

The North Dakota Seed Journal

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Newsletter of the North Dakota State Seed Department

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The North Dakota Seed Journal is published and edited by the Seed Department, State of North Dakota, under the provisions of Chap. 258, S.L. 1931, as administrative and instrumental matter required for effective transaction of the Department's business and for properly fostering the general welfare of the seed industry in the state.

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Joe's Timely Tips

Joe Magnusson, Seed Certification Manager

Certification is all about maintaining varietal identity and genetic purity. Here are some tips for seed growers.

Plant eligible seed on eligible ground

Seed fields cannot be planted on fields that had the same crop the previous year unless it was the same variety and that field was inspected for certification. Foundation and Registered class durum can't be produced on fields that had spring wheat the previous two years. Five years would be better, as we have seen spring wheat volunteer for several years. While permissible by rule, planting on land that previously had an inseparable crop (small grains following other small grain) is not recommended. If this is your only planting option, monitor the field for volunteers. Some crop admixtures can be removed from a seed lot with careful conditioning and appropriate equipment such as an indent or disc machine to remove small or short fractions (wheat from oats and barley etc.).

Apply for field inspection/apply online

Applications for field inspection will be mailed in early May to all growers who have applied for inspection the past two years. Complete and submit the application by the appropriate deadline. Include a copy of a bulk certificate or tag as proof of seed eligibility, an FSA map of the field and the proper fee. Applications are also available in the Online Forms section of our website and at your local Extension office. **New this year**, **you can enter field applications through your secure online account and attach required documentation**.

Isolation is required

A minimum 5-foot isolation strip is required between inseparable crops and different varieties of the same crop. A field will be rejected if the isolation is not in place at the time of inspection. Growers may request a re-inspection after the isolation strip is in place at additional cost.

Weeds of concern

Field bindweed is the most common weed resulting in a failed inspection. It is a prohibited weed and difficult to remove from small grains due to similar size and density. Wild oats in oat and barley fields are also a problem. Thistles are a concern in field peas and crops of similar size. Even though seed of these weeds may not be viable, it is difficult to remove the seed heads from the crop seed. Control these weeds before the inspector arrives to ensure your field will pass inspection.

Clean your equipment

Make sure all your harvest equipment is clean prior to harvest. Simply "flushing" the combine is not an option. We have seen an increase of seed lots that have failed for other crop and varietal admixture this year. Five pounds of seed of another crop or another variety per 1,000 bushels that is not cleaned from harvesting/handling equipment is all that is needed to reject a Registered seed lot for certification; fifteen pounds for a Certified seed lot. If you utilize custom harvesters, don't assume their equipment is clean. Inspect it yourself to be sure. If you don't, they may be introducing contaminants (other crops, other varieties or weeds) into your seed and noxious weeds such as Palmer Amaranth into your fields for years to come.

Joe's Timely Tips continued on page 3

From the **Commissioner's** Desk

My comments in the January edition of the *Seed Journal* focused on a few of our partnerships in the seed industry, primarily associations we most closely connect to the certification and regulatory programs we provide. These partners are essential in offering guidance, standardizing rules and keeping up-to-date on industry advancements in those areas of core responsibilities.

I didn't speak to what is perhaps our closest working partner, NDSU Agriculture. Our staff is engaged with breeders, pathologists, scientists, department chairs and administrators on nearly a daily basis. Crop breeding and variety development, disease identification and testing, weed science, foundation seed; all are examples of the critical scientific and production advancements provided to our industry. I'm often asked if we are a part of NDSU. The quick answer is no; we are a state agency located on campus. The longer answer indicates that our agency is very dependent on working relationships and the workproduct accomplished on campus.

