



The North Dakota Seed Journal

JANUARY 2015

Newsletter of the North Dakota State Seed Department

Inside

- 1 From the Commissioner's Desk
- 2 Vomitoxin Testing in Wheat and Barley
- 2 Administrative Corner
- 3 Considerations for 2015
- 3 2015 Approved Plant Inspections
- 4 Seed Quality
- 5 Seed Retailers Offered Tips for a Successful Season
- 5 Farmers Yield Initiative
- 5 Potato Viruses: Ongoing Seed Industry Problem
- 6 Calendar

From the Commissioner's Desk

Some folks get anxious on the eve of a Legislative Session. That's understandable if there is a big policy issue or big money at stake in your particular area of interest. Variables involving politics, public opinion and budget make for an edgy few months, even in North Dakota where these issue areas are fairly stable.

Me? I love the legislative session, always have. I have a great appreciation for the process and people involved and find it fascinating to watch everything come together. Unfortunately there aren't many high profile agriculture issues in the state session any longer. Perhaps it's because so many ag issues are federal in nature or scope, or we've got all the state-level problems solved. Yep, that's it.

I seldom preview legislative issues in Seed Journal, opting to do some overviewing around crossover or late in the session. I'm making an exception here to discuss an issue whose time has come.

The Department has a bill drafted that would be considered "housekeeping" legislation. We've worked with Senator Terry Wanzek (a seed grower and good friend to the Department) and Legislative Council to draft language that clarifies cover crop labeling in seed laws, creates consistency in warranty disclaimer language across all of our code chapters, along with a few other minor adjustments.

The bill also contains language to increase the maximum penalty for violation of seed laws from the current \$5000 to \$10,000.

The ag industry has changed immensely over the past few years, especially in the input costs arena. The cost of developing and releasing varieties has followed a similar pattern. Seed piracy, brownbagging, illegal sales of protected seed; the variety owner and the seed industry both lose. Any time a bushel of illegal seed is sold, the variety owner loses revenue/royalties, less money is available for public or private variety development, and a seed grower/retailer loses a sale. The deterrent (in the form of fines) to seed piracy has lessened as the cost of seed has increased, which is precisely why this issue is timely.

The measure doesn't change seed intellectual property protection laws; those are federal in nature. It doesn't change state seed laws; the regulations governing labeling and handling of seed products stay the same. Violation of any state seed law remains a misdemeanor, the **maximum** penalty simply increases. The Department, within its regulatory authority, has never utilized the maximum penalty amount except in instances of violation of PVP laws (labeling violations commonly carry a \$250-500 fine). The Department will continue to work with public and private variety owners to protect their intellectual property rights, with a bit more muscle.

This provision should gain support, especially from entities that develop, release and market PVP varieties. Public and private seed breeding programs, growers associations, seed retailers, and seed growers all benefit from stronger penalty provisions. In practice, the Department may discover violations and levy penalties, or take action behind a variety owner that has pursued legal action against a violator. This "teamwork" activity serves the interest of the variety owner, and it helps ensure the viability and value of the seed industry.

Will anyone be anxious about increasing fines? I'm unsure what basis there may be for opposition, but it may prove to be an interesting discussion.

Best wishes for a safe and profitable New Year.

North Dakota State

NDSSD

Seed Department

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.

N.D. State Seed Department

(701) 231-5400 Fax (701) 231-5401

ndseed@ndseed.ndsu.edu

www.ndseed.com

Vomitoxin Testing in Wheat and Barley

Jeff Prischmann, Diagnostic Laboratory Manager

Higher levels of moisture and cooler temperatures during this past growing season in many parts of North Dakota were good for the development and spread of Fusarium Head Blight (FHB). FHB is caused by the fungal pathogen *Fusarium graminearum*. FHB primarily infects wheat and barley kernels during flowering when wet weather is present. One of the problems with FHB is that it produces a mycotoxin known as deoxynivalenol (DON). DON is also commonly called Vomitoxin.

FHB causes kernels to be shrunken, chalky white in color, or to have no visible damage depending upon the kernel development stage that infection occurred. Some of these infected kernels can be removed from seed lots during the seed cleaning process and thereby reducing vomitoxin levels in a seed lot. The removal of infected seeds ultimately increases the percentage of vigorous kernels and germination.

