



# The North Dakota Seed Journal

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Newsletter of the North Dakota State Seed Department

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## IP Rights - Investing in Progress

Steve Sebesta, Deputy Commissioner

North Dakota farmers are fortunate to be able to grow so many different crops, which is partly the reason the State Seed Department usually leads the nation in the number of acres of seed production in certification/quality assurance programs each year. I believe there are two other significant reasons for this. First, farmers understand the value of planting high quality seed – it's an investment. Secondly, genetic providers, both public and private, have the legal ability to effectively protect their intellectual property, and in turn, reinvest in research programs to develop varieties that are adapted to this region.

In the September 2017 issue of the *Seed Journal*, I illustrated the connection between intellectual property rights (IPR) and innovation in agriculture. In that article, I showed that the number of protected varieties of four major crops in certified seed production in North Dakota had increased nearly three-fold from 1995 to 2016. Since most corn hybrids and soybean varieties planted today contain biotech traits that are protected by a combination of PVP laws and utility patents, I want to focus this article on the most widely-used type of protection to demonstrate the impact on agriculture, and specifically to wheat, the third most widely grown crop in the U.S. and a very important crop in our state.

North Dakota ranks first nationally in production of spring wheat and durum, with more than half the U.S. production. In 2018, North Dakota ranked second nationally in the production of all wheat. Given the importance of agriculture to North Dakota's economy, it is extremely important to understand how intellectual property rights laws have shaped production agriculture, and why IPR laws are important to our industry.

The Plant Variety Protection Act was enacted in 1970 to stimulate investment in R&D in self-pollinated crops by providing patent-like protection for developers. In addition to defining the scope of protection for developers, the original act contained some important exceptions, one of which was the farmer saved seed exemption that allowed farmers to save seed of protected varieties and sell it to

other producers. The act was amended in 1994 and perhaps the most significant change was the elimination of the exemption allowing farmer-to-farmer sales of seed. In my opinion, this change had a tremendous effect on the seed industry. Here's how.

The first PVP application for a wheat variety was filed with the USDA Plant Variety Protection Office in 1971. There were 8 applications that year and for the next 23 years there were an average of 14 wheat applications filed per year, with a high of 24 in 1985. Once the 1994 amendments were enacted, the number of filings began to increase significantly, and as the graph shows, the number of wheat PVP applications averaged 39 per year from 1995 to 2015, with a peak of 76 new varieties in 2014. Most interesting though, is the sharp upward trend in applications since 1994.



The Seed Innovation and Protection Alliance (SIPA) was formed as an industry-wide effort to champion the importance of intellectual property (IP) protection and its value to agriculture. SIPA supports the use of education as an instrument to protect innovation as well as to facilitate and promote the respect of intellectual property rights. SIPA will work with member companies to help them resolve IPR compliance allegations. Concerned about potential seed piracy? Call 1-844-733-3847 to anonymously report suspected seed IP violations.

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# From the Commissioner's Desk

I had the good fortune this summer of being invited to the Canadian Seed Growers Association annual meeting. Great people; fascinating discussions surrounding a major project called Seed Synergy that focuses on re-inventing their entire seed system. Similar and different, organizationally and operationally to what we do in North Dakota...on a larger, national scale. Having grown up 40 miles from the border...I can speak Canadian, and have always enjoyed time spent with neighbors from the north.

Both Steve Sebesta and I have been fortunate to work closely over the years with our regional, national and international AOSCA (Association of Official Seed Certifying Agencies) counterparts. The U.S.-based colleagues are the designated authorities and official seed certifying agencies in their respective states. AOSCA acts as the national association for these state organizations, and serves an important role in verifying that members comply with FSA requirements, among other responsibilities to the members and seed industry. Each member state has its own unique set of responsibilities, services, authorities and partnerships.

The North Dakota State Seed Department is unique by comparison to nearly every other AOSCA agency. All of us inspect and final-certify crop seeds grown in our state; most perform seed quality testing in a laboratory at their facility. A few are state agencies, and also carry the responsibility for seed regulatory activities. A smaller number also inspect potato seed. We do all of these things, and more.

The Seed Department is a signatory to a cooperative agreement with USDA/AMS to provide Federal-State shipping point inspections and audit programs to the potato industry. In plain English: physical quality inspections of potato tubers, and GHP(Good Handling Practice)/GAP(Good Agricultural Practice) auditing services meant to limit the risk of food-borne pathogens in fresh produce.