NDSU will be pursuing the replacement of Waldron Hall and associated infrastructure during the 2023 legislative session. These facilities house all crop breeding programs (including potato), agronomy, pathology and disease testing, seed cleaning and storage among a host of other functions. They are old and outdated; we are talking 1940's and 1950's structures. I've heard the term "grossly insufficient" used to describe the space (or lack thereof) and working conditions for scientists and grad students focused on virtually every area important to our Department and the seed industry. Accomplishing a brick-and-mortar funding

Ken Bertsch	State Seed Commissioner
Steve Sebesta	Deputy Seed Commissioner
Kent Sather	Director, Potato Program
Jason Goltz	Field Seed Program Manager
Joe Magnusson	Field Seed Program Manager
Jeanna Mueller	Seed Laboratory Manager
Presley Mosher	Diagnostic Laboratory Manager
Starr Thies	Business Manager
Mike Oosterwijk	Potato Program Supervisor

plan isn't easy, but this one is a no-brainer in terms of a return on investment in the long term health of agriculture in North Dakota.

We'll discuss further in issues of the *Seed Journal* leading up to the next session. In my estimation, this project is as important as the construction of the Jack Dalrymple Greenhouse Complex...maybe more. Variety development and plant pathology programs, related to cereals and potato especially, are squarely in our wheelhouse and critical to our agency and the seed industry. Our support is a given, and I'll personally commit time and effort to our on-campus and industry partners in helping make this project a reality.

Best wishes for a successful planting season,

Ken Butich

Seed Conditioner's Manual Now Online

The North Dakota Approved Seed Conditioner's Manual has been updated and is now available online. The manual contains useful information for seed conditioners already approved to clean certified seed, or anyone interested in becoming an approved conditioner.

The manual includes new sections about our online access to seed samples and test results, as well as information on printing bulk certificates online. We've included hyperlinks wherever we could to make information like seed laws, labeling requirements and seed certification standards easier to access and to link directly to fillable forms such as Seed Sampler's Reports.

To access the manual, go to the *Field Seed* section of our website and click on *Approved Handling Facilities*. Select *Seed Conditioners*, then click on *Approved Seed Conditioner's Manual* at the bottom of the page to expand the box to show the different sections. Each heading is a link to a pdf file and users can print individual pages or sections of interest. We hope you will find our online version useful and easy to navigate.

Seed Department Welcomes New Staff

Jannat Yasmin joined the department as a seed analyst in January. She will work primarily on germination testing. She earned her Ph.D. in Bio Resources Process & Environmental Control Engineering. Her primary work will be in the Seed Lab, but will also assist in field inspections this summer.

Todd Lutz joined the department as a field, facility and regulatory inspector. Todd lives in New England, ND and will work the western part of the state, replacing Wes Pepple.

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Please remove ammunition from your seed samples before sending to us. Thanks!



We Have Our Limits

Steve Sebesta, Deputy Commissioner

Epiphany

[ih-pif-uh-nee]

Noun: a sudden, intuitive perception of, or insight into the reality or essential meaning of something, usually initiated by some simple, homely, or commonplace occurrence or experience. (Dictionary.com)

We've all had one. That sudden feeling you get when you finally realize you should have done something differently or you finally grasp the consequences for having done what you did. You know - that Homer Simpson moment - "Doh!"

There are occasions during the course of the year when Seed Department managers get phone calls from seed growers who had an **epiphany** about their seed production, the reality of their inventory, or a lost opportunity. These conversations generally start with an admission by the grower that they planted eligible seed on eligible ground but they didn't apply for field inspection on the entire field because they either (a) didn't envision having sales for all those bushels, or (b) just didn't want to spend a little more

money to have the entire field inspected. That admission is usually followed by a question such as "what can we do about that?" The answer is easy, but blunt – nothing. We have rules, seed certification begins with a field inspection. Moreover, it's a Federal Seed Act requirement! We try to provide reasonable solutions when issues arise, but always within the scope of our rules to ensure a level playing field across the industry. We have our limits.

The process of certifying seed actually begins when a seed grower purchases eligible seedstock with the intent of producing seed for sale. Our involvement begins when the seed grower applies for field inspection and ends when final certification of the seed lot is completed and the labeler receives legal labels (bulk certificates or tags). In between, a lot of things happen to ensure the varietal identity and genetic purity of that seed meets appropriate standards for the crop and class of seed. The process has served the U.S. seed industry well for more than a century and we take our role in the process seriously to ensure we deliver quality services to our customers while upholding the rules and standards for seed certification.

