



# The North Dakota Seed Journal

MARCH 2010

Newsletter of the North Dakota State Seed Department

## Inside

- 1 ND State Seed Greenhouse Production and Tissue Culture Facility
- 2 From the Commissioner's Desk
- 2 Fall Weather Problems Costly to Seed Producers
- 3 New Certification Rules Approved
- 3 Prischmann Earns Registered Genetic Technologist Certification
- 3 Royalty Notice
- 3 Final Certification Fees to Increase
- 4 Pulse Crop *Ascochyta* Test Results
- 4 Understanding Seed Label Requirements
- 5 Variety Identification Testing Now Required for Some Crops
- 6 Calendar

## ND State Seed Greenhouse Production and Tissue Culture Facility

*Willem Schrage, Potato Program Director*

Rapid multiplication of disease free potato seedstocks is the primary objective of the Seed Department Potato Seedstocks Program. While some facilities in the U.S. have ceased operations, the Seed Department program has grown, supplying products for the potato industry in several states. The department is committed to providing growers with high quality, disease tested seedstocks.

Utilizing tissue culture, greenhouse production and extensive disease testing, the program continues to meet the needs of our customers. The department's efforts are geared toward accelerating the production of seedstocks to make varieties available to seed producers as quickly as possible while reducing the occurrence of bacterial diseases. In the last eight years total seed production in the greenhouse has increased 26%. We have also learned how to increase productivity of specific varieties. In that time for example, greenhouse yields have increased 21%, 37% and 91% for Dark Red Norland, Russet Norkotah and Dakota Pearl, respectively.

The facility also maintains a large tissue culture bank from which seed potato growers can obtain material for multiplication and plant breeders can obtain clean seedstocks and parent materials for research. The tissue culture bank is also recognized by the USDA as an official repository for varieties protected under Plant Variety Protection. It takes considerable time and effort to maintain such a tissue culture bank. Several students are regularly busy cutting plantlets to maintain their viability in tissue culture.

Access to clean seedstocks of new and old varieties is necessary to maintain the strength of the ND seed potato industry. While genetic modification of existing varieties would make the efforts to maintain low virus content in seedstocks much easier, the lack of access to markets of such material makes it a technique that will have to wait until a better understanding develops. While many countries have accepted biotechnology, markets for potatoes in North America do not seem to be ready for it. The challenge to the seed potato industry to provide potato growers with virus tested seed potatoes is great, and the Seed Department continues to do everything we can to assist seed potato growers in their efforts.

Contact Deb Baer (dbaer@ndseed.ndsu.edu) if you have any questions about potato seedstocks.

North Dakota State

**NDSSD**

Seed Department

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## From the Commissioner's Desk

Readers of my column have become accustomed to seeing articles containing timely or topical issues, philosophical ideas about the seed industry or thoughts about the Seed Department. This quarter, I hope the topic delivers in all three areas. Today's issue is change.

Many of you received a letter from my office in January that explained a change that is taking place in one of our programs/services to the industry. This article doesn't expand on the letter as much as reaffirms the upcoming change for those who aren't aware.

The Seed Department has collected royalties since 1999 on NDSU crop varieties for the owner, the NDSU Research Foundation. We performed this service because the Seed Department has the resources, information and business relationship with growers to efficiently and effectively run the collection program. This seemed to be a good fit for everyone involved over the past decade.

Last summer we entered into discussions with NDSU/RF for the purpose of renegotiating the collection agreement. Negotiations were long and often difficult, and in the end we failed to come to agreement, and have severed the relationship with NDSU/RF regarding collection of royalties. The most impor-

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Jeff Prischmann..... Diagnostic Laboratory Manager  
Kris Nicklay ..... Administrative Officer  
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tant part of the message is: the Seed Department is no longer responsible for collecting NDSU royalties as of January 1, 2010.

This has been much like a no-fault divorce: both sides feel strongly about their position, but at some point we just need to move on. You should notice that I'm not placing blame or leveling criticism, I believe we are beyond that.

I work on the philosophy that a well-informed constituency or audience, while perhaps not liking your message, is happier than the uninformed one. My experience is that unpleasantly surprised people take a whole lot more work than informed people. The purpose for discussing a decoupling like this in print is to create an informed constituency, and let you know that despite the failure (by both parties) to keep the royalty collection process simple and customary ... that a change is coming. Good or bad, transparency

in communication is the standard we believe important and owed to our partners in the seed industry.

These changes only affect NDSU varieties. The Seed Department will continue to collect research fees on sales of varieties from Busch Ag, South Dakota State, U of Minnesota and Montana State. We will continue to work with you to reconcile those accounts.

