



The North Dakota Seed Journal

APRIL 2017

Newsletter of the North Dakota State Seed Department

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Fusarium Testing in Cereal Crops

Jeff Prischmann, Diagnostic Lab Manager

One of the major diseases of cereal crops in North Dakota and the surrounding region is Fusarium Head Blight (FHB), commonly known as Scab. There are several species of the *Fusarium* genus of fungi that cause this disease. The predominate species is *Fusarium graminearum*. Another important species is *Fusarium culmorum*. Both species can infect barley, spring wheat, and durum wheat and also produce a vomitoxin known as deoxynivalenol (DON). DON is important because it is a mycotoxin and at high levels can cause digestive problems in humans and ruminant animals. The FDA has established advisory levels of DON for human food and animal feedstocks. Human food products are limited to a maximum of 1 ppm DON. High levels of DON in grain usually result in discounts when the grain is sold at the elevator. The presence of FHB does not mean that high levels of DON will be present in a seed sample. However, it has been reported that high levels of scabby kernels in a seed sample will likely have high levels of DON.



Fusarium agar plate test showing pinkish colored *Fusarium* sp. growing on infected durum seed.

FHB produces what are known as "tombstone" kernels that are white and shriveled in appearance. The presence of tombstone kernels generally indicates that a seed lot is infected with *Fusarium*. Many of these kernels have non-viable embryos and are essentially dead due to the *Fusarium* infection. These dead kernels then translate into poor germination test scores. Also, it has been reported that if the *Fusarium* infection occurs later on in the development stage of the seed that it may show little if any visual symptoms of FHB.

FHB is transmitted by infected seed which means that conducting a seed test that detects seedborne *Fusarium* is an important tool to help control the spread of FHB. Also, some countries such as Canada have restrictions on the movement of seed with high levels of *Fusarium* infection.

The Diagnostic Lab at the North Dakota State Seed Department currently offers a seed health test that can detect the presence of *Fusarium graminearum* in barley, spring wheat, and durum wheat and provides an accurate level of seed infection. This test is an agar based test that examines a 500 seed sample for *Fusarium* infection.

For individuals interested in DON levels, the Diagnostic Lab also provides a quantitative vomitoxin (DON) test that can detect DON levels from 0 to 10 ppm. This test is very accurate and provides a quick measurement of DON levels. High levels of DON do not necessarily mean that a seed sample will have a high level of FHB or *Fusarium* seed infection, however with higher levels of DON it is more likely the sample will have a high level of FHB. Please contact the department for more information regarding these tests.



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From the Commissioner's Desk

My cable bill went up a couple of months ago. No notification, no justification...it just went up. It's not the first time and probably won't be the last, but geez...couldn't they at least be a bit more up front about it? On second thought, the last time I did call and was told they had notified me. It was in the fine print somewhere.

You are now asking yourself "self, how is this genius going to connect cable TV services with seed?" Here you go.

In very simplified terms most businesses calculate costs of goods or services, build in profit margins, estimate sales and so on. We do something similar, except for the profit part; our main objective is to cover the costs of providing services as the designated authority for seed regulatory and certification work in North Dakota. As an agency of government, we are a quasi-nonprofit (hence the cost recovery attitude), and have a little less flexibility than private businesses in providing for any sort of product or service discounts, but otherwise attempt to set fees that allow us to operate in a fiscally sound manner. It's a fine balancing act as a self-funded agency. Your takeaway here should be that profitability really means "breaking-even" in our world.

We operate four main program areas: field crop certification (including field inspection and final certification), potato certification (field and shipping point inspections, foundation seed), laboratory services (seed lab and diagnostic lab) and seed regulatory inspection. Those program areas are evaluated as separate enterprises within the Department, and a moderate level of attention is paid to a breakeven target.

There is another influencer in our approach to fees; we (Seed Commission and administration) look across all programs of the department to seek out the bottom line for the agency. This "big picture" approach is a real benefit to our growers and customers; as long as the budget picture is sound, we don't overreact to the up-and-down nature of acreages, test requests or other service areas. We've been fortunate over the past

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decade as certification acres have been generally strong, and lab sample/test numbers are decent. Revenues from seed sales and licensing fees that fund regulatory activities are also strong due to a healthy seed industry in the state.

