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KOW Ruminations

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"If a liar and deceiver comes and says, 'I will prophecy for you plenty of wine and beer,' he would be just the prophet for this people!" –Micah 2:11

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Thomas DiLorenzo, in his book *How Capitalism Saved America*: A pure market entrepreneur or capitalist, succeeds financially by selling a newer, better, or less expensive product (or service) on the free market **without any government subsidies, direct or indirect**. The key to his success as a capitalist is his ability to please the consumer, for in a capitalist society the consumer ultimately calls the economic shots. By contrast, a **political** entrepreneur *succeeds primarily by influencing government to **subsidize** his business or industry or to enact **legislation** or **regulation** that harms his competitors.*

Preventing Mycotoxins Starts With Fall Tillage

Your politically incorrect guide to reducing mold in your feedstuffs, fungal disease in crops.

I'm an advocate for recycling...not necessarily the type that asks me to sort my paper and plastic, but rather of the school that considers it one of the fundamentals of soil fertility. *Farmers* throughout recorded history have been, more or less, the cultural *example of conservation and re-using of basic resources*. Farmers, historically, have needed to be *conservationists* simply for the reason of economic survival. *Wise* farmers find a way to use *things* (everything) to the *maximum* and then re-use it. Farmers, small businesses in agriculture, *want* to be *sustainable*. Education is the key, not more regulation.

The modern government grain farmer (that's what he is, a sub-contractor) is a relatively recent phenomena in agricultural history. This *collective* grain producer / worker often refers to the material that troubles his no-(never)-till planter as "trash." *Seems* that "trash" is simply something that's in his way rather than a resource to be re-used. Have you ever walked into someone's house that was a "pack-rat"? One of those folks that

could never give away *anything* and therefore kept "it" stacked all around—with only a narrow walk-path to get through. I've seen places that might be considered a "rat's nest" and a *fire* hazard! In some ways, that is what the government no-(never)-till *subcontractor* has become. While the shop he built to work on his "too wide to turn-around in S.W. WI" ☺ equipment may be clean and tidy enough to let a baby crawl around in, his fields are covered with "*trash*" (unrecycled) and has mere pathways every few inches for each row unit of his planter to travel through. Maybe you think I'm being a wee bit harsh in my description of what has arisen over the past 40 years thanks to the USDA (*unrelenting socialist destruction* of agriculture.) I do realize the majority of my clients receive some type of subsidy payment (or loan assistance) -in fact *all*, if one really wants to argue the point. Therefore, it is not my intent to cause offense. Farmers didn't have the political influence to vote themselves into the present state of affairs (but very large multinational ag corporations

maybe did). After all, which would **you** choose? *Chronically depressed* market prices (as in a *subsidized* system) or the *opportunity* to compete fairly (a free market)? I think most all of my clients consider themselves capable of the latter. **I know that I see you that way.** I think KOW clients are *better* prepared for the future than most other farmers. (By the way, I recently read an interesting article covering the topic of economics and more specifically **The History of New Zealand** in the late 1980s and 1990s. The author, Bob Adelman, in *The New American*, August 30th, 2010, issue wrote of a presentation given at Hillsdale College in 2004 [Michigan, USA] by Maurice McTigue, a former member of the **New Zealand Parliament**. That presentation focused on how New Zealand was able to step back from *falling off an economic cliff*. **It included eliminating most agricultural subsidies and government sponsored advisory services.** My clients may want to “study up” on that bit of history—‘cause it’ll *either* repeat here in the U.S. *or we will* be going *over* that cliff into a *degenerating collective [socialist] system* void of incentive and opportunity. Please pray and vote with me that it’s the former and not the latter!) Yeah, Baby, we’ve come a long way since the 1960s.... From *diversified* livestock farms that included a *forage* rotation and regular tillage to the modern corn-soy “rotation” without forage crops and without tillage.

I recently listened to a presentation by Dr. Joe Lauer at the University of WI Ag Research Station in Arlington in which he rightly spoke of how **new** (in light of *all history*) the corn-soy rotation is, and how long term research plots including alfalfa in the rotation *consistently out-perform* all others on several measures that may indicate **sustainability**. The week prior I also *endured* ☺ a presentation at Arlington on nitrogen rates for *continual* corn (no offense intended to the presenter, it’s the topic). We, as a group, were asked to evaluate the various corn plots for “health” and yield potential, but the thing that sticks in my mind’s eye to this day is how *structurally intact* the **previous** year’s corn stalks were, **standing** between each no-till row, the 3rd week in July! I made the points that the **un-recycled** residue will “tie-up” (*“immobilize”* in agronomy “speak”) nitrogen and require extra to be applied to supply an adequate amount for

grass (corn, non-legume) growth—and that my **greatest** concern, as a dairy nutritionist, would be for the **much greater potential for mycotoxins in the end feedstuff.**

I’m of the considered opinion that farmers are being told too little about **why** we are being recommended *ever more* use of **fungicides** on crops, and mycotoxin binding feed additives in the barn. Back in May of 2000, (Yep! Ten years ago already!) I wrote an article for *Kow Ruminations* titled “Mold / Mycotoxins, A Symptom, Not

the Root Problem,” subtitled “The **growing** problem seems to have some running scared but it’s only a symptom of a sick / unbalanced farm system.” I’m more convinced of this than ever (you may want to *review this 10 yr. old article—it’s posted on my website*).

