

GROWMARK FS Seedlings



Volume 3 • Fall 2007

Rumenations

By Ron Wilston, Dairy Nutrition Seed Specialist

The Buzz about Mycotoxins

There seems to be a new buzz about mycotoxins. Publications and conferences alike are filled with articles and featuring speakers on the subject. But why the new buzz? Are we as an industry more aware of them than in the past? Are they more of a problem now because high producing dairy cows, swine, and poultry can't handle the additional stress from them? Are changes in our cultural practices favoring the molds that produce mycotoxins? What can be done to help control mycotoxins? These are just a few of the many questions concerning mycotoxins. And unfortunately, there are many more questions, but let's discuss the work that is being done to help limit the effect of mycotoxins both nutritionally and agronomically.

My involvement with mycotoxins started a number of years ago as a dairy nutritionist. In that role, my concern was how to control mycotoxins once they were in the feed stuffs. In my current role with GROWMARK FS, my goal is to figure out what causes the conditions for the molds that produce mycotoxins to grow and what can be done to control these molds before they get into your on farm feed stuffs.

First, let's start off with a simple definition of mycotoxins and a little about them. The word mycotoxin comes from the greek root word myco which simply means "mold" and toxin meaning "poison". If you think of the mold as being the snake and the mycotoxin being the venom, mycotoxins can be easier to understand. There are many different kinds of snakes, but not all snakes are

venomous. In the same way, while there are many different kinds of molds, not all molds produce mycotoxins. Another comparison is the snake must be present to have venom. Likewise, molds have to be present at some point to have mycotoxins. Different poisonous snakes produce different kinds of venom, the same as different molds produce different mycotoxins. And finally, if you cut off the head off of a snake after it has released its venom (bit you), the venom is still poisonous. Similarly, if you kill the mold that already produced mycotoxins, the mycotoxins will still be viable. This is part of the reason that mycotoxins are hard to battle.

Another reason is that mycotoxins are very heat and digestive resistant making the only forms of control once in storage: omission, dilution, or mycotoxin binders and yeast additives. Mycotoxins can not become resistant to binders because they are not living organisms that can change their structure to adapt and become resistant (remember, they are the venom from a living organism). Binders work on electrical charge attracting mycotoxin molecules to them, while yeast type mycotoxin additives work to bolster the immune system of the animals.

But what can we do agronomically to help with the problem? To answer that question, GROWMARK FS set up multiple on-farm research studies in New York and Illinois early last spring to look into some of the issues surrounding the molds that produce mycotoxins. The trials were designed to see if:

- 1) Genetic resistance to molds (specifically fusarium graminearum) exists in corn like it does in wheat.

- 2) Does manganese play a role in protecting the plant against mold invasion (again specifically looking at fusarium graminearum)?
- 3) Is there a difference in which manganese products work the best (foliar vs. seed applied)?
- 4) Does glyphosate tie up manganese in the soil?

The protocol of these tests included leaf tissue analysis to check for manganese uptake by the plant five days after spraying the plants with one of three different manganese products, glyphosate, or glyphosate plus manganese. These were compared to the control which received no treatments. Another protocol was to score the different treatments to tell whether they had any effect on mold production in the ears. This was done by analyzing ear samples from each treatment group.

The results of the leaf tissue analysis showed that all of manganese products performed well when sprayed alone and with glyphosate. None of the products showed any conclusive advantages over any of their counter parts. That being said, the seed applied treatment did have an ease of use advantage and from the results gathered was as effective as the foliar applications in terms of the plants ability to mobilize the manganese. The glyphosate only strips did appear to tie up manganese in corn in these field trials. In fact, the leaf tissue analysis showed that the plants receiving only glyphosate had lower tissue concentrations of manganese than the control.