This information is relevant for one reason; we've been able to avoid fee increases in both Field Crop and Potato certification programs for over ten years. Our standard practice is to review and adjust laboratory fees every 2-3 years, and do the same with field inspection, final certification, potato shipping point and seed tax fees every 5-7 years. The impact on producers is a major consideration; the internal review includes cost comparative information from regional certification providers and laboratories, ensuring that our services are competitively priced.

The point? We intend to perform an overdue review of fees department-wide during the coming fiscal year. The internal analysis is complete, and laboratory fee recommendations will be reviewed by the Seed Commission in March. Field Seed and Potato Program fees will be reviewed and acted upon in the next six months, with probable implementation in spring of 2018.

This article is one of many ways to provide notification to our customers. We will be visiting further with our grower groups over the coming year regarding any action on fees. This article may not be justification, but it does serve as an up-front explanation of the fee review and increase process used here.

Best wishes for a safe and profitable spring season,



Company Fined for Seed Law Violations

Steve Sebesta, Deputy Commissioner

The North Dakota State Seed Department recently settled a case concerning state and federal seed law violations against a North Dakota seed producer for an illegal sale of a protected variety in 2016.

The company was fined \$11,000 for illegally selling 956 bushels of Gold ND flax, a North Dakota State University release. The variety is protected under the Plant Variety Protection Act (PVPA) and Title V of the Federal Seed Act.

Under the PVPA, the variety owner has exclusive rights to determine who may produce and market seed of its protected varieties. Title V prohibits the sale of seed that is not certified by an official seed certifying agency if the variety owner has specified seed be sold only as a class of certified seed. The Gold ND flax seed in this case had been field-inspected by the State Seed Department, but final certification had not been completed, therefore, the seed was not legal for sale. Several North Dakota seed laws, principally labeling requirements, were also violated.

The State Seed Department is responsible for the enforcement of seed laws in North Dakota and regards these violations as very serious. State and federal seed laws were established to protect consumers and provide for the standardization of testing and labeling requirements and to protect the intellectual property rights of variety owners. Illegal seed sales are detrimental to the state's seed industry and the hundreds of legitimate seed producers, conditioners and retailers.



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

Vigilance Key to Palmer Amaranth Control

Steve Sebesta, Deputy Commissioner

Palmer amaranth (*Amaranthus palmeri*) is an invasive weed species that has been detected in neighboring states but not in North Dakota yet. Palmer amaranth is a serious threat due to its rapid growth rate, prolific seed production and ability to develop resistance to herbicides. Some populations have developed resistance to multiple herbicide modes of action making chemical control difficult. Palmer amaranth is a dioecious species and female plants commonly produce more than 250,000 seeds and some scientists have estimated seed production up to one million seeds per female plant. Seeds exhibit significant dormancy which further complicates chemical control and extends the seedbank in the soil.

While plants may be distinguished from other Amaranth species present in North Dakota based on a few plant characteristics, there are no distinguishing characteristics in seed, which makes visual identification of Palmer amaranth in a seed sample impossible at this time. Citing this problem, the Association of Official Seed Analysts directed member labs to include a disclaimer when issuing analysis reports for seed lots found to contain Amaranth species.

The presence of Palmer amaranth was confirmed in Iowa in 2013 but based on the level of infestation an ISU Extension Weed Specialist suspects it had been introduced several years earlier. South Dakota also confirmed its presence in 2013 and this year officials in Minnesota found Palmer amaranth in first-year conservation plantings at thirteen sites in two counties.

Several other methods of introduction and spread are possible including contaminated animal feed and subsequent spread of manure, wildlife, wind, floodwater, farm machinery including custom combiners, birdseed, wildlife plot seed and hay. Regardless of method of introduction, the potential threat of Palmer amaranth has raised awareness in the agricultural community in North Dakota with reason. Palmer amaranth is a very competitive and aggressive weed and significant yield losses of nearly 80% in soybean and 90% in corn have been reported in Illinois.

Limiting the introduction and spread of Palmer amaranth will require the efforts of numerous state agencies including the North Dakota Department of Agriculture, the State Seed Department, NDSU Department of Plant Sciences, NDSU Extension Service, county weed control officials, as well as seed producers and retailers, crop scouts and farmers.

