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Newsletter of the North Dakota State Seed Department

Inside

- 1 Moving Forward When Opportunities Arise
- 2 From the Commissioner's Desk
- 2 Useful Tips
- 3 Certified Purity Analysis
- 3 Learning from Other's Mistakes
- 4 A New Face in the Potato Program
- 4 Communication is Critical for Success
- 5 Potato Seedstock Production
- 5 NDCISA Raises Royalties
- 5 Staff Changes
- 6 Calendar



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Moving Forward When Opportunities Arise

Steve Sebesta, Deputy Commissioner

If you had the opportunity to reduce your inputs, lower your costs, improve operating efficiency and improve the quality of your outputs, what decision would you make? Those opportunities are exactly what the Seed Department examined when we made the decision almost two years ago to migrate all of our variety ID testing to a different technology.

The purpose of certification is to ensure varietal identity and genetic purity. Results of research we conducted more than a decade ago led us to adding genetic testing for varietal identity as an important component to the certification process. In 2010, we went all in and implemented testing in three crops that together, represented the majority of seed production acres in our program. Since then, we've tested every seed lot of spring wheat, barley and field peas submitted for final certification, roughly 1,500 seed lots per year.

In 2021, the Seed Department contracted with the National Agricultural Genotyping Center (NAGC) in Fargo to provide variety identity testing services. This is exactly the type of work they do, and they do it very well. They picked up where we left off, running the same tests that the Seed Department had done successfully for the last 12 years – protein electrophoresis for wheat and polymerase chain reaction (PCR) for barley and field peas. Electrophoresis has been the standard test for wheat for decades but as additional varieties are introduced, seed storage proteins diminish in discriminatory power. Diagnostic laboratories, like NAGC, have begun replacing protein-based tests with DNA markers. Consequently, they proposed converting our testing protocols to capillary electrophoresis (CE).

Over the course of the last 18 months, the NAGC has been developing and perfecting the methods for variety ID testing using CE. This was a two-step process. The first step was converting the spring wheat test to a DNA genotyping panel and identifying appropriate single sequence repeats (SSR markers) with the best discriminatory power. The second step was incorporating an automated capillary electrophoresis system for genotyping analysis to improve the testing efficiency. In January 2023, I delivered two sets of samples for blind testing to evaluate the discriminatory ability of CE testing for wheat. Samples consisted of pure seed and mixtures ranging from 1% to 10% varietal contaminants. In all cases they were able to identify the varieties or the major component in the mixes. Based on these results, we went live with CE testing for wheat February 20 and have tested more than 220 samples so far with no problems. As I write, the NAGC is currently testing blind samples of barley and we look forward to converting barley to CE testing yet this spring. Field peas will follow.

There are numerous advantages to using CE compared to protein electrophoresis and PCR. This is a DNA test, so it is more accurate. DNA marker analysis paired with a CE system eliminates the multi-day workflow of loading, running, imaging, and interpreting gels. CE systems can detect multiple targets within a single test sample, allowing multiple SSR markers to be genotyped simultaneously. As a result, less consumables and reagents are used per sample, reducing the cost and increasing the efficiency of variety ID testing. The SSR genotyping and CE platform can be used in other crops to expand the availability of genetic analysis for breeding and seed certification processes.

From the Commissioner's Desk

I have yet, in all these years, to miss an opportunity to discuss legislative issues during a session. May as well remain consistent.

For the first time in my tenure, the Seed Department filed an agency bill with the legislature on advice of counsel. SB2062 contains an amendment to seed laws that addresses language that is termed "ambiguous" by our attorney, and seen as a loophole by the Seed Commissioner. The current enforcement provision of code reads:

4.1-53-57. Penalty - Criminal - Civil - Exemption.

(3) Any person found guilty of violating this chapter or the rules implementing this chapter is subject to a civil penalty in an amount not to exceed ten thousand dollars for each violation. The civil penalty may be imposed by a court in a civil proceeding or by the seed commissioner.

There are two critical and problematic pieces to this provision. First, the last sentence allows an individual to bypass the regulatory authority and proceed directly to court with claims involving seed laws. Second, while North Dakota has the highest maximum penalty provision in the U.S. for violations of seed law, it turns out that violations may not (as they should be) always be evaluated and assessed by the regulatory agency (NDSSD).

SB 2062 amends the paragraph to read: The civil penalty may be imposed by a court in a civil-proceeding or by the seed commissioner. The seed commissioner may make application to the district court to compel payment of civil penalties imposed under this section.