The results of the ear scoring for mold were less conclusive in the New York

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Seedlings

Rumenations continued...

trials. We found no fusarium mold which is what was anticipated, but we did find a lot of bird and insect (mainly corn root worm beetle) damage that was the path way for the development of penicillium mold. This mold, grayish green in color, can produce its own mycotoxins – mainly ochratoxin. Without the fusarium present, we were unable to determine if manganese applications play a role in the plant against mold invasion. Our plans are to continue the study to find out.

To screen for genetic resistance differences among hybrids, we contracted with experts at the University of Illinois to inoculate hybrids with specific molds and determine the resistance levels. These results were more encouraging. They did find different resistance levels to mold, specifically fusarium graminearum, among the FS hybrids tested. This research will continue, to determine if product rankings can be created to help in product selection based on the resistance level of hybrids to molds that produce mycotoxins.

So what does all of this mean from a producers perspective? It means that while we have more questions to answer there are agronomic options that will help limit your risks from mycotoxins. These include:

1) **Soil fertility:** Make sure that you corn plants have all the nutrition they need to keep them healthy and as stress free as possible. Pay particular attention to manganese levels especially on well drained, high organic matter, high pH soils. Nitrogen and potassium levels have been correlated to increased stalk rots. Both high and low levels of N and low levels of K can be a problem. Stalks rots may predispose a plant to mold invasion and ultimately to mycotoxins if conditions

are right. Keep in mind that soil samples only tell you what nutrients are in the soil and not how available that nutrient is to the plant.

- 2) **Tillage practices:** Traditional plow and disk appears to control molds the best since the residue that harbors the mold spores gets buried. But, given environment and economic factors, that practice may not be a viable option. No-till or Zone till appears to be a better control than chisel plowing because it doesn't disturb the residue as much, allowing it to be dried out and sterilized by the sun's rays. Molds don't tolerate ultraviolet light very well which is why you see them growing in dark humid conditions. Chisel plowing incorporates the residue into the soil providing the moisture and shade needed for mold spores to grow.
- 3) **Hybrid selection:** Remember, there does appear to be different levels of resistance to specific molds between hybrids. Assuming the repeatability of the genetic resistance screenings, corn hybrid rankings for resistance should be forthcoming from GROWMARK FS within a few years. Another hybrid trait that does appear to have merit in terms of potentially reducing mycotoxin risk is European corn borer (ECB) resistant corn. ECB resistant corn, by killing the European corn borer moths that bore holes in the plant, prevent some specific types of molds from gaining entry into the plant. However, not all molds enter the plant through damaged areas, (some enter through the silks at flowering) so ECB corn hybrids will only reduce your risk from certain types of mycotoxin producing molds.
- 4) **Planting:** Plant as early as conditions will allow to get corn to

pollinate earlier to try to avoid the mold spores that will enter through the silks.

- 5) **Scouting:** Scout fields ten days to two weeks after corn plants pollinate to look for signs of red or pinkish mold. The red and pinkish mold is *Fusarium graminearum* or gibberella as it's called in that stage, and will typically start to appear at this time. Once corn starts the dough stage other molds may appear especially if there is corn root worm beetle and/or bird damage. Penicillium mold may form in ears that have been damaged if climatic conditions are right.
- 6) **Spraying:** Some fungicides may help to control certain families of mold. The tough part is applying the fungicides late enough in the season, to control the molds that come in to the crop so late. Air application may be the only feasible solution. More research needs to be done in this area before solid recommendations can be made. To our knowledge, there currently are not any products labeled to control these molds.
- 7) **Harvest:** Harvest at the correct moisture and maturity to avoid prolonged exposure to mold spores and conditions that may favor mold growth. If corn is harvested for silage, get it into storage as fast as possible – avoid leaving silage in a wagon or truck over night. Getting silage into storage quickly and packing to a density of fifteen pounds per cubic foot will force the oxygen out and stop the growth of mold spores. The use of good quality silage inoculants like Biomax 5 will speed up fermentation process and use up the oxygen necessary for mold growth. For dry grain get it below 15% quickly because mold spores need moisture levels of

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What's new and exciting in the FS Corn lineup?