Understanding the seriousness of this weed and the challenges it presents from different sources of introduction, the difficulty in identification and lack of adequate control measures, the North Dakota State Seed Department has developed an action plan involving three department programs; Field Seed, Lab Testing and Regulatory. Each program area has identified and initiated several measures to address the problem for the near term in hopes of mitigating the seriousness.

A genetic test to identify Palmer amaranth seed has been developed but at this time we believe that the cost is prohibitive for the department to implement. This test evaluates individual seed but is only effective for those seed tested as it does not detect the presence of Palmer amaranth seed in a bulk sample. An alternative method, which may be more economical, is in development but refinements are expected allowing a larger sample. Reliability of growout test using seedling characteristics to distinguish species has limitations because of poor germination of Amaranth seed due to high seed dormancy and the length of time to obtain results.

The Field Seed team will be especially aware of Palmer amaranth this summer during field inspections but seed growers should not rely on inspectors to identify it since it may not be evident during the time the majority of our inspections are conducted. The Seed Department strongly encourages seed growers and farmers to learn more about Palmer amaranth, inspect their own fields and take remedial action if found.

In the Seed Lab

Jeanna Mueller, Seed Lab Manager

In a typical year, we are about a month away from planting. In the seed lab we are diligently working on samples coming in at a steady pace, but are waiting for the big push of samples. We are noticing quite a few carryover samples being tested for recertification. This is good. It is so important to get seed tested to ensure quality and vigor. Germination can change quickly on low quality seed.

A question about cover crops and labeling came up the other day when visiting with a custom seeder. The question leads the way for some clarification about ND seed laws. In North Dakota, all seed sold for use as a cover crop must be labeled according to state seed laws. The label must include seed purity, germination, noxious weed seed amounts and name of the seed variety. If a farmer wishes to use his own seed as a fallow cover crop, he is under no restrictions. Seed that is protected by PVP requirements may not be sold or moved to another party without the approval of the variety owner. If the seed is being sold as a cover crop mixture or blend it must have components tested, listed and labeled correctly.

Reasons for labeling:

- To stop the spread of state noxious weeds or potential other crop contamination
- To ensure germination is up to date
- To protect the variety owner

Reminders:

The amounts of seed needed for testing procedures varies on the type of test. To ensure that your samples are being processed in a timely manner, please send in the correct amount of seed. For a germination test, we ask for about 800 seeds. If you are thinking about adding purity test after the germination test are out, please send about a pound and a half for small grains and soybeans. Please see ND State Seed website for specific tests.

Annual Meeting:

The 2017 annual meeting for seed analysts will take place in Denver, CO on June 19-22. This will be a great opportunity for networking and collaboration as we will be meeting in conjunction with the International Seed Testing Association. This will be the first time that AOSA, SCST and ISTA hold a joint annual meeting. We are hopeful that this meeting will foster an even stronger relationship between ISTA and AOSA/SCST members, and improve seed science by creating an environment where networking, productive brainstorming and idea-sharing can occur.

Field Inspection Tips

Joe Magnusson, Field Seed Program Manager

A successful certified seed grower plans ahead before any seed goes into the soil. Here are a few reminders to help growers.

Plant on eligible ground

Seed fields cannot be planted on the same crop the previous year unless the same variety was planted and the field was inspected for certification. Durum has an additional restriction which requires Foundation class seed be planted on ground that did not have spring wheat the previous two years. If you plant Registered durum seed, one year out of spring wheat is all that is required. The one year requirement is allowable but we recommend durum not to be planted on spring wheat ground for several years as we have seen wheat carryover and volunteer in some fields for up to five years.

Apply for field inspection

If you planted or intend to plant Foundation or Registered seed, we strongly encourage you to apply for field inspection. Every year we receive calls from growers who failed to apply for eligible fields (Foundation or Registered seed planted) and want us to certify their seed, even though they did not have their field inspected. If you don't apply you can't certify and you will miss out on an opportunity to sell your field inspected seed for a premium price. Complete the application and submit by June 15 and enclose a copy of the proof of seed eligibility (bulk certificate or tag), FSA map of the field to be inspected, and the proper fee. Applications can be obtained on our website, ndseed.com, your local county agent or by calling the department.