The amount of vomitoxin present in a lot of seed or grain is important. Vomitoxin levels are reported in parts per million (ppm). This is equivalent to one wheat kernel in 1 million wheat kernels. The Food and Drug Administration has issued advisory levels for DON in finished wheat products for human consumption and in grain and grain by-products used for animal feed. Recommendations for human consumption are 1 ppm DON on finished wheat products. Recommendations for animal consumption on grain and grain by-products are 5 ppm DON for non-ruminating animals and 10 ppm on ruminating animals. DON can

cause acute gastrointestinal illness if consumed at high enough levels.

The North Dakota State Seed Department Diagnostic Lab conducts vomitoxin testing in cereals using a quantifiable lateral flow strip test procedure. This test gives very accurate DON readings from 0 to 12 ppm. The price for this test is \$50 per sample. Flow strips are antibody based tests and test specifically for the DON compound. Sampling is very important for testing. A good representative sample of the seed lot is necessary to obtain an accurate vomitoxin test result. This usually means taking several sub-

samples while a bin is being filled and making a composite sample or taking the appropriate number of probes from trucks or bins to make a composite sample.

A very good source of information on vomitoxin is the NDSU Extension Service bulletin PP-1302 titled "DON (Vomitoxin) in Wheat: Basic Questions and Answers". Not only does this publication explain what vomitoxin is, but it also explains critical levels of DON in seed and how DON levels are measured.

For more information on vomitoxin testing, please contact the department.

Administrative Corner

Kris Steussy, Administrative Officer

On-line Data: We apologize for any inconvenience you may have experienced in accessing on-line data on our web page. We have corrected the issue and your data should again be accessible.

On-line data allows customers to securely look up information on field inspections, laboratory testing and final certification through our web page. If you are currently not using our on-line data and are interested, please contact us for instructions.

We will be re-designing/re-developing our on-line data in the near future and hope to provide new options in receiving and transmitting information.

Email Results: Do you know that the Seed Department can email your seed testing results? If you would like to have results sent to you by e-mail, please contact the Department with your email address. Results will be emailed as tests are completed.

Log Sheets: In reviewing the Bulk Certificate Log Sheets that have been returned to the Department, we have seen several errors that have occurred when seed facilities are issuing Bulk Certificates. The biggest problem appears to be over-selling the seed lot. The following may benefit your facility and avoid a call from our department:

Report the number of bushels from the certification report on the log sheet and adjust for each sale. If you are running out of bushels for the lot, did you: (a) receive all the certificates from the seller for the bushels purchased from the lot, (b) send all the certificates from the lot to our department when you relabeled the seed, (c) issue certificates from the wrong lot or bin of seed, or (d) underestimate the bushels conditioned or carried over when the lot was submitted for final certification?

If one of the above has occurred, call the Seed Department and we can help you rectify the problem.

Ken Bertsch..... State Seed Commissioner
Willem Schrage Director, Potato Program
Jason Goltz.....Director, Field Seed Program
Joe Magnusson.....Field Seed Program Manager
Jeanna Mueller.....Seed Laboratory Manager
Jeff Prischmann...Diagnostic Laboratory Manager
Kris Steussy Administrative Officer
Mike OosterwijkPotato Program Supervisor

Considerations for 2015

Jason Goltz, Director of Field Seed Programs

While planning for the 2015 certification season, a number of important factors should be kept in mind. Cropping history and crop rotations are addressed in each chapter of Article 74-03 NDCC, seed certification standards, with a paragraph titled *Land Requirements*. Overlooking the history of the field could lead to problems later. Another important issue is the degradation of quality in some seed due to disease and weathering in the crops grown in 2014.

Crop Rotations

Seed crops have rotation requirements which can sometimes limit planting choices depending on cropping history. An improper rotation could lead to a rejected field inspection application. Most small grain and flax crops require that the preceding crop be a different kind of crop unless the previous crop was the same variety and was inspected. An exception to this rule would be that winter wheat may be planted on a field that had previously grown spring wheat.