By Shaun Heinbaugh, Research Supervisor – GROWMARK FS

Most of the corn is in the bin and it's time to reflect on what worked and what didn't work and to prepare for next season.

My job, compared to most farmers, is very simple because I focus mainly on one thing, hybrid selection. Part of my responsibility is to identify new and better hybrids for your farm. The other, perhaps more important part is to share that information and prepare you to make the best decision on your hybrid selection.

The process involves sorting through thousands of new genetic combinations each year to identify an elite group of promising experimental hybrids adapted to our growing conditions in the Northeast. We evaluate these hybrids at over 60 research trial locations scattered from northern New York to western Pennsylvania to the eastern shore of Maryland. As you would imagine, we get a broad look at a hybrid's performance across many soil conditions, farm practices, and stress factors for both silage and grain. These large scale on-farm evaluations allow us to determine what works best and to weed out what doesn't.

It's important to understand that each hybrid has a specific personality or comfort zone that it's best suited for. This is no different than sister Sue that handles the cows because she doesn't like field work and brother Bill that handles the crops because he doesn't enjoy cows. They're good at their jobs and perform well in their comfort zone. In some cases there are hybrids with a larger comfort zone, just like Dad, who could do a good job of handling both the crops and the cows.

Understanding a hybrid's personality and utilizing trait technology are both equally important for success. The addition of YieldGard VT Triple technology into several FS hybrids has really proven itself in our field trials this year. This second generation of YieldGard technology has enhanced the barrier against rootworms while maintaining first-rate corn borer control and from what I've seen, improved the consistency of a hybrid under stress conditions.

However, relying solely on traits or hybrid genetics can limit yield potential if one or the other is not suited for the

intended conditions. My advice is to look at the specific field situation and match the hybrid's personality with the goals of the operation. Then decide which trait package is best for protecting the yield. Don't overcomplicate things!

In my travels, I often hear "Why did you get rid of (fill in hybrid)? That one worked great on my ground." The short answer is that over the years, hybrids will come and go and are replaced with better hybrids. Our research database with historical data definitely proves that. Statewide and national averages also prove that on a larger scale. **Have confidence that a better hybrid exists, and know that it's our job to identify and place it properly.**

As you look at the new seed catalog and see new hybrid numbers, you might feel overwhelmed or find yourself guessing what to select. Don't do that! Most of the guesswork is already done. I've prepared a cheat sheet with several key grain hybrid personality profiles across maturities. These are some of my favorite hybrids based on observations and yield data collected from our field trials. Enjoy!

Hybrid: FS 3968VT3

Relative Maturity: 89 Day

First Choice: Grain

- Early Season Habit: Grows fast and furious in early spring, dark green, no-till candidate.
- Plant Type: Med tall in NY, slightly shorter in PA. Strong stalks.
- Ear Type: Long ear with smaller cob type, med flex, excellent test weight
- Personality: Widely adapted. Performs well from gravelly to deeper soils of NY to short season grain environments in PA. Loose husk type for fast grain drydown and early grain setup.
- Note: Triple stacked VT3 package available.

Hybrid: FS 4465VT3

Relative Maturity: 94 Day

First Choice: Grain

- Early Season Habit: Dark green, fast emergence, good cold tolerance, no-till candidate.
- Plant Type: Med tall in NY, slightly shorter in PA. Strong stalks with showy bright fall appearance
- Ear Type: Large, girthy ear type with above average flex. Especially clean, bright grain.
- Personality: Performs well in short season grain environments from Northern to Southern PA and short season grain environments in NY.
- Note: Same genetics also available in 4464 (YGCB) & 4464XRR (YGCB/XRR)