The amendment corrects the first problem; seed law should direct seed-related matters to the regulatory authority first, for purpose of review and enforcement when (and if) warranted. The amendment doesn't prohibit or inhibit civil proceedings, it only clarifies that the Commissioner's office has the first look at

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

complaints. It's my view that an administrative agency, the one responsible for writing the rules that implement law, should be first in line to make determination on those rules. A decent analogy is game and fish laws, where a review of offence and penalties is likely best done by ND Game & Fish rather than a court. They are the experts in the field and have promulgated rules that assess penalties consistently and based on the severity of wrongdoing.

The second piece, the penalty provision, is equally important and tied directly to the first. The Seed Department asked the legislature in 2017 to increase the maximum penalty to \$10,000 specifically to address violations involving Plant Variety Protection (PVP). Our rationale then, as now, was to help variety owners protect their intellectual property rights, thereby promoting investment in varietal development. The Department commonly assesses fines in the range of \$250-\$1,500 for other seed law violations including labeling issues. The maximum penalty is intentionally levied only in cases of PVP violation.

The amendments to our seed law penalty language may not have been necessary except for multiple lawsuits that have been threatened over the past two years. The suits claimed damages for mislabeling of variety name, which on the surface is reasonable. The unreasonable part: review by the state's seed regulatory agency was bypassed, and our state's maximum penalty provision was used to calculate damages. Under current law, both were legal tactics. In my view both are absolutely wrong; hence the use of the term "loophole".

This amendment may appear pro-industry on the surface, but it's not. It's intended to clarify how seed regulatory matters should be handled in North Dakota. First, by not bypassing the regulatory authority and second, and most importantly, not misusing the intent of the seed law in enforcing and assessing penalties.

Best wishes for a safe planting season,

Ken Butich

Useful Tips

- Provide enough seed for all the tests requested.
- USPS will only deliver to our PO Box, all other couriers use the street address.
- When emailing, use the central email account:
 - ndseed@ndseed.ndsu.edu.

Multiple staff members check that account regularly. If you email an individual directly and they are not in the office, there may be a delay.

Certified Purity Analysis

Jeanna Mueller, Seed Lab Manager

We occasionally receive questions about how a purity analysis is done. As a member of the Association of Official Seed Analysts (AOSA), we follow the AOSA Rules for Testing Seeds. Most of the time our certified samples are submitted by the seed conditioner after the seed has been cleaned. All the information including variety name, field inspection number, lot number etc., are entered in our database. The certified sample then receives a lab sample number that follows the sample in our database for tracking purposes. If the sample requires a germination test also, it is started first. Since the germination period is 7 to 10 days for most crops, our goal is to have the purity analysis results finalized on the same day as the final germination day.

Our purity analyst will completely mix the sample in a Boerner seed divider. Once mixed, it will be divided into purity and noxious working weights. The purity analyst then examines each portion, seed by seed. The following table shows the different portions of a purity test and what we look for in a 500 gram certified wheat sample.

Total 500-gram Sample				
100-gram Purity Portion	400-gram Noxious Weed Portion			
Pure Seed Portion - Seed Count removed	Other Crops			
Inert Matter	Common Weeds			
Other Crops	ND Noxious Weeds			
Common and ND Noxious Weeds				

Pure Seed Portion - Kind or cultivar considered pure seed, reported as % by weight. The Seed Count is removed from this portion. We send whole seeds through the seed counter, resulting in seeds/pound.

Inert Matter - Any non-seed material or broken seed units that are one-half or less than original size. This includes seed and seed-like structures from both crop and weed plants, reported as a % by weight.

Other Crop Seed - Other seed found that are considered to be crop seed, reported as #/lb.

Weed Seed Portion - The purpose is to detect the presence of common weeds in a sample and report the rate of occurrence (#/lb.).

ND noxious - The purpose is to detect the presence of North Dakota noxious weeds in a sample and report the rate of occurrence (#/lb.)

If any of the factors exceed the tolerances according to the certification standards the seed lot will fail. We welcome questions by phone or by visiting our lab in person for a more detailed explanation.

Learning from Other's Mistakes

Dustin Smith, Regulatory Program Manager

Over the past few years, the Regulatory Program has been understaffed, and because of that, we haven't been able to visit many seed facilities. Thankfully, we're starting to see a return to normal. With an increased effort in bringing in qualified regulatory inspectors, we are planning to be fully staffed this summer, and we're looking forward to having a better presence for onsite inspections.