Durum has different requirements than most other crops. To plant durum that is to be inspected as foundation or registered class, the field must not have produced spring wheat for the previous two seasons. For the 2015 year, this means that the last spring wheat crop on these fields would have been during 2012. Durum crops inspected as certified class only need a one year break from spring wheat to be eligible. The recent increase of Carpio durum and the current release to the County Increase Program of Joppa durum may lead to increased interest in growing durum.

The 2014 season showed a much more noticeable presence of volunteer soybeans. There is no solid explanation as to why soybeans volunteered more this year than in previous years. Biological systems have mechanisms for survival and this is true with all crops. One possible explanation is that soybean seeds from the two preceding years germinated in 2014. It is likely that seeds from the 2012 crop did not germinate in 2013 due to the drier weather in 2012, which may have caused a deeper physiological dormancy in the seed. Since the cause isn't understood, it is difficult to predict if it will happen again or if it was an isolated weather-related phenomena. Either way, next year's fields may have to be inspected carefully for previous year's soybeans. Fields planted to soybeans for seed production may have to consider changes in crop rotation if the volunteerism continues.

Seed Quality

Seed quality issues can be attributed to the late summer rains which limited field access and led to harvesting outside the optimum time frame. This caused weathering which, in turn, not only reduced seed quality but also caused sprout damage in some areas due to the higher precipitation and humidity. Sprout damage can be initiated when a seed reaches physiological maturity and then comes out of dormancy due to a high-moisture environment. In some cases, a seed can be visually distinguished by seeing a green sprout or the beginnings of a root, but that isn't always the case since sprout damage isn't always visible.

A seed can go back into dormancy and re-germinate if the initial germination is not too far along. This seed, however, cannot be expected to be as vigorous in the field as another that has not gone through the initial stages of germination. The sprout damaged seed may have several problems due to prematurely using some of its energy stores. These may include: an inability to break the surface, reach the initial vegetative stage or to effectively compete in the field.

Scab was more prevalent during 2014 in durum, winter wheat and early planted spring wheat. Scab (*Fusarium Head Blight*) is a fungus that produces a toxin commonly referred to as vomitoxin or DON which damages the infected seed. The fungus will not continue to grow in storage if conditions are dry, but the affected seeds can continue to deteriorating. Affected seed lots may have lower germination rates will need to have their planting rates adjusted accordingly.

When planning for the upcoming 2015 season, look closely at your cropping history to see if there could be potential problems with certification and call if you have any questions. Make sure to scout fields with a history of soybean production; there may be volunteers again. Finally, since sprout-damaged or scab-infected seed can continue to deteriorate in storage, consider having another germination test performed in the spring if the seed was conditioned, tested and labeled in the early fall or winter.



2015 Approved Plant Inspections

Kyle Bednar, Field Seed Inspector II

The approved facility inspection is wrapped up, we started this process in early October and finished mid-December. I would like to take this opportunity to thank my fellow inspectors for another successful year, and the facility managers and staff for the support shown while we were on site conducting the inspection.

Managers should have received the current Approved Plant Permit in the mail along with a copy of this year's inspection report. Please display the permit, review and retain your copy of the 2015 plant inspection report.

In order to continue to have another successful upcoming seed season, here are a couple requirements to keep in mind.

- Be sure that seed bins and equipment are cleaned before certified seed is handled.
- Keep an up-to-date bin chart and label your bins.
- Retain a two pound sample of each lot and label with lot, class and variety.
- Issue the buyer copy and retain your portion of bulk certificate for each sale.
- Return all unused bulk certificates and log sheets at final disposition of the lot, or by September 1st to the State Seed Department.

Be sure to monitor your seed bins closely for any signs of heating or insect damage that may occur during the winter months due to the fluctuating temperatures.

I encourage you contact the State Seed Department office or your inspector if you have any questions.

Seed Quality

Jeanna Mueller, Seed Lab Manager

As of mid-December, the North Dakota State Seed Lab has received close to 4,000 samples this year since July 1st. We had a busy November with soybeans coming in and we will have a busy January with an expected 800-1,000 canola samples coming our way in addition to the normal load of certification and service testing in other crops. Usually by December we have all of our staff in house including part-time people. We have one part-time college student who is studying Botany helping out with planting and filing this year.