Hybrid: FS 5565GT

Relative Maturity: 105 Day

Dual Purpose

- Early Season Habit: Tall /upright in early spring, dark green, strong vigor, no-till candidate
- Plant Type: Med tall in Central PA and south. Gets taller in Northern PA & New York. Strong stalks. Med tall ear set.
- Ear Type: Large girthy ear with high ear flex, med dry down
- Personality: Widely adapted across soil types. Huge grain and silage yields across Central, Northwestern, Southwestern PA on dairy and grain operations. Great drought tolerance. Traits or no traits, it's hard to ignore the numbers on this one!
- Note: Same genetics also available in 5565IMI (imidazolinone tolerant). IMI and Glyphosate tolerance not in the same hybrid. No refuge needed for this one. We're exploring traited versions.

Hybrid: FS 6154VT3
Relative Maturity: 111 Day
First Choice: Grain

- Early Season Habit: Tall /upright in early spring, dark green, strong vigor, no-till candidate.
- Plant Type: Med tall in Southern PA and Southward, gets big and busty up in North Country, or with high fertility. Strong stalks regardless. Tall ear set.
- Ear Type: Long girthy ear with med high ear flex, fast dry down for maturity. Excellent grain quality. Not unusual to have test wt +60 lbs.
- Personality: Performs well on shallower soils across Southwest, Southcentral, and Southeastern PA and on heavier soils across the Eastern Shore. Great tonnage for silage with above average digestibility. Improved stalk quality over 6103 family.
- Note: Same genetics also available in 6052 (conventional), 6052XRR (XRR), 6153 (YGCB) & 6153XRR (YGCB/XRR)

Hybrid: FS 6363XRR
Relative Maturity: 113 Day
First Choice: Grain

- Early Season Habit: Shorter, pale look in tilled or no-till ground. Don't worry, color means nothing in the end.
- Plant Type: Distantly related to 6241VT3, slightly taller. Taller ear set. Robust plant, strong stalks. Great disease resistance, esp. gray leaf spot. Great plant health. Better choice for silage than 6241VT3.
- Ear Type: Long ear with med ear flex, med dry down. Excellent grain quality with great test wt.
- Personality: Another rugged hybrid with outstanding yield potential. Suited for all of Southern and Eastern PA into New Jersey. Improved stalk quality over 6407 family with better grain quality and yield stability.
- Note: Handles shaley and manured ground quite well. Underutilized as a dual purpose hybrid.

Hybrid: FS 6474XRR
Relative Maturity: 114 Day
First Choice: Grain

- Early Season Habit: Stays short and compact, fine for tilled or no till ground.
- Plant Type: The shortest, most stout plant type in this maturity range. Generally lighter green color. Low ear set. Some like this style for ear picking.
- Ear Type: Heavy fat ear with med ear flex, fast dry down. Consistent ear size with good tip fill. Excellent grain quality with great test wt.
- Personality: Works well where there is a history of stalk lodging problems. Handles drought stress well. Suited for Southern and Eastern PA down to the heavier soils of Eastern Shore.
- Note: Not a silage hybrid. Same genetics also available in 6372XRR (XRR).

Hybrid: FS 6241VT3
Relative Maturity: 112 Day
First Choice: Grain

- Early Season Habit: Shorter, pale look in tilled or no-till ground. Don't worry, color means nothing in the end.
- Plant Type: Med tall, med tall ear set. Very robust plant, heavy, strong stalks. Great disease resistance, esp. gray leaf spot. Plant stays greener longer while grain dries down.
- Ear Type: Longer ear with med ear flex, med dry down. Excellent grain quality with superior test wt.
- Personality: A seriously rugged hybrid with outstanding yield potential. Performs well in almost any soil condition. Excels with or without stress. Kicks into an even higher gear with high input management. Suited for all of Southern and Eastern PA into New Jersey. Endures stress on the lighter soils of the Eastern Shore.
- Note: Processor preferred for ethanol. Get it while we have it!

Special Thank You!