Lastly, this is a quote from the letter sent in January. It is probably the most important piece of information for the industry and our customers, and reads:

*"We appreciate the working relationships we have shared over the years and look forward to continuing to serve your needs in seed certification, testing and regulatory protection in the future."*

Best wishes for a busy, safe and profitable spring season,

## Fall Weather Problems Costly to Seed Producers

Mark Hafdahl, Seed Lab Manager

In September and October, I was remarking about the good seed quality we had this year. Perhaps I was a little premature in my assessment as additional lab samples have revealed problems caused by late maturing crops and excessive moisture at harvest.

Most of the small grains were harvested prior to the rains setting in and those are of very good quality. The exceptions are those fields that were sprayed with a pre-harvest desiccant. Germination results on these seed lots are dismal and warrant additional warning. Glyphosate is not recommended as a harvest aid in crops grown for seed. Germination will be reduced.

Soybeans that were harvested prior to the fall rains are also of very good quality and I anticipate no problems with them. However, some fields didn't completely mature and contain oblong, green beans. Soybeans that spent October in the field are the lowest quality beans I have seen in my 31 years of seed testing. Even the lots that appear to have matured suffered from repeated wetting and drying, producing misshapen beans with some seed coat damage.

I think the soybeans can be cleaned to produce satisfactory seed, but the percent of clean out will be high. I would not recommend carrying over any soybeans that were in the field during the rains of October. I suspect the germination will fall rather rapidly on these lots.

## New Certification Rules Approved

Steve Sebesta, Deputy Commissioner

In December the Seed Commission approved a number of changes to seed certification regulations. The scope of the changes ranged from general requirements such as seed eligibility, field eligibility, and issues related to handling certified seed to changes in field and seed standards for a number of specific crops. The most important changes were communicated at the North Dakota Crop Improvement and Seed Association meetings earlier this winter. An open comment period was held between January 25 and February 8. We appreciate the assistance of Ducks Unlimited, the Northern Pulse Growers Association and the North Dakota Dry Edible Bean Seed Growers Association. Good communication is essential in maintaining a strong certification program for the seed industry.

### Field inspection applications

**Grasses** — We have changed our inspection method for certified grass fields. In addition to the usual inspection after the crop has headed, we now require a spring inspection which should enable us to locate prohibited weeds. Identifying these trouble spots should allow the growers to manage problems better. This inspection requirement means the application for field inspection must be submitted by May 1.

**Soybeans** — For soybean varieties that only require a single inspection prior to harvest, we have moved the application deadline back to August 1. This applies to certified seed fields and those in the Quality Assured program.

### Sampling, conditioning and lab inspection

We have added lentils and chickpeas to our list of fragile crops. Therefore, germination tests must be conducted after final conditioning.

### Maximum lot size

The maximum size of a bagged lot is now 5,000 bushels. And, the entire lot must be certified at the time final certification is completed.

### Field eligibility requirements

**Winter wheat** — Our field research has shown that volunteer spring wheat is not a significant problem in winter wheat fields, so we changed the requirement and now permit winter wheat to be planted on fields that previously produced spring wheat.

**Soybeans, chickpeas, lentils and field peas** — Prohibiting the production of one type of pulse crop on land that had previously produced another type of pulse crop did not make sense as long as the two crops were not inseparable. Seed borne disease such as *Ascochyta* blight is not an issue due to host specificity.

### Field and Seed standards

**Lentils** — Based on industry input we changed the seed standards for Other Crop to 1 per 2 pounds, 1 per pound and 3 per pound for Foundation, Registered, and Certified classes, respectively.

**Dry beans** — Common Blight standards were changed to 0.05% and 0.1% in Registered and Certified classes, respectively.

All the details may be viewed on our website. Go to [www.ndseed.com](http://www.ndseed.com), click on *News* then on *Proposed rule changes*.

## Prischmann Earns Registered Genetic Technologist Certification

Jeff Prischmann, Diagnostic Lab Manager, received certification as a Registered Genetic Technologist through the Society of Commercial Seed Technologists (SCST) in November 2009. Requirements for certification as a Registered Genetic Technologist include passing written and laboratory practical examinations in three of the four genetic technology testing areas including: herbicide bioassay, ELISA, Electrophoresis, and PCR. The SCST has a several different membership categories and certifies individuals conducting seed testing in a number of areas including germination, purity, as well as genetic testing.

### NOTICE

Effective January 1, 2010 the State Seed Department discontinued royalty collection services for NDSU. If you sell seed of NDSU varieties, make sure you keep accurate records of your sales activity.

## Final Certification Fees to Increase

Steve Sebesta, Deputy Commissioner

Proposed changes to the final certification fee structure were approved by the Seed Commission in December. These changes were communicated at the ND Crop Improvement and Seed Association meetings in December.