Barley quality is lower than average this year. We have seen some issues with sprout damage and musty seed, possibly due to harvest delays in parts of the state where barley was laying in swaths.

Winter wheat was definitely affected by environmental conditions this year. Most of our samples have come into the lab with varying degrees of scab damage. Hard Red Spring wheat quality is average. Some of the earlier planted wheat was more affected by scab.

Soybean quality is average to higher than average. We have not seen many lots with mechanical damage like in previous years, which is surprising given the dry harvest conditions throughout much of soybean harvest. Field peas are lower quality than average this year. It may have something to do with the time of year it was harvested, and field conditions.

Durum seed quality is lower than average. We are typically very cautious when planting durum due to its susceptibility to scab. Generally, sample must look excellent before we will plant it in 100 seed replicates. Just recently, we had some samples we planted in 100 seed replicates (because they looked really good) and when the germination test was read the samples came back in the range of 50-60% germination. We ended up replanting them in 50 seed replicates to spread out the seeds. This is a lesson for us as analysts, for the

grower and the buyer that looks can be very deceiving (see the following article with pictorial evidence of this issue). We have also seen some lots from 2012 that scored better than this year's crop.

Looks Can be Deceiving

The saying "you can't judge a book by its cover" may be an apt descriptor for some of the seed lots that have come to our lab for germination this year. Scab, sprouting and frost this year will show a decrease in germination even if the seed may appear undamaged and of high quality.

We have seen some seed lots that are infested with tombstone (scabby) kernels that we assumed would be around 50% to 60% germination that actually germinated in the low 80's. We have also seen some durum seed lots that appear to be of high quality but germinated in the 55% to 65% range.

The images below are from a durum seed lot that was conditioned and appeared to be good quality and the resulting low germination score which appears to be scab related. The image on the right is from the same seed lot after a seven-day germination test showing the pink fungal sporulation and reduced germination associated with fusarium infection.

Having seen this result a number of times early in the testing season, NDSSD is planting all durum germination samples in 50-seed replicates rather than the standard 100-seed number. This practice reduces the incidence of scab infection transferring to nearby seed and negatively affecting germ scores.

Seed treatment may be a very good investment this year. It is always important to get your seed tested whether it's this year's crop or carryover. I hope everyone has a healthy and prosperous new year!



Seed Retailers Offered Tips for a Successful Season

Each year, in late winter through early May, Seed Department Regulatory inspectors hit the road to inspect facilities that sell seed. The inspections include an audit of sales and seed labeling records. In addition, a major part of the program entails sampling seed available for sale at the facility. Those samples are returned to the Seed Department for purity and germination tests and in some crops variety ID testing to determine whether the bulk certificate or seed tag for that lot of seed accurately represents the sample collected. The Federal Seed Act and North Dakota Seed Laws have specific requirements for labeling. One may view seed regulatory inspections as truth-in-labeling activities.

To help ensure compliance with seed laws and minimize the risk of a “stop sale order” on a seed lot, the North Dakota State Seed Department offers these tips:

- Label bins with variety and lot number to ensure the buyer receives the correct variety at the time of purchase.
- Make sure bins are thoroughly cleaned before filling them with clean certified seed.
- Thoroughly clean all handling equipment. Augers must be reversible to permit proper cleaning.
- After filling a bin with seed, check the first few bushels for contaminants, or damaged or split seed.
- Handle fragile crops such as soybeans, field peas, and field beans with care to prevent damage. These seeds are especially susceptible to damage during handling.
- Monitor bins frequently to ensure the seed does not go out of condition.
- Re-label carryover seed to show new germination and test date prior to sale. In most cases, the germination test is valid for nine months excluding the month it was tested.
- Certified seed samples must be retained for two years from the date of final disposition of the lot.
- Complete and accurate records must be retained for three years.

Call the Seed Department if you have any questions about seed regulatory matters.