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  
Jeff Prischmann.....Diagnostic Laboratory Manager  
Starr Thies .....Business Manager  
Mike Oosterwijk.....Potato Program Supervisor

The Seed Department also operates a potato seedstock program. Our staff produces potato plantlets from tissue culture in a sterile lab. Those plantlets, representing dozens of different potato varieties and clones of true varieties, are transplanted in our greenhouse, harvested, stored and delivered to low-generation seed producers in ND and Minnesota. This first (pre-nuclear) generation seed is produced in our lab and greenhouse under very strict quarantine and testing protocols, and represents the first of up to 6 additional field production cycles in the potato industry. We also serve as the official PVP repository for varieties released by the NDSU breeding program, and maintain those and other varieties/clones (numbering about 300 mother plants) in our seed bank.

I mentioned that most agencies have their own seed quality lab, as do we. These labs evaluate seed quality factors such as germination and purity, required for labeling, and also perform other specialized tests. We also have another lab enterprise in our agency; our seed diagnostics lab. Here, we perform a variety of tests for seed-borne pathogens and potato viruses. And that's just one side of the diagnostic lab. On the other side; seed trait tests (primarily herbicide tolerance) and variety identification testing: both of which have become high priorities in seed industry, and part of North Dakota's seed standards, over the past decade.

The one thing we don't do is operate a field crop Foundation Seed program. However, our Deputy Commissioner (the previously mentioned Sebesta) does serve in a dual role as the Director of the NDSU Foundation Seed program. Ah ha, another connected enterprise.

The point is this: these and other seed related activities are all performed by one entity in North Dakota. You might find field seed certification and testing done by a crop improvement association, potato certification done by a university program and seed regulatory activities performed by a state department of agriculture (or a combination of entities) in other states or by our Canadian neighbors.

I believe this structure lends itself to an efficient, coordinated and communicative business/agency. Since we are also closely aligned with statewide grower and agribusiness associations, commodity councils and university breeding programs, I also believe we do a good job of being connected and responsive to industry needs. Additionally, the State Seed Commission (our board of directors), is comprised by law of the previously mentioned groups.

The CSGA experience was a good reminder, and the AOSCA connection further solidifies the notion that our agency really is different...in a good way. Strangely, and somewhat unfortunately, many involved in agriculture in this state are unaware of who we are or what we do.

Best wishes for a safe and bountiful harvest season.



## Research Fee Reminders

Seed producers who grew ND Benson, ND Stutsman, ND17009GT and ND18008GT soybeans need to remember that the fees you collect must be on a 140,000 seed count unit not a bushel unit (60 lb). To convert from bushels to 140,000 seed count units use the following conversion:

$$\text{Units} = \frac{\text{bushels} \times 60\text{lbs} \times \text{seed}}{\text{bu} \quad \text{lb} \quad \text{unit}} \div 140,000 \text{ seed}$$

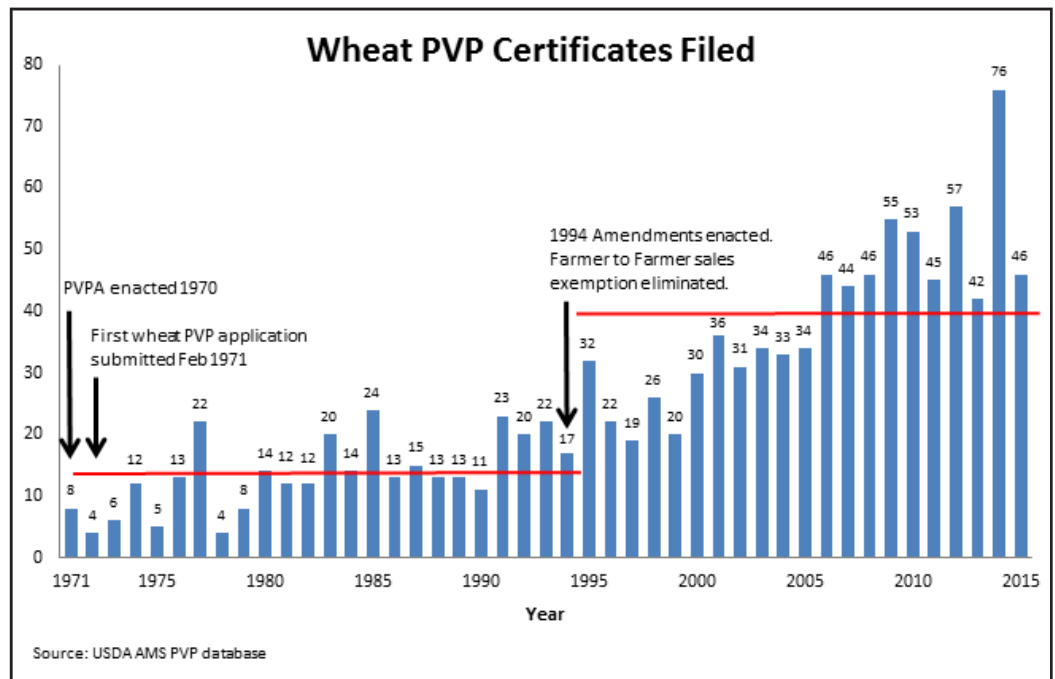
The following varieties are either new for 2018-19 sales or have a fee increase, and are collected on a bushel basis: ND Grano and ND Riveland durum - \$1.00; Hayden oat - \$0.30; Duclair HRSW - \$0.50; ND Eagle lentil - \$2.40; ND Vitpro HRSW has increased to \$ 0.75.