Previously, labelers were assessed fees according to a two-tiered fee structure based on the type of container in which the final product was placed (bagged vs bulk). That antiquated system no longer made sense, since the final certification process is identical for all seed, and requires the same amount of work regardless of container type. As a result, the Seed Department will assess final certification fees uniformly for all seed at a rate of six cents per bushel, bagged or bulk. The rate for bagged seed did not change; the bulk seed rate increased two cents per bushel. The new rates will go into effect July 1.

# Pulse Crop *Ascochyta* Test Results

Jeff Prischmann, Diagnostic Lab Manager

*Ascochyta* testing in pulse crops this season is well under way. The 2009-2010 crop of chickpea, lentil, and field pea has shown increased levels of this disease-causing organism compared to previous years. This may be partially due to the cool, damp growing conditions that existed during the 2009 growing season. We frequently receive questions as to what amount of *Ascochyta* is considered high in a sample.

*Ascochyta* tests on pulse crops are conducted using a 500 seed sample. Results are reported as the percentage of infected seed. Small amounts of *Ascochyta* sp. may be acceptable depending on the type of crop. For example, field pea may have a higher acceptable level of *Ascochyta* sp. than other pulse crops such as chickpea.

For certification of pulse crops, labelers are required to test each lot for *Ascochyta* and the test result must be shown on the label. While there are no seed standards established for *Ascochyta* in pulse crops, here are some general guidelines:

- **For chickpeas**, 0.3% seed infection or less is acceptable. A test score 0.4% or greater is not acceptable for chickpeas. In this case, we recommend buying new seed.
- **For lentils**, 0.5% seed infection or less is considered acceptable. Levels of 0.5% to 1.0% are considered ok, however, growers are cautioned to monitor fields closely for infection. Lentil *Ascochyta* infection levels of 1.0% to 3.0%

*Pulse Crop continued on page 5*

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## Understanding Seed Label Requirements

Joe Magnusson, Seed Regulatory Manager

Whether labeling or purchasing seed, it's important for everyone to understand the seed label.

**Kind and Variety** – Kind of crop (wheat, barley, alfalfa, etc.) must always be given. For wheat, durum, barley, oats, rye, soybeans, edible beans and flax, the variety name must be stated. If the seed is a mixture of varieties, each component in excess of five percent of the whole must be named, together with the percentage by weight. When more than one component is named, the word "mixture," must be shown on the label.

**Lot Identification** – A number or other lot identification is used by the seller to identify a definite quantity of seed of uniform quality and represented by given seed tests.

**Pure Seed** – Indicates percent of purity as to kind of crop and also as to variety, if named. In most cases, however, variety cannot be identified by seed characteristics; therefore laboratory analysis reports carry a statement: "varietal purity guaranteed by labeler." The pure seed percentage is then based on kind of crop only. A certified tag gives added assurance of varietal purity. Variety labeling is the responsibility of the labeler.

**Other Crop Seed** – Percent by weight of other kinds of crop seeds.

**Weed Seed** – Percent by weight of weed seeds. Weed seed cannot exceed one percent.

**Inert** – Anything that is not a seed (by definition) is considered inert and may include chaff, sticks, dirt, cracked seed, etc.

**Prohibited Noxious Weeds** – Any seed lot containing prohibited noxious weed seeds is PROHIBITED FROM SALE. These weeds are field bindweed, leafy spurge, Russian knapweed, hoary cress, Canada thistle, perennial sowthistle, absinth wormwood, hemp having more than 0.3% THC, musk thistle, spotted knapweed and yellow starthistle.

**Restricted Noxious Weeds** – The tag must show the name

and number per pound of each restricted noxious weed present singly or collectively in excess of five for small grains and seed of similar size, and in excess of thirteen in grasses and small seeded legumes. Restricted noxious weeds include: quackgrass, dodder, wild oats and hedge bindweed. The maximum allowable limit for these seeds is 25 per pound in aggregate.

**Germination** – Gives percent of seed capable of producing normal seedlings during the standard laboratory germination test.

**Hard seed** – This is the percent of seed that did not germinate during the standard germination test because of an impermeable seed coat. Hard seed may germinate at a later time.

**Germination and hard** – This is the total of germination and hard seeds. The sum of the germination and hard seed cannot be labeled as "total germination."

**Date of Test** – The calendar month and year the test was completed. A germination test must be completed within nine months prior to sale or transportation of the seed, not including the month tested for agricultural seed, twelve months for flower, vegetable, native grasses and forbs and fifteen months for cool season lawn and turf grasses.

**Origin** – Shows the state or foreign country where the seed was grown. If origin is unknown, that fact must be stated.

**Name and Address of Labeler** – The party who labeled the seed or who sells the seed in this state.

*OPTIONAL:*

**Disease Test Result** – Results for seed borne diseases are specified. Certification regulations may require labeling disease test results for some crops. Consult department regulations.

