determined that he was relieved of his responsibilities at OSU. We were not made aware of this until we read it in the newspaper.)

Communication with the Statistician will be reviewed below.

Lab tested to the wrong standard (for instance, they tested to Certified standards rather than Foundation standards).

At least one incident was found where Certified standards were applied to Foundation that resulted in results being interpreted incorrectly. When the customer received these results the test indicated that the seed lot met Certification standards when in fact they did not.

Training was held to increase awareness of the importance of verifying seed class.

#### Sampling statistical variability.

Contaminants that occur at a low frequency are difficult to test for because of sampling variability. As a common example of this variability, if we look at the standard germination test we can view a large amount of variability. A test result of 95% allows a range of 9 between 4 100-seed replicates, 90% allows 12, and 80 allows 16.

In order to keep costs low only a small amount of seed is tested. In a ploidy test we are only testing 200 seeds routinely. If 95% ploidy is required, a tolerated range of 7 between tests may be expected due to random variability. In other words, if our expectation is that the ploidy result of a given seed lot is 95 and we test, we can expect a result within the range from 91-98. If the result is higher than 98, we are statistically confident that the actual ploidy level is better than 95. In the same manner, if the result is below 91, we are statistically confident that the seed lot is below 95.

This variability is due to sampling variability at the warehouse and within the Lab combined.

#### Statistical variability in test results.

In the same way there is variability due to sampling, there is also a small amount of variability due to the test methods. We generally lump this together with sampling variability when we analyze seeds. In the ploidy test, methods are controlled by the analyst in using and following the procedure precisely and when test equipment is maintained and kept clean. (Human error, bias and variability is discussed in the section on Error in methods. It will be looked at further in Current Initiatives.)

#### Communication with OSU Statistician

We received the following from Dr. Di.

**From:** Di, Yanming <[Yanming.Di@oregonstate.edu](mailto:Yanming.Di@oregonstate.edu)>

**Sent:** Monday, April 26, 2021 9:13 PM

**To:** Elias, Sabry <[Sabry.Elias@oregonstate.edu](mailto:Sabry.Elias@oregonstate.edu)>

**Subject:** RE: Ploidy Evaluation

*Hi Sabry,*

*I now understand the general steps:*

- 1. The seed grower first needs to draw a random sample from their lot. It's important that this sample is representative of their lot, but the seed lab does not have control over this step. There will be small amount of sampling variation, but since the total number of seeds is quite big, the uncertainty due to sampling should be quite small: it is more important that the seed growers understand the general techniques on how to draw a sample.*
- 2. Once in the lab, the seed lab will perform some purity test, and then draw a small sample of 200 seeds. The sampling was drawn using the Gamet divider: then it should be*

close to a random sample. However, since only 200 seeds will be sampled: the sampling error can be remarkable. For example, if there are 5% of seeds are diploid in bag of tetraploid seeds, in a sample 200 seeds, it will be quite common to see either 6 diploids or 14 diploids (3-7%). But the sampling error will be much less, if, e.g., there is only 1% of impurity; and the sampling error will be greater if there are higher percentage of impurity.

3. Once the seeds have been sampled, in the steps of growing the seedlings and extracting DNA materials from groups of 20 seedlings, I don't see obviously sources of variation.
4. Finally, in the flow cytometry step, there can be a small amount of variation due to the natural variation in the cell cycles. My impression is that the variation here should be much smaller as compared to the sampling errors. For the flow cytometry step, if one really need to know how much variation is there, one can, e.g., try replicates of spiked samples of 20 seedlings. You mentioned that seed lab had already measured the spiked samples before. I think it is should be possible to give some types of uncertainty quantification based on results from those spiked samples.

One question I forgot to ask the other, I noticed that in some samples the lab tested using the flow cytometry machine, there are 5 or 10 seedlings (instead of 20), does the same formula apply or a different formula is need to infer the number of diploid seeds?

My guess is that if one uses 5 seedlings group, it will make detecting the diploid easier? But then the total number of seeds one can test is less, so the sampling error as percentage of the total number of seeds tested will increase. It is hard to know which group size is ideal.

Best,

Yanming

Our response to Yanming.

**From:** Elias, Sabry

**Sent:** Tuesday, April 27, 2021 10:59 AM

**To:** Di, Yanming <[Yanming.Di@oregonstate.edu](mailto:Yanming.Di@oregonstate.edu)>

**Subject:** RE: Ploidy Evaluation

Hello Yanming,

- Based on the results of the actual spiked samples, the uncertainty in test results is approximately  $\pm 1\%$ , only in contaminated samples. In one of our AOSA tolerance tables, the tolerance for 0 is 2, i.e., we can report 0 contamination, and if we find 2 contaminating seeds, it is still within tolerance. This is because of the very small samples we test compared to the large seed lot that can be up-to 55,000 lbs.
- In our previous SOP's protocol, we use to run 5 replications of 20 seedlings each during the busy season for only either if the 5 replications had high ploidy level (99-100%) seeds as our research indicated that the probability to get less than 95% (the passing zone) in

*the next 5 reps is very minimal. Also for samples that scored 60-80% in the first 5 replications, they cannot reach 95% even if the next 5 replications were 100%. For samples that gave us 85-94% we run 10 replications.*

- *Our new SOP's is to run 10 reps of 20 seedlings each (total 200 seedlings) in all samples.*
- *In some difficult species such as hemp, trees, and watermelon where the cell division may be slow, our research indicated that running 10 seedlings instead of 20 detect and contamination in a higher accuracy level. However, in grasses 20 seedlings works fine.*
- *Our ploidy calculation formula, has a build-in function to adjust the number of seedlings we run, i.e., 20, 10, or different numbers of seedlings.*

*Thank you,*

*Sabry*

### Current Initiatives

We were requested to organize a referee within the seed industry. We reached out to all the major service labs that performed testing on ryegrass and found that OSU and Agriseed Testing are the only labs that routinely perform ploidy tests for the seed industry. We reached out to labs in EU and may have found two labs that can do ploidy. We have also identified two other labs at OSU that perform ploidy for other industries.

Our intent follow AOSA and ISTA guidelines for official referees and have 6 labs perform tests on 6-8 spiked samples (0, 1, 5, 10, 20, 100%). The Purity unit will create samples ensuring the blind nature of the test for all labs involved. Spiked samples with identical seed counts will be tested in order to reduce the variability in sampling. Additionally, 2 weighed samples that are contaminated will be tested by all labs to compare the variability in those results with the spiked samples.

Once we receive results back we will analyze variability based on sources of variation.

- Due to sampling
  - Even pure samples can have low level contamination
  - Needs to be high germ to minimize dead seed in tests.
- Due to germination
  - Do we send more than enough seed or do we have them report their germination percentage
- Due to equipment
  - Analytical capability of each machine
  - Self-clean vs. analyst-cleaned
  - Report type (graphic vs. simple number)
  - Sensitivity of equipment
- Due to protocols
  - Pool size
  - Length of growth
  - Length of clipping

- Due to analyst
  - Training
  - Education
  - Following protocols

This referee will be completed later this spring. Data will be analyzed and a full report issued no later than the Grass and Legume Advisory Committee this fall.