Despite being shorthanded, we were able to successfully resolve a couple of serious infractions which should serve as a good reminder of the importance of following proper certification procedures and labeling laws. It started last summer when a seed grower submitted an application for field inspection without the required label to verify seed eligibility. He indicated he did not receive a label from the retailer. When contacted, the retailer said they purchased the seed from a seed grower but did not receive a bulk certificate when the seed was delivered. Instead of delaying the sale until the seed was relabeled appropriately, the retailer, not wanting to lose a sale, resold the seed to another grower. Our investigation determined that the original seed producer sold the seed to the retailer <u>before</u> a seed sample had even been submitted for lab testing. To make things worse, the seed lot failed the purity exam due to contamination from other crop seed.

In this case, the initial seed grower and the retailer were each fined \$13,000 for violations including PVP laws and labeling requirements. Additionally, the grower who purchased the Registered seed in good faith to produce Certified seed, unfortunately planted ineligible seed. Instead of the high value certified seed crop the grower had budgeted for, his crop is likely feed. Several poor decisions were made. Had the original seed grower submitted a sample earlier, he would have known the seed lot would fail final certification. Had the bulk retailer reached out to us sooner about not receiving a bulk certificate required for relabeling before reselling the seed to one of his customers, we could have intervened earlier and prevented one illegal sale. It is important for everyone to understand seed laws. A phone call is always encouraged if there are doubts about the status or quality of a seed lot.

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A New Face in the Potato Program

Adam Winchester, Potato Program Director

Hello, I am Adam Winchester, the new Director of Potato Programs at the North Dakota State Seed Department. My time with the State Seed Department started in February, and for the next three months will be working as a "co-manager" with Kent Sather who will leaving this June. I am thankful for all of his help and support.

Let me begin by introducing myself. I grew up in southeastern Idaho. Our family rogued potatoes and picked leaves for the Idaho Crop Improvement Association. I graduated from Brigham Young University in 2013 and completed a Master's Degree in Plant Science from North Dakota State University in 2015. From there, I worked at SunRain Potato Varieties as a potato breeding technician for three years. In 2018 I took a job as the Program Manager for the Potato Certification Association of Nebraska. I left Nebraska in February 2023 to come to North Dakota to be the new Potato Program Director.

Our post-harvest test did not turn out as planned this year. The plot in Homestead, Florida was lost due to flooding, so certification status reverted to summer readings and lab tests for all lots to be recertified in the state of North Dakota. 74-04-01-09 of our Seed Potato Standards states "In the event of frost or other serious malfunctions of the post-harvest grow-out test, eligibility of a seed lot will be based on the current field readings or a laboratory test at the discretion of the state seed department." Lots destined for other states were subject to the importing state's testing requirements, i.e., Potato Virus Y (PVY) or PVY + Potato Leaf Roll Virus (PLRV). Since it was not possible to perform a vine ELISA test (testing of the leaves), testing of the sprouts was utilized instead. This is a common method of testing employed by certification programs all across the United States.



Approximately 70 lots were sprout-tested for PVY alone and 60 lots were tested for both PVY and PLRV. Potato Virus Y was detected in 23% (16/70) of lots tested, an increase of 10% from 2021.

My first course of action as the new director will be to meet as many of you as possible, and as soon as possible. The State Seed Department will be losing some very talented personnel in the coming months, so expect to see me at your farm conducting shipping point inspections.

Communication is Critical for Success

Jason Goltz, Seed Certification Manager

Summertime is a busy season for seed producers as well as field inspectors. Inspection is required for all crops intended for certification and that must be done at the right stage of crop development. In order to ensure fields are inspected in a timely manner, it is very important to communicate with your field inspector as crop development progresses.

Isolations must be in place and weeds controlled. Some crops, like small grains, may be inspected right up until they are ready for harvest. Others, like flax and field peas, must be inspected while they are in bloom. Inspections must be done before harvest, but remember, a swathed field is considered harvested and will result in disqualification. Specific requirements for each crop are listed in the crop standards, which can be found on our website, www.seed.nd.gov.

Field inspectors are provided with the grower's contact information and they should reach out for an initial introduction. Likewise, growers will receive a letter informing them of their inspector's name and contact information. That letter will list all the fields for which we have received an application. Check that list carefully to make sure we have all your fields.