## IP Rights - Investing in Progress

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It is widely believed that once the farmer-to-farmer sales of saved seed were prohibited in 1994, public and private breeding programs began investing in the development of new varieties of self-pollinated crops such as wheat. In North Dakota this year, the Seed Department inspected 71 released varieties; 18 were protected by PVP; 45 were protected by PVP Title V, with applications expected for 5 additional varieties. Some of these varieties are also protected with utility patents. That's 96% of the total, so everyone should make the assumption that any variety they are growing is protected.

It is my opinion that IPR laws have made significant and positive impacts on agriculture today that have resulted in more new varieties that possess traits for improved performance resulting in greater productivity than we have ever attained at any other time in history. For these reasons, we, as an industry, should embrace and support IP rights. And, for these reasons, the ND State Seed Department enforces state and federal seed laws and IP laws – because they benefit agriculture.



## Variety ID Testing Required to Certify Wheat, Barley and Field Pea in ND

Jeff Prischmann, Diagnostic Lab Manager

Variety ID testing has been a certification requirement for spring wheat, field pea, and barley since 2010 in North Dakota. These tests provide numerous benefits to the seed producer and provide quality assurance for the variety owner as well as those who purchase certified seed of these crops. Problem samples can be detected early and before seed lots are sold and planted in the spring. The majority of samples test true for variety identity, but when a problem is found, the most likely reasons include incorrectly labeled bins/lots or mixtures of two or more varieties.

Barley and field pea samples submitted for final certification are tested utilizing DNA. This test uses polymerase chain reaction (PCR) in combination with specific primers to identify the variety and involves multiple steps including DNA extraction, PCR, and gel electrophoresis. This test is very specific depending upon the DNA markers used and is able to distinguish varieties from one another when control samples are used.

Spring wheat samples submitted for final certification are tested using protein and polyacrylamide gel electrophoresis (PAGE). Seed proteins differentiate spring wheat varieties from each other based on a specific banding pattern or fingerprint. Appropriate control samples are utilized when a sample is tested to verify that the samples match.

Due to the number of samples that are tested and the steps involved in these tests, wheat samples are generally completed in 2-3 days after receiving samples. DNA tests

for barley and field pea are generally completed in 5-7 days. Growers should keep these time frames in mind when submitting samples for testing. In general, these tests are completed about the same time a germination test is completed. Also keep in mind that labelers who submit pre-conditioned samples for germination to hasten labeling after conditioning may receive seed count and purity test results before the variety ID test is complete. That result will follow later.

Variety ID testing is also available as a service fee test to customers. The fees for these tests start at \$150 for wheat and \$250 for barley or field pea. Oat samples can also be tested using PAGE and the cost is \$150. Growers should submit at least a 100g sample for this test. Additional information regarding the sample may be submitted along with the sample. Please contact the department with any questions regarding variety identification testing.