Reducing unnecessary input costs is important to the bottom line, but when one carefully examines and understands the cost of certification, it's hard to see the logic of not applying for field inspection when an eligible crop is planted on eligible land.

Using NASS stats for average yields in 2020 on a quartersection of land and current costs for field inspection, lab testing and final certification, one should easily recognize the true cost of certification is very economical. The state-wide mean yield for spring wheat in 2020 was 49 bu/ac. Total costs for certifying 160 acres of production totals \$1,008.80 so certification costs only **13 CENTS per bushel**. According to my sources, the mean price of certified spring wheat seed in early March was \$13.50 per bushel, making the value of Certified class seed from that quarter-section \$105,840. Which begs the question – **Why would anyone sacrifice \$105,000 just to save \$400?**

	Cost of Producing Certified Seed Assuming Average Yields for a 160 ac Field								
	Field Inspection Cost ¹	Required Lab Tests	Final Certification Fee ²	Lot Fee	Total	Cost per Bushel	Mean Price for Certified Seed	% of total Seed Cost	
Spring Wheat	\$400	\$50.00	\$548.80	\$10.00	\$1,008.80	\$0.13	\$13.50	0.95%	
Durum	\$400	\$50.00	\$436.80	\$10.00	\$896.80	\$0.14	\$23.00	0.62%	
Barley	\$400	\$120.00	\$705.60	\$10.00	\$1,235.60	\$0.12	\$12.00	1.02%	
Field Peas	\$400	\$58.00	\$448.00	\$10.00	\$916.00	\$0.14	\$22.00	0.65%	
Flax	\$400	\$50.00	\$235.20	\$10.00	\$695.20	\$0.21	\$45.00	0.46%	
Soybeans GT	\$400	\$58.00	\$380.80	\$10.00	\$848.80	\$0.16	\$45.00	0.35%	

¹\$2.50 per acre

² \$.0.07 per certified bushel

Reminders for Approved Facilities

Kyle Bednar, Field Seed Inspector II

The 2022 approved facility inspection process wrapped up in late December, however, several new facilities came on board in the past couple months. Here are a couple things to keep in mind prior to the upcoming seed season.

Bulk certificates must be issued to the buyer with each transaction. The Seed Department launched an online program for growers/retailers which includes bulk certificate printing. This system records each transaction and deducts the bushels you sell from the total number of bushels in the lot. It also creates the sales log sheet, eliminating the need to complete one by hand. Paper bulk certificates are still available for those who don't want to print online. I encourage you contact the Seed Department office if you are interested in getting set up for this online service. **Samples and records** must be retained after final disposition of the seed lot. A two-pound sample of each seed lot labeled with kind, lot, class, and variety must be retained for one year. A copy of the corresponding bulk certificate works best. Records of each seed lot handled must be retained for three years.

Like everyone else, we look forward to getting back in the fields this summer.

Joe's Timely Tips continued from page 1

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Review the Field Inspection Report It is the grower's responsibility to ensure each seed field has been inspected and has passed before harvest. Do not harvest a field if you are unsure. Call your inspector or the Seed Department to confirm the status. Review the field inspection report for any corrections or problem areas to avoid during harvest.

Ascochyta Testing

Presley Mosher, Diagnostic Lab Manager

We are seeing an increase in the number of requests for *Ascochyta* screenings in pulse crops (chickpea, lentil, and field pea). Ascochyta blight is a serious disease of pulse crops that can result in yield loss. The pathogens that cause Ascochyta blight are host specific, meaning the pathogen primarily causes disease on one host, but not other pulse crops. *Ascochyta rabiei*, for example, causes disease on chickpea, but not lentil or field pea. Infected seed is an important source of inoculum that may cause disease in the field. Seed health testing is important to determine the presence and inoculum levels in seed lots.