I had the opportunity to spend three days at the Ag Progress Days show at Penn State. It's been commonplace for years to hear how well our silage products perform, but this year I heard as many or more compliments from serious grain growers, big and small, about our grain packages. The positive feedback about our hybrids and our FS Crop Specialists was tremendous at the show! Thank you to all of the customers, and plot cooperators for your loyalty, patience, and hard work and for making my job enjoyable!

Shaun

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When you purchase seed from your local GROWMARK FS, you win with seed that delivers the latest technology, proven performance and superior profitability. With hundreds of test plots, we manage one of the widest-ranging test programs in the industry. It's the data from this comprehensive program that demonstrates how well our seed works in your local environment, under your local conditions.

You also win with year round support from your local GROWMARK FS Crop Specialist and the entire GROWMARK FS Agronomy Team, working hand in hand with you to help optimize your growing conditions and seed performance. No one in the industry offers you more comprehensive, agronomic, economic and environmentally sound advice, backed by a team of specialists including custom applicators, precision farming experts and crop scouts.

So enter today and you could win twice – once when you purchase your seed from GROWMARK FS and once with a great John Deere Gator HPX 4x4 utility vehicle!



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Technology in the Field helps with FS Silage Research

By David Roy, Research Supervisor – GROWMARK FS

Rumenations continued...

higher than 15% to grow. Harvest the grain as soon as possible because the quality will drop the longer it is in the field. Never let grain stand in the field over winter and harvest in the spring. In Russia, under the commune system, this was a fairly common practice that resulted in a lot of sick people from mycotoxins in the 1940s. A lot of what we know about mycotoxins today came from these wide spread infections in Russia.

- 8) **Rotation:** A rotation from conventional corn, to round up ready corn, to Bt corn isn't a true rotation. Continuous corn will constantly harbor spores that can cause outbreaks of molds the following year. Wheat, also a host to the same mycotoxin producing molds, isn't a good follow up crop to corn. In the Cornell University soft winter wheat trials the resistance levels range from 4% - 70% susceptible. If you are going to follow corn with wheat choose wheat varieties that are highly resistant to fusarium head scab. If you considering wheat only as a cover crop, rye is a better choice since it is very resistant to Fusarium.

There is a lot of work to be done to fully understand mycotoxins. Hopefully, this information has given you insight into mycotoxins and new ideas to help combat them. This research project will continue and we expect to be able to provide more answers as we learn more. GROWMARK FS is committed to discovering solutions to help solve problems affecting our customers – matching the right product to the right acre to help you achieve a higher level of productivity.

Ron

This year had to be one of the earliest and quickest silage harvesting seasons in awhile. In late July we thought that silage harvest was bound to start earlier than normal due to earlier planting dates this spring as well as more heat units and drier weather throughout the growing season. It did, and getting research trials harvested at the optimal time kept us hopping.

Predicting when to harvest corn for silage isn't difficult; it just requires a little investment in time to monitor the crop. Most of us know what dry matter (DM) we ideally want to harvest at and are typically aiming at 32% to 35% dry matter depending on the variety and the storage structure.

In a regional hybrid testing program, harvesting at that optimal point is a little more difficult. In on farm silage research trials we are usually dealing with more than a dozen varieties in each field at about 30 locations across the Northeast.

In order to get meaningful results we try to keep the relative maturity spread down to about 5-6 days between the shortest and longest season variety in each plot. We also include a check variety (or tester) which allows us to more accurately track and adjust for field variation, compare hybrid performance relative to each other and have a benchmark to gauge maturity with. We try to harvest the plots when the check variety is as close to 32% dry matter as possible.

Determining when the check variety is at 32% dry matter from milk lines and "growing degree units" (GDU's) are approximations as best. Silage moisture probes have too much variation. Drying samples with a Koster tester or microwave has been about the only way to accurately determine DM in the field and on the farm. But this year, we had a new tool to try.

