UMN Forever Green Partnership

Kernza® Mycotoxin Testing Protocol for MN Kernza Growers

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Introduction

This document lays out the recommended standard protocol for MN Kernza® growers to take samples of harvested lots and test for mycotoxins (DON and aflatoxin). The benefits of using a standardized process include growers having a common roadmap, getting a lower cost per test for bundling services, knowing growers are comparing apples-to-apples, and developing some expertise in Kernza testing at local MN grain testing labs.

Taking multiple samples from each lot is valuable at this time given Kernza's early stage of commercialization. Each lot will need to be tested for DON, aflatoxin, and moisture to enter food-grade markets. Any lot entering the seed supply will need to be tested for purity, germination, and weeds. Lots may need to be tested for dockage and cleanout. Additional samples may be valuable as growers, researchers, and industry assess optimal harvest and post-harvest management practices, shelf life, and more.

Recommended protocol for sampling

- Every commercially-eligible Kernza lot needs to have at least three (3) separate representative samples taken of at least 100 grams per sample- i.e. a medium sized paper or plastic bag or equivalent volume each
- One sample will be sent to the lab for testing, one will be retained for testing dockage and cleanout if necessary, at least one will be held in case any further analysis is needed
- The grower name, field location, harvest date, harvest method, Kernza variety, and grower contact info (phone and email) should be written on each bag
- If available, use sample bags provided by the partner lab. Complete the information on the bag label and fill the bag to the indicated "fill line."

Recommended testing partner, costs, UMN support available

- **After vetting several labs, we recommend Dairyland Laboratories (919 Lincoln Ave, Sauk Rapids, MN 56379) as the default lab for Kernza mycotoxin testing in MN**

Please direct any questions to Colin Cureton, UMN Supply Chain Development Specialist, at cure0012@umn.edu or call/text at 612-750-4967

- Total cost on each sample to assess DON, aflatoxin, and moisture will be $65.60, which includes an 18% discount for buying tests in bulk and using centralized billing
- **To streamline the process, get savings for buying bulk, and to continue mitigating risk, UMN can pay for testing MN Kernza lots at Dairyland**
- Growers are of course free to work with another lab if they choose, but UMN will not cover testing costs

Additional details

- Dairyland will use the ELISA method for testing. HPLC/LC-MS are seen as the more rigorous "gold standard" by industry but that doesn't apply at the moment since no HPLC/LS-MS methods or other mycotesting methods are yet validated for Kernza. UMN and TLI are working on getting validated methods
- Tests could take anywhere from 2-7 days in the lab
- These tests are technically quicker to run but most labs run these tests in batches, so if they receive a lot of samples in rapid succession test results may come back quicker. If samples trickle in slowly, getting results will take longer.

Protocol for testing prior to co-mingling grain

- **The default plan should be to store lots separately, but commingling may be necessary in some situations**
- **Prior to any commingling, we strongly recommend MN growers send samples for same-day or <24 hour DON and aflatoxin tests with State Grain Inspectors, or SGI.** Samples can be mailed or taken to (12100 Yosemite Ave, Savage, MN 55378)
- SGI uses ROSA (Rapid One Step Assay) lateral flow strip tests, which are currently less common by industry standards but can give us a quantitative read on mycotoxin levels
- The cost for rapid DON and afla- tests is $31 each, so $62 per sample total
- Since these will be one-off tests as needed, and there is no discount for bulk/centralized billing, growers will be responsible for the costs of any rapid tests. Again, UMN will not assume these testing costs.
- After any co-mingling, you'll want to send a sample of the final commingled material to Dairyland to get a result on the combined material, and UMN can pay for that.

NOTE: Mycotoxin testing and moisture

Note that as wet grain dries, the concentration of any mycotoxin present is likely to increase. There is also potential for mycotoxin levels to increase after harvest during storage. Therefore, **any grain sent in out of the combine or field for testing at high moisture content may need to be re-tested once it reaches a stable target moisture (12%).**

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