The NDSSD Diagnostic Lab screens for the presence of fungal species that cause Ascochyta blight by culturing on agar plates. After an incubation period, plates are examined for fungal colonies that are morphologically consistent with the various Ascochyta blight pathogens. Results are given as percent incidence. The test can normally be completed in 8-10 days.

An Ascochyta test is required for certification of chickpeas and lentils and the test result must be on the label for each seed lot. Acceptable incidence levels of Ascochyta blight and control options vary by host crop:

- Chickpea: 0.3% or greater is considered high. An alternate seed source is `advised if levels this high are reported. Control options include planting disease-free seed, resistant cultivars and crop rotation to non-host crops.
- Lentil: 1% or greater is considered high. Crop rotation, fungicide application, and resistant varieties are control options.
- Field pea: 5.0% or greater is considered high. Control options include planting disease-free seed and including non-host crops in rotations.



Ascochyta infected field pea seeds next to unaffected seeds.

500 seeds are plated per sample and results are reported as percent incidence.

Please visit the Diagnostic Lab page at seed.nd.gov for more information on Ascochyta and other seed health tests!

Potato Virus Y Strains

Kent Sather, Director, Potato Programs

The major cause for rejection of seed potato lots in North Dakota and other states in the past 20 years is Potato Virus Y (PVY). This virus can cause yield loss and tuber quality issues. Control is difficult due in part to how easily it spreads from field to field by aphids and the mild symptom expression of recombinant strains, making infected plants difficult to rogue.

Significant research was needed after new PVY strains were introduced to North America nearly two decades ago. What strains are where? How quickly will they spread? What impact will they have on plant growth, yield and quality? What diagnostic tools are needed? USDA research grants through Specialty Crop Research Initiative (SCRI) helped fund nationwide collaboration to study this problem. Certification agencies and scientists have been working together to expand knowledge on the topic.

Surveys done several years ago identified PVY strains present on North Dakota seed lots as PVY^o, PVY^{N:O}, PVY^{NWi}, and PVY^{NTN}. These strains also exist in other regions of North America. O is considered the original or common strain, existing in potato populations for many years. Plants infected with the O strain often show very good visual symptoms, significantly reduced yield, but no tuber necrosis. The N strains, or necrotic strains, are newer to our potato production, introduced through seed from other countries and states. These strains produce mild symptoms on vines with less yield loss, but can cause tuber necrosis in some varieties.

More recent surveys in other parts of the country indicate a change in strain prevalence over the years. In the Pacific Northwest, for example, the PVY^o strain is almost extinct. The PVY^{NWi} and PVY^{NTN} are dominant, with the PVY^{NWi} being the most prevalent. This likely is the trend in North Dakota as well.

PVY will never be eliminated from potato production. Training inspectors for visual identification of PVY in plants and tubers is important. Testing is important. Certified seed programs have, and will continue to suppress PVY levels in certified seed by maintaining tolerances in inspection standards. Certification rules and regulations will adjust as needed to focus on the quality of seed production as new research is presented.



Yukon Gold NTN, tuber necrotic ringspot.



Healthy Ranger Russett (right). PVY^{NWi} on left.

Pictures are downloaded from, and more PVY information can be found at https://blogs.cornell.edu/potatovirus/pvy/

References:

Karasev, A.V. 2022. PVY strain composition in PNW potato, 2011-2021. WERA-89 Mtg 3/15/22. Whitworth et al. 2021. Potato virus Y necrotic tuber symptoms in varieties from different market classes. WERA-89 Mtg 3/15/22.

Normal vs. Abnormal Seedlings

Jeanna Mueller, Seed Lab Manager

According to AOSA Rules for Testing Seeds, germination is defined as the emergence and development from the seed embryo of those essential structures that, for the kind of seed in question, are indicative of the ability to produce a normal plant under favorable conditions.