Through a grant from John Deere we were able to use a portable NIR (Near Infra Red) sensor to monitor dry matters in the field. This enabled us to take a forage sample and run 5 replications of that sample in about 5 minutes

compared to a Koster Tester which takes 30 to 45 minutes to run just one sample once. We were able to use it to estimate yields adjusted for dry matter while still at the farm. We are still using separate oven dried samples to determine DM in order to compare with the NIR values, but the new tester may be the wave of the future.

Even when you know exactly what the DM is, getting all the plots harvested in a timely manner can be difficult. Real world issues that affect harvest like: weather, machinery breakdowns and the grower's and our schedules, come into play. Consequently, there always seems to be a plot somewhere that just doesn't get harvested on time and if dry matters are pushing 40% or more, the nutritional data can become questionable at best and most likely not even useable.

This year we addressed this challenge a little differently by using a modified one-row John Deere chopper mounted on a small trailer to "sub-sample" a research trial if it didn't look like it would be harvested on time. This chopper quickly produced a nice, cleanly chopped sample similar to what would be going into the bunk. This enabled us to get nutritional information on the varieties in that trial as if it was harvested on time. The samples are immediately vacuum sealed in the field and allowed to ferment, just like a silo or bunk.

The combination of quick on the farm NIR testing for dry matter and the ease of sampling with the portable chopper has real potential to improve the quality of the nutritional data gathered from research trials. These improvements in accurately identifying when to harvest and being able to take control of when the samples are taken, aid us in identifying and selecting new silage varieties.

Dave

Seed Programs

By Ralph Horchler, Territory Sales Manager – GROWMARK FS

Wow, GROWMARK FS LLC. sure had a great year in 2007. With continued double digit growth in all of our seed lines, the superior performance of our FS brand is really leading the way. We are very appreciative of our customers and as a way to say thank you, we want to let you know we are giving away three John Deere Gators this winter for customers that order their seed needs from GROWMARK FS. Here are the details...

Place a seed order with your GROWMARK FS sales representative by 12/31/07 and you will receive a entry for a new JD HPX 4x4 Gator. Want to increase your chances? Here's how. Order 12 bags of corn over last years order; or 6 bags of alfalfa; or 50 bags of beans over last year's order and you will receive an additional entry, so the more you buy the better the chance of you winning! If you are a loyal seed customer and order 85% or more of your 2008 seed needs by 12/31/07 and you will receive 3 entries. It's our way of having a little fun and

giving you a chance to win twice- Once, when you order proven seed brands from GROWMARK FS and again when you win a Gator. We will draw the three winners on 2/1/08, so order early and get in on the fun!

We also offer a chance for you to combine all brands for larger quantity discount off your seed order. FS Corn, Dekalb, HiSOY beans, Asgrow beans, Schillinger beans and FS forage seeds and forage quality products can all be lumped together to get you the biggest discounts. And, if you pay by the dates below, you'll earn additional discounts for early payment.

11/21/2007	8.25%
12/21/2007	7.50%
1/25/2008	7.00%
2/25/2008	5.00%
3/25/2008	3.25%

For those of you that have never tried any seed from GROWMARK FS, consider giving us a chance to put out a side by side on your farm against your current

brands. We would love to prove to you how our products will perform on your farm, under your conditions. Ask you salesperson for more information on our side by side program.

I know the hectic fall season is upon you and the seed peddlers are on the go, but you owe it to yourself to talk with your GROWMARK FS sales representative today about the exciting things going on with the FS brand and our national brand partner Dekalb. With hundreds of test plots, we manage one of the widest-ranging test programs in the industry. It's the data from this comprehensive program that demonstrates how well our seed works under your local conditions. **It's GROWMARK FS that can sit down with you and your team and put together a whole farm agronomic program that fit's your operation, incorporating fertility, spray programs and the correct seed trait mix utilizing our high yielding seed varieties. We thank you for your business and look forward to another great year.**

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