## Seed for Resale

When seed is purchased for resale, mail, fax or email to [ndseed@ndseed.ndsu.edu](mailto:ndseed@ndseed.ndsu.edu) the bulk certificate(s) you receive for the lot(s) to the Seed Department and request new bulk certificates. You may commingle different lots of the same variety and class from multiple labelers in a bin and we'll adjust the analysis properly to reflect the commingled lot. The lot number must be changed on commingled seed and can be changed on any lot you have purchased to identify the new lot according to your naming scheme. It's a good practice to incorporate bin number and year into your lot numbers to help ensure the correct variety is sold to the customer.



## Is This Variety Protected?

*Jason Goltz, Regulatory Manager*

A common question we get at the State Seed Department is “Can you tell me if this variety is protected?” Since intellectual property protections have become the rule, rather than the exception, it would be more correct to ask how the variety is protected. Variety owners will protect their varieties using the following methods:

### **Plant Variety Protected (PVP)**

The owner of the variety has the exclusive right to control the production and marketing of their varieties. Seed of these varieties can only be sold with authorization from the owner. Producers who acquire seed of these varieties legally have the right to save seed for use on their own farm indefinitely, but cannot sell their production to others for planting purposes.

### **Plant Variety Protected Title V option**

If the variety owner elects the Title V option, seed of these varieties must be sold as a class of certified seed. Certification permits a person in possession of the variety to sell it as a seed product. There can be no common or “brown bag” seed sales of these varieties. Producers who acquire seed of these varieties legally have the right to save seed for use on their own farm indefinitely, but cannot sell their production to others for planting purposes.

### **Utility Patents**

A patent gives the patent holder the right to exclude others from making, using, offering to sell, selling, or importing into the United States the subject matter that is protected by the patent. The owner of the variety has the exclusive right to control the production and marketing of their varieties. Unlike PVP varieties, grain produced from legally acquired seed with a utility patent cannot be saved for planting on your own farm.

### **License Agreements**

Some variety owners require a limited use license agreement in order to purchase and plant their varieties. These agreements often prohibit saving grain for the purpose of replanting. Some owners call these CSO varieties (Certified Seed Only). Grain of these varieties may not be saved or cleaned for planting.

NDSSD only enforces PVP and PVP Title V; patents and licenses are enforced by the variety owner. When a caller asks how the variety is protected, we can only tell if it is protected through PVP and if it has the Title V option. A variety not protected by PVP may still be protected by another method.

Checking the *Seed Directory* is a good first step in researching the protections on a variety. It is not, however, the only source of information. Contacting the variety owner directly is the best way to answer questions regarding patents and licenses. Research varieties thoroughly to prevent inadvertent violations of intellectual property rights.

## Thies Joins Seed Department



Starr Thies joined the management team of the Seed Department this summer as Business Manager, replacing Kris Steussy. As the business manager, Starr is responsible for the financial management functions and daily operations of the Support Services staff

at the department. Starr most recently worked as Senior Accounting Specialist in the Department of Plant Sciences at North Dakota State University and brings accounting and office administration experience to the department. Starr is a native of New Brunswick, Canada and is fluent in English and French.

## Results May Vary

*Jeanna Mueller, Seed Lab Manager*

“Results may vary” is a phrase we see on many labels, commercials and sales ads. This is a warning to customers that their personal experience with a certain product may differ from that of another customer. Many products have “for best results”...on labels to help consumers achieve optimal results. Would it be fair to say as seed growers, buyers and sellers that the label should state “For best results...” on a germination test?

Occasionally we hear comments like “I had a germination test done at Lab X, and they got a higher reading.” From a lab analyst perspective, the higher result can be misleading and may not be accurate. My first reaction is; how was the test performed? The main factors in a reliable and repeatable germination test are length of time, proper media, and proper temperature. Other critical factors are the analyst’s training and expertise. One other factor that affects germination tests is the sampling process. The test is only as good as the sample.

At the ND State Seed Department seed lab, we follow AOSA Rules for Testing Seeds (as do all state seed testing entities). This rulebook has specific guidelines for testing seed of all types of crops. These guidelines were established by seed labs around the country as a way to create uniformity and quality in seed testing.

What type of germination test is performed? This may sound strange, but we hear varying terms that can be confused with a germination test. Some of these are “quick germ”, “sprout test” and “quick test”. In some cases, the end use of the seed justifies the type of test that will be the right fit for the customer. The terms listed above may be an adequate fit, as long as the results can be verified within the regulatory tolerance for labeling. In the case of certified seed, the germination test is required to be performed under AOSA rules. It is best to determine how the germination tests are conducted in different labs to clarify any differences observed in germination scores.