Fields are divided somewhat equally among our inspectors and as a result, some inspectors may cover larger areas than others. Do not assume the field inspector is working in your county exclusively. As harvest nears, make sure you let the field inspector know your harvest plans. If you wait until the day you want to harvest before calling an inspector, they could be hours away and unable to respond immediately. Plan ahead.

In some cases, a grower may forget to apply for a field inspection. It is best not to wait until the June 15th deadline to apply. Complete and submit the application as soon as the seed is in the ground. A field inspection application can always be cancelled by an applicant before the inspector sets foot in the field. If that happens, the applicant will receive a refund minus a twentydollar fee. After the application deadline, we will accept applications until harvest but late fees will apply.

It is the grower's responsibility to ensure the field has been inspected, so talk to your field inspector rather than assume the field has been inspected. Not all areas in the state have reliable cell service, so do not hesitate to contact the office if you cannot reach your inspector. After the field has been inspected, you will receive notification of the result. During field inspection season, communication is key.

Potato Seedstock Production

Presley Mosher, Diagnostic Lab Manager

This winter may seemingly never end, but things are greening up at the Fargo office. The NDSSD Potato Seedstocks group recently planted this year's spring minituber crop. This crop is primarily made up of russet varieties. Over 50,000 delicate tissue culture plantlets are hand planted by our dedicated crew (Dylan Seaver, Brianna Tufte, April Dietz, and Brittney Vickerman). Propagation of these plantlets starts months in advance with a series of tissue culture multiplication cuts to obtain the required number.

Minitubers are the initial generation used in certified seed potato production systems. They start from disease-free tissue culture and each greenhouse crop is tested for disease at 30 and 60 days. The Diagnostic Lab tests 1% of all plants for 3 viruses for the 30-day test and 8 viruses for the 60-day test using a serological technique known as ELISA. Monitoring for the presence of disease and insect pests is an essential preventative measure in the greenhouse.

Throughout the growing season, water and fertilizer are carefully applied to match the needs of the plants. Over the years, our crew has gained expertise in the unique needs of



each variety, both in tissue culture and the greenhouse. Each crop is allowed to grow for up to 90 days until they are ready to harvest. After harvest, the entire greenhouse is sanitized and beds are prepared with new growing media for the next crop which is planted in July and consists mostly of red and chipping varieties.

After harvest, this year's seed will be kept in cold storage until delivery for the 2024 crop. This fall, we'll take orders for seed that will be field planted in 2025. If you have any questions about the Seedstocks Program, please contact Presley Mosher at pmosher@ndseed.ndsu. edu or 701-231-5430.

NDCISA Raises Royalties

The ND Crop Improvement and Seed Association has increased royalties on several NDSU varieties for which they have licensing rights. This increase will be effective July 1, 2023 so initial labelers will be assessed royalties at these new rates for seed sold after that date.

Variety	Fee/bu sold	New NDSU Releases	Fee/bu sold
ND Grano durum	\$1.35	ND Treasure barley	\$1.00
ND Riveland durum	\$1.35	ND Stanley durum	\$1.35
ND Dawn field pea	\$1.75	ND Carson oat	\$1.00
ND Hammond flax	\$1.75	ND Spilde oat	\$1.00
ND Frohberg wheat	\$1.00	ND Heron wheat	\$1.40

Staff Changes

Adam Winchester joined the Seed Department in February as Director of the Potato Program. See Adam's article for more.

Dustin Smith joined the Seed Department in February as Seed Regulatory Manager, filling the position previously held by Jason Goltz. Dustin is a graduate of the University of Minnesota – Crookston and has seed industry experience with several different seed companies in North Dakota and Minnesota.

Ciara Clark joined the Seed Department as a Field Seed Specialist April 3. If the name is familiar, Ciara worked in our Seed Lab as a Certified Seed Analyst for nine years until 2018, so she has seed testing and field inspection experience. Ciara will have dual responsibilities, working with the Field Seed Program doing field and facility inspections and with the Regulatory Program conducting retail facility audits and collecting samples for truth in labeling tests. Welcome back Ciara.

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NDSSD Calendar

- May 1.....Applications due for grass inspection
- May 29.....Memorial Day, office closed
- June 1Applications due for hemp
- June 15.....Applications due for all crops including potato (except buckwheat, millet & soybean requiring a single inspection)
- July 4Independence Day, office closed
- July 15Applications 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 4.....Labor Day, office closed