When I speak with growers about test results, there is often confusion about the difference between "normal" and "abnormal" seedlings. Will it become normal? Is it just slow?" According to the rules, "a normal seedling possesses the essential structures that are indicative of their ability to produce plants under favorable conditions." In a germ test, seedlings are grown for the prescribed period stated in the rules. At the end of that time we analyze the sample. If we think a seedling needs more time to germinate we can extend the test period another 2 days. Another comment that concerns me is "If it sprouts, it's good, right?" There is a barley sprout test conducted by malting companies to determine grain quality for malting, but that is a very short test and doesn't come close to a good comparison to an official germination test. Don't compare the results.

Abnormal seedlings are defined as "all seedlings that cannot be classified as normal seedlings." The most common problems are missing shoots or roots, thickened hypocotyl or roots. Abnormal seedlings may result from mechanical damage, chemical damage, and vigor issues.

Hard seeds are "seeds that remain hard at the end of the prescribed test period because they have not absorbed water due to an impermeable seed coat." Many species may have hard seed but the most common field crops are from the Legume family, such as alfalfa, clovers, field pea, and lentils. The figure shows an example of normal and abnormal seedlings and hard seed.

Our seed lab is an AOSA accredited lab, which means we follow AOSA Rules for Testing Seeds. This rulebook has specific guidelines for testing all types of crops. The guidelines were established by seed labs around the country through a scientific process to create uniformity and quality in seed testing. To maintain accreditation, we must conform to AOSA rules and audit processes.



Normal pinto seedling far left. Abnormal seedlings on upper right. Hard seeds on bottom row.

As always, do not hesitate to call and ask questions. Have a wonderful planting season!

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Labeling Seed Mixtures and Blends

Jason Goltz, Seed Regulatory Manager

Cover crops have grown in popularity over the last several years for a variety of reasons. Whether planted for erosion control, grazing or habitat, it must all be labeled so it is important to understand what must be on a label.

Each component will be listed by kind and variety in descending order of proportion. The component with the highest percentage is listed first, followed the next highest and so on. The term 'Variety Not Stated' must be used for crop kinds which do not require the use of a variety name.

The germination percentage and date are listed for each component, but the purity analysis is listed for the overall mix. The percentages of pure seed for each component and the overall percentages of weed seeds, other crop seeds and inert matter must all equal 100%.

Each variety that is protected under the Plant Variety Protection Act must be labeled by identifying it as a protected variety. The component variety name will be identified with an asterisk (e.g., ND Genesis*). The PVP statement (*Unauthorized Propagation Prohibited – U.S. Protected Variety) should be somewhere on the label. The origin for each component must be included, as well as the term 'mixture' or 'blend'. There is a difference. A mixture consists of more than one kind and a blend consists of the same kinds but different varieties. Lastly, the name and address of the labeler must be clearly printed on the label. Any additional information may be included as long as it is truthful.

The records for the mixture must include those for each component. In the event of a problem with the mixture, each component must be traceable to its origin by records. Bulk certificates or certified tags must be retained for certified seed components.

When retesting a seed mixture, a copy of the tag must be included with the lab test request form. The seed lab will have to separate the sample into its primary components. Because sampling mixtures can be challenging, including the tag will allow the lab to determine if all the components are present in the sample. Expect additional fees for the lab to separate out the individual components.

Seed mixtures are commonly used for cover crops. Grass seed also is frequently mixed. These types of seed mixtures can result in very extensive and detailed tags. Please call if you have any questions on the labeling requirements for seed mixtures or blends.

North Dakota State Seed Department

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NDSSD Calendar

May 1	Applications due for grass inspection
May 30	Memorial Day, office closed
June 1	Applications due for hemp
June 15	Applications due for all crops including potato (except buckwheat, millet & soybean requiring a single inspection)
July 4	Office closed for Independence Day
July 15	Applications due for buckwheat and millet
Aug 1	Applications due for soybean requiring one inspection
Sept 1	Reports due: Annual Report of Agricultural & Vegetable Seed Sold (labeling fees), Research Fees; Carryover Seed; Applications for Approved Conditioner & Bulk Retail Facilities
Sept 5	Office closed for Labor Day