Isolation required

A minimum 5 foot isolation strip is required between inseparable crops and varieties of the same crop. Isolation can be achieved by mowing, cultivating, or leaving a bare strip at planting time. A field will be rejected if isolation is not in place at the time of inspection. Once the isolation strip is in place the grower may call for a re-inspection, which will incur an additional inspection fee. A natural barrier such as a ditch, fencerow or roadway or a separable crop adjacent to your field will be considered proper isolation.

Weeds of concern

Field bindweed is the most common weed resulting in a failed inspection. It's a prohibited weed and difficult to remove from small grains due to similar size and weight. Field bindweed is generally found along ditches, fences, tree rows, hill tops, old farm sites and rock piles. Be sure to control this weed before the inspector arrives to ensure your field will pass inspection.

Thistles are also a concern in field peas and crops of similar size. Even though seed may not be viable in these weeds, it is difficult to condition the seed heads from the crop being inspected. Inspectors will reject all areas found with patches of thistle and require you to avoid these areas at harvest. Selling seed with thistle heads will adversely affect your business in the future.

Rogue lentils or common vetch has become a concern in lentil seed production. When monitoring your fields watch for plants that are larger, more prolific, with purple flowers and pods that are more similar to field peas. It only takes 0.5% of this weed seed to reduce the grade of lentils below # 1. Remove these from your seed fields.

Field Inspection Tips continued on page 5



Left: Lentil seed (*Lens culinaris*); Right: Common vetch seed (*Vicia sativa*)

Certified Seed Reduces Impact of Vetch in Lentil

Steve Sebesta, Deputy Commissioner

North Dakota leads the nation in lentil production but in the last several years common vetch (*Vicia sativa*) has become a problem for some lentil producers. Common vetch is an annual legume with morphology similar to cultivated lentil, prompting some to call it rogue lentil when found in lentil fields. It can be introduced or spread by seed. The North Dakota State Seed Department strongly encourages lentil producers to plant certified seed to control this weed and minimize economic losses.

According to Dr. Bob Price from the California Department of Food and Agriculture, lentil seed mimicry in *Vicia sativa* is a widely reported phenomenon in Europe and Asia. Rogue lentils observed here are probably a weedy relative and not the cultivated form.

Common vetch plants are larger, taller and more vigorous than lentils. Leaves of both plants are shaped similarly but common vetch leaves are usually larger. Flowers are more conspicuous and purple and produce seed pods which are larger than lentil, more similar to those of a pea. Seeds are similar in shape and size to lentil which makes separation during conditioning a challenge. Seeds are often darker brown and have a blockier appearance compared to the lens-shaped seed of lentils.

Due to the similarity in seed characteristics, common vetch seed in lentil is classified as inconspicuous admixture during grading which, if present at a high enough level, will result in a lower grade, and impact market acceptance and price. The limit for U.S. Grade 1 is 0.5%. We have heard of significant levels of contamination in lentil loads last year, some exceeding five percent.

The department has received one common lentil sample so far this season that contained a significant level of common vetch seed. No certified seed samples tested thus far have contained any common vetch.

There are several best practices the department recommends to lentil producers to limit the introduction of common vetch in their fields.

1. Plant certified seed. Since common vetch can be introduced through contaminated seed sources, producers are encouraged to purchase certified seed from a reputable seed

supplier every year. Due to the similarity in plant and seed characteristics, lentil producers may be unaware they have a contamination issue on their own farm. Consequently, farmer saved seed and common seed may contribute to the problem. Seed certification utilizes field inspection by qualified inspectors as well as laboratory testing to ensure the seed meets minimum standards for varietal identity, purity, germination, and the absence of seed-borne diseases such as *Ascochyta*. Certified seed is the best tool producers have to ensure high quality seed.

2. Test saved seed. The Seed Department highly recommends that any lentil seed saved for the purpose of replanting be tested for purity as well as germination and *Ascochyta* to determine the suitability for seeding purposes. Submit samples to the Seed Department for testing.

3. Insist on legal seed. According to state seed law, all agricultural seed sold in North Dakota, regardless of whether it is certified or common, must be properly labeled. Since common vetch is not a noxious weed, it does not need to be identified by name on a label. However, consumers have a right to ask for an analysis report for a seed lot which identifies each species found in a sample of seed.

Lentil producers are fortunate to have in their toolbox an easy solution to the common vetch problem to help protect the marketability and profit potential of their crop. Purchase certified seed from a reputable seed supplier to ensure the best possible quality.