NOTE: Seed found by the State Seed Department to be incorrectly labeled is subject to a "stop sale order" and cannot be moved, used or sold until it is properly labeled.

# Variety Identification Testing Now Required for Some Crops

Steve Sebesta, Deputy Commissioner

Beginning with the 2010 crop, the Seed Department will require variety identification testing as part of the certification process for spring wheat, barley and field peas. The new rule will supplement the current procedures involving field inspection and lab testing. There will be no additional charges for the genetic tests as those costs will be covered by the increase in final certification fees (see related article).

## Variety testing creates additional value in certified seed products. Here's how.

- Increased consumer confidence that the products they purchase are correctly identified and have the genetic potential to deliver the traits expected
- Provides bulk retailers confidence that the varieties they purchase for resale are properly identified
- Provides variety owners confidence that the variety being produced and sold by independent seedsmen are properly represented
- Builds confidence in product performance on the farm or by the end user
- Provides an additional level quality assurance
- Provides traceability for seed regulatory and PVP enforcement issues
- Provides seedsmen traceability if product liability claims arise
- Provides end-users traceability to the seed source planted (IP programs)

Variety identification tests are conducted by the Diagnostic Lab using seed protein or seed DNA. Since seed proteins are products coded by DNA, both types of tests are able to identify the unique fingerprint of a variety. These tests are also used to determine the identity of an unknown seed sample.

The seed protein test will be utilized for variety identification in wheat. This test is relatively simple and is recognized by the USDA Seed Regulatory and Testing Branch as the most effective tool to identify

wheat varieties. For this test, seed proteins are extracted from a seed sample and the technique of electrophoresis is used. Electrophoresis separates the mixture of seed proteins, using a gelatinous support medium or gel. A small amount of sample is applied to the gel and an electric current is applied, allowing the charged molecules to migrate through the gel. The proteins separate based on their size. A special stain is used to reveal the banding pattern or 'fingerprint' for a particular variety. Known control samples are run with test samples providing positive identification by means of visual comparison of the banding patterns. Samples that do not match the control are either mixtures or another variety.

In the case of barley and field peas, a seed DNA test is conducted. This test uses a process known as polymerase chain reaction or PCR. Seed DNA is subjected to PCR using specific genetic markers for the variety of interest. Multiple markers are required to differentiate certain varieties of barley or peas from each other. PCR products are then visualized using

electrophoresis. As with a seed protein variety identification test, known control samples are tested with the samples.

Positive variety identification through field inspection alone has certain limitations. Even though a detailed variety description is provided by a plant breeder, and required by AOSCA certification agencies as part of the variety eligibility requirements, many of the traits are highly influenced by the environment. This means the traits may be expressed differently from one location to another. In some cases, such as in field peas, there is no variation in the observable traits. For example, all of the varieties inspected by the Seed Department in 2009 were leafless and had white flowers. While the field inspector could conclude the variety matched the description, so would every other variety.

As with all testing issues, the reliability of test results and reports are only as good as the sample provided to the Seed Department. Those handling the seed throughout the seed production process are ultimately responsible for the quality of the product delivered to the customer. Beginning to end, the entire production process needs to be closely controlled.

As our knowledge of molecular genetics improves and testing techniques become more refined, additional tools have become available. The Seed Department believes that we should use all the tools we have available to do our job properly and create additional value in the certified seed produced and sold in North Dakota.

More details concerning variety identification testing will be communicated to certified seed growers, conditioners and bulk retailers over the next few months.



## *Pulse Crop continued from page 4*

require seed treatment and levels above 3.0% are considered unacceptable.

- **For field peas**, *Ascochyta* does not cause as many problems as in lentils or chickpeas. However, some sources consider infection levels of greater than 5% as too high. In this case, growers or producers may want to look for other seed sources.

Seed treatment is recommended for any seed with a detectable level of *Ascochyta* sp, regardless of the crop.

The bottom line on any seed health test is to look at the results in relation to the crop and consider sourcing different seed if the results are high. Most seed-borne diseases need optimum conditions to spread during the growing season. So, just because a pathogen is present in a sample doesn't necessarily mean that the disease will develop in the field next year. However, it is more likely that the disease will be present in the field the next year with increasing levels of seed infection. Please contact the department with any questions or comments.

## North Dakota State Seed Department

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# NDSSD Calendar

- May 1** ..... Field inspection applications due for grasses
- June 15** ..... Field inspection applications due for all crops except conventional soybeans, buckwheat and millet
- July 1** ..... Bulk certificates due
- July 15** ..... Field inspection applications due for buckwheat and millet
- July 31** ..... Labeling Fee Report due
- August 1** ..... Field inspection applications due for soybeans requiring single inspections
- Sept. 15** ..... Research fees due