## Potato Program Update

*Kent Sather, Director, Potato Programs*

“Quality is good, but yield is a little low” seems to be the comment by dryland seed potato growers digging their 2018 potato crop in the Red River Valley. The volume of seed potatoes going into storage is expected to be down considerably from last year’s near record production. While early season rains were timely, moisture was lacking during crucial stages of tuber production. Growers were thankful for pre-harvest showers that softened soil for digging, and enhanced the quality of the product going into storage. Yields of seed potatoes under irrigation across North Dakota were average.

14,008 eligible acres were entered for certification for 2018, just 68 acres more than 2017. No acreage was rejected due to disease issues. Even so, PVY (mosaic) continues to be recorded in very low percentages in some seed lots that are 3 to 4 generations old. Summer inspection tolerance levels for PVY in North

Dakota as specified in Rules, Regulations and Tolerances is a maximum of 0.3% for Foundation seed and 1% for Certified seed. Be reminded that PVY is vectored by various aphid species. The Aphid Alert trapping network monitored by Dr. Ian MacRae (<http://aphidalert.blogspot.com/>) indicated, overall, fewer aphids than last year. However, the populations followed a normal curve, increasing in late July and into August. Any potato fields with some level of PVY could be the source of inoculum for disease vectored by these aphid populations. Aphids can vector the virus from infected commercial fields into neighboring disease-free certified seed fields. Certified seed fields with low levels of PVY can also be a source, increasing the PVY percentage within that seed lot. Seed Department staff visually inspects for, and serologically tests against PVY in the lab to estimate levels in the seed lots.

Chemical drift, particularly glyphosate, continues to be a concern to certified seed growers. Glyphosate

is commonly used on other crops engineered for resistance which may be planted near or adjacent to certified seed potato fields. Drift from applications, or residue from improperly cleaned spray tanks can injure potato plants. Tuber quality can also be affected, compromising seed piece germination the following year. All growers planting herbicide resistant crops should refer to “Effect of Glyphosate on Potatoes” [www.ag.ndsu.edu/pubs/plantsci/rowcrops/a1642.pdf](http://www.ag.ndsu.edu/pubs/plantsci/rowcrops/a1642.pdf), published by Dr. Andy Robinson, Extension Potato Agronomist, NDSU and Dr. Harlene Hatterman-Valenti, Professor, NDSU.

The cycle of seed potato certification will continue as North Dakota certified seed growers randomly select tubers from 2018 crop seed lots requiring a post-harvest test. Test results will determine seed lots eligible for certification for the 2019 crop.

## New Seed Plant at Carrington REC

This fall the new Foundation Seed conditioning facility at the NDSU Carrington Research Extension Center (CREC) will become operational. This is a milestone event, because it marks the first major upgrade within the North Dakota Agricultural Experiment Station Foundation Seedstock Program in decades. It also demonstrates the state’s long-term commitment to providing high quality seed of publicly developed varieties adapted to our region.

The CREC seed conditioning facility first began operation in 1963 and has remained largely unchanged since. But with the increase in the number of crops and varieties and the volume of seed being conditioned at the facility, a new seed plant was necessary to continue providing high quality Foundation class seed to the state’s seed growers. In recent years the program has conditioned 50,000 to 60,000 bushels of seed representing up to 35 different varieties of a dozen different crops with a wide range of seed sizes and densities.

The new facility will enable CREC staff to condition Foundation seed more efficiently and allow for easier and more effective clean-down to maintain varietal purity, while providing a safe work environment. A new air screen, indent mill and gravity table are in place now, with space defined for an optical sorter at a future date when funding is available.



**North Dakota State Seed Department**

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# NDSSD Calendar

**Nov 27** ..... State Seed Commission meeting - Fargo

**Dec 3** ..... SE District Crop Improvement meeting - Casselton

**Dec 4** ..... SW District Crop Improvement meeting - Dickinson

**Dec 5** ..... NW District Crop Improvement meeting - Minot

**Dec 6** ..... NE District Crop Improvement meeting - Devils Lake

**Feb 6-7** ..... NDCISA annual meeting - Bismarck

**Feb 19** ..... NPPGA Research Reporting Conference - Grand Forks

**Feb 20** ..... NDCSPGA annual meeting - Grand Forks