For a list of field inspected lentil varieties eligible for final certification check Bulletin 92, 2017 North Dakota Field Seed Directory, or go to www.ndseed.com and click on Field Seed Directory, or check the 2017 Seed Guide.



Field Inspection Tips continued from page 4

Palmer amaranth is a prolific weed that has been found in neighboring states. During inspection or harvest of early crops and small grains, this weed will probably not be identified as it resembles other pigweed species. But during later inspections such as soybeans, it may be identifiable. It should be eradicated if found. Specific areas of concern are pollinator plantings, CRP mixes, hay and feed from sources of known Palmer infestation. Waterfowl and custom harvesters/planters are other sources of introduction. If you have had custom harvesters that have been in states known to have Palmer, you should check your fields this year. If you suspect you have this weed in your fields, call your extension agent so they can confirm its identity.

Harvest

It is the seed grower's responsibility to ensure each seed field has been inspected and passed before harvest. Do not harvest a field if you are unsure. Call your inspector or the department to confirm the status. Review the field inspection report for any corrections or areas to be avoided during harvest. If you utilize custom harvesters, make sure their combines are clean before they enter your certified field.

Seed Regulatory Report

Jason Goltz, Regulatory Manager

Seed retail facilities that usually market common seed have shown interest in diversifying their business by selling certified seed. This is good news to the certified seed industry as it is an indication of more interest from the consumer. One problem with this is that facility managers are not always aware of the differences between selling common and certified seed.

In order to handle and sell certified seed, retailers must be inspected and approved by the North Dakota State Seed Department. Bulk retailers of certified seed must meet certain minimum requirements for equipment and management practices. These requirements ensure compliance with state seed certification regulations, state seed laws and the Federal Seed Act.

Last year, a regulatory inspector found a non-approved facility attempting to sell certified seed. This facility had previously sold common soybean and decided to begin selling certified wheat. The manager simply did not know about the additional requirements. Bulk certificates had been issued, but management did not know what to do with them. Luckily, no seed had been sold by the time the inspector arrived. Through some educational efforts on the part of the inspector and NDSSD, the facility was able to be brought into compliance.

At the beginning of the current regulatory season this year, nine more facilities were found in the same manner. It was the same story as the year before; certified wheat offered for sale at facilities previously selling common seed. Bulk certificates had been issued, but the facilities had printed their own version of a tag. Again, no seed had sold and through the efforts of NDSSD these facilities were brought into compliance. Our regulatory program would prefer to bring a facility into compliance through education rather than penalization. Since these issues were found before the seed was sold, we did not issue fines. It would have been a much different story if a sale had occurred.

Before selling certified seed to someone who intends to resell that seed, it would be wise to ask some questions. Simply asking if they have been approved by the State Seed Department would be sufficient. Although we send out inspectors each year and engage in education throughout the year, we all have an interest in the integrity of the certified seed industry. If you know of illegal seed sales in North Dakota, call the department. We will always follow-up on a complaint.

Today, more people are looking to diversify their operation. Some are moving to other commodities, others are interested in trying cover cropping. Whatever the reason for this change, the seed industry will meet the demand. This increase in demand for certified seed is causing more facilities to market other crops such as small grains or peas. Since many of these other crops are protected under federal PVPA laws, we can only expect these issues to happen every year. Do your part to help protect your industry, as all it will take is to ask a few questions.

Reminder...

It is the seller's responsibility to provide the purchaser a bulk certificate for each load of bulk seed at the time of delivery.

North Dakota State Seed Department

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P.O. Box 5257
Fargo, ND 58105-5257

Non-Profit Organization
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Permit No. 433

ADDRESS SERVICE REQUESTED

NDSSD Calendar

- May 1** Applications due for grass seed inspections
- May 29** Memorial Day, office closed
- June 15** Applications due for all crops including potato (except buckwheat, millet, & soybean requiring a single inspection)
- July 4** Independence Day, office closed
- July 15** Applications due for buckwheat and millet
- Aug 1** Applications due for soybean requiring one inspection
- Sept 1** Reports due: Annual Report of Agricultural & Vegetable Seed Sold (labeling fees), Variety Development & Research Fees; Carryover Seed; Applications due: Approved Conditioner & Bulk Retail Facilities