FARMERS
Yield
INITIATIVE

The Farmers Yield Initiative, or FYI, promotes legal seed trade, research, education, seed certification, and the enforcement of intellectual property rights authorized under the Plant Variety Protection Act (PVPA) and patent laws. The purpose of the initiative is to educate the public and encourage compliance with existing state and federal seed laws embodied in the PVPA and state seed certification regulations.

If you suspect illegal seed activity please consider submitting a strictly confidential tip to help put a stop to illegal seed trade. You need not identify yourself during the phone call. The caller can remain anonymous, and it is toll-free.

Phone completely confidential tips using the toll free number: **(877) 482-5907**

Email tips to: tips@farmersyieldinitiative.com

Mail tips to: Farmers Yield Initiative
PO Box 8850
Fayetteville, AR 72703

Potato Viruses: Ongoing Seed Industry Problem

Willem Schrage, Director of Potato Programs

During the annual meeting of the U.S. Seed Potato Certification Agencies, a major emphasis on proposed research was still on potato viruses. While PVY is still the most important potato virus for seed potato growers other viruses such as Potato Mop Top Virus (PMTV) and Tobacco Rattle Virus (TRV) are gaining in importance. PVY is spread by aphids, while PMTV is spread by the organism causing powdery scab and TRV by free living nematodes. The introduction in a field of one of the latter two viruses may cause long-term damage to the seed operation as the virus disease becomes soil borne. One objective of the proposed research is to get a handle on PMTV and TRV before they become greater problems.

Reducing the spread of PVY will become more important for commercial growers when new strains show tuber necrosis. Dr. Stewart Gray (USDA/ARS) stated during the meeting that they are observing a decrease in common PVY and an increase in recombinants of PVY that show mild visual symptoms, e.g. PVYNO or PVYNTN. Therefore it is important to apply laboratory testing to detect PVY. The increase in PVY with mild symptoms is more obvious in following generations. Strains with mild symptoms may cause tuber necrosis, which has shown up in especially Yukon Gold.

The “Management Plan for Potato Viruses that Cause Tuber Necrosis” is proposed to be changed if it is to be a tool to reduce the occurrence of damage caused by PVY. Recommendations are for field grown seed state for example: “all seed going out of state should be certified, and a post-harvest test should be required for all seed going out of state”. The exception for a post-harvest test would be for seed lots that are shipped to areas outside of seed production before a post-harvest. The post-harvest test of potentially symptomless varieties should include laboratory testing such as ELISA. Tuber necrotic isolates of PVY are to be regulated through the inspection of seed shipments.

Preferably the same procedures should be considered for seed moving within a state.

Reducing inoculum is the only way to reduce damage from PVY. Planting certified seed is a first measure to be applied to reduce inoculum and the chance that tuber necrosis becomes a reason for rejection in the commercial industry. Second, knowing the virus content from the post-harvest test is necessary to determine the possible damage a seed lot may do in the area.

Most other recommendations in the Management Plan are standard practice in the US. However in very few states is a post-harvest test for all certified seed lots not standard practice. Nationally, there are discussions to make this a requirement for seed to be accepted in all states.

The website [www.Potatovirus.com] will be continued.

North Dakota State Seed Department

State University Station
P.O. Box 5257
Fargo, ND 58105-5257

Non-Profit Organization
U.S. Postage

PAID

Bismarck, ND
Permit No. 433

ADDRESS SERVICE REQUESTED

NDSSD Calendar

- Jan. 19-20** ND Grain Dealers Assn. Annual Meeting, Bismarck
- Jan. 26-27** Northern Pulse Growers Annual Convention, Minot
- Jan. 28-30** KMOT Ag Expo, Minot
- Feb. 4-5** ND Crop Improvement Assn. Annual Meeting, Bismarck
- Feb. 10-11** KFYP Agri International, Bismarck
- Feb. 17** Northern Soybean Expo, Fargo
- Feb. 18** ND Certified Seed Potato Growers Assn. Annual Meeting, Grand Forks
- Feb. 18-19** International Crop Expo, Grand Forks
- Mar. 3-8** ND Winter Show, Valley City
- Mar. 12** Seed Commission Meeting (tentative), Bismarck