Who am I, some *intellectual giant*, that I’m the only one that sees how our *conventional ag system* is *designed to promote* parasitic / toxic mold / fungal growth? No. Maybe I’m the only—or one of few—*stupid* enough to write some things that contradict what’s currently *politically* popular ☺! It’s not knowledge hidden from all but a few ruminant nutritionists or microbiologists that if you want a specific micro-organism to grow and multiply, you must *first* create the *environment and nutrition required*. Then, and only then, *seeding* the medium with the desirable—or undesirable—organism will result in an **explosion** of

reproductive growth (the population). This, especially so whenever the competitive organisms are eliminated. This truth / principle is why it is *futile* to inoculate a soil, forage or rumen without *changing* management and nutrition. It is also *futile* to battle *against* an *overwhelming flood* of **multiplying** undesirable / parasitic / toxic organisms *after you’ve created and are maintaining the ideal conditions for their existence!* **The**



For a basic primer on economics, I’d recommend *How an Economy Grows and Why It Crashes*, by Peter D. Schiff and Andrew J. Schiff, Hoboken, New Jersey: John Wiley and Sons, 2010, 233 pages, hardcover.



Speed breakdown of tougher stalks

By Tom J. Bechman, excerpts only, *Wisconsin Agriculturist*, November 2006.

Many who’ve raised **Bt corn are convinced the stalks are typically tougher** to handle and **slower to break down** after harvest. After all, part of the strategy of Bt-protected corn is staying healthier longer, so tougher-than-normal stalks after harvest only make sense.

Dan Childs, certified crop adviser and agronomist with Heritage Seeds/Diener Seeds in Reynolds, Ind., **confirms many farmers’ suspicions.** “Corn hybrids that contain the Bt gene for corn-borer protection, including YieldGard Corn Borer and Herculex I, are often very healthy and **slower to break down** than conventional cornstalks,” he says.

Experts point to three options for dealing with tougher stalks: Add nitrogen in the fall to speed up decay, disk to knock down stalks, or leave stalks and no-till between rows the next spring ... Barry Fisher, coordinator of the Indiana Conservation Tillage Initiative, recommends **no-tilling** into cornstalks and *staying between the old rows using row cleaners*. He suggests leaving stalks alone in the fall.

corpse of a woody old plant stalk/stem is an ideal “home” for mold spores. Yes, it’s a matter of “your system is designed precisely to create the results you’re getting.”

So where are all these toxic molds (more specifically toxic *stressed* mold *manure*-mycotoxins) coming from? The answer is about as simple as why the calf barn needs *regular cleaning*, or better yet make it *personal* and consider the bathroom and shower you use. If the calves are suffering and dying because they are *overwhelmed* by rapidly multiplying toxic organisms, vaccination and antibiotic therapy will have *very limited* benefits. In a cropping system, the parallel would be plant breeding and pesticides. These things truly are areas of agriculture that science has made great gains in, but wisdom / experience / history *warns* us it is foolhardy to trust in bio-tech *alone* to solve problems (as we only end up *selecting* for *resistant* weeds, insects, and microbes / diseases). Yet that’s the 4-lane highway most government grain producers are still traveling, because financial incentives are entrenched (for a time) that make it lucrative *to sell products* to treat (“manage”) rather than address / eliminate the root cause **and many are planting more acres than they have time to manage in any other way.** So often in farm management, this is the case, “solution” “A” or “B” are offered but the **preventative** option “C” is never explained. If not for our *national economic* crisis on the horizon (you haven’t seen anything yet), one might think there would be no end to the *artificial* (subsidy) financial incentives planned to maintain the status quo. The promotion of no-(never)- till as the **only** / best option for soil conservation is entrenched so deeply into the Federal Government that even the EPA’s (Environmental *Progressive* Agency) latest regulatory “*power grab*” includes **mandatory no-till** days in order to “save us” (ha!) from **dust** (yep, big gov wants to regulate *dust*! No kidding...Contained within EPA’s 2nd draft policy assessment for particulate matter under the heading of *national air quality standards*. Of course, this *won’t* be limited to the tillage of the soil—but we are told it is *intended* only to apply in arid climates.) This noting nothing of the NRCS (Natural Resources Confiscation Socialists? ...I’m just being creative here.☺ Please forbear my warped sense of humor) 590 nutrient management program requirements for “*tolerable*” soil loss (“T”) that, although not without merit, are *highly promotional* of no-(never)-till. Again, this wouldn’t *just happen* to have *anything* to do with how multi-national bio-tech and pesticide corporations benefit from continuous no-(never)-till management? *Regulated sales*?? Please forbear my contrary attitude, I’m just of the *understanding* that all these environmental laws and regulations would better *serve citizens* (instead of *political* entrepreneurs and bureaucrats!) if they were voted for / implemented on a **local** – and *possibly state* level (there are very few things the *federal* government is *suppose* to have the **constitutional authority** to do *for*

us, but the present state of affairs has it doing *much more to us*). Why is no-till the sacred cow of conservation? Is it because it’s the *only/best* way of reducing soil erosion and increasing soil organic (carbon) matter (sequestration)? Or is it because it is the most lucrative to crop input companies that can afford to have a political lobby on the federal level? Well, I’m of the considered opinion that it *could* be the latter.

Shouldn’t we farmers and agri-businesses be asking what the “end goal” is to all this **endless increasing** of *banking*, subsidy and regulatory power by our federal government? Have the government *loan guarantees* and grants actually *depressed* our markets by *encouraging expansion* and over-production? Would private capital be risked for this? If not for *government loan guarantees*, could so many dairy farms be *expanding* in this *down* market? Will farms soon be so tightly regulated (controlled) that the **freedom** to *manage* them as we think best, as *individual owners*, is *gone*? Our federal government has a regulatory “czar” by the name of Cass Sunstein (former professor of law, political science, University of Chicago). Why “czars” in a constitutional, *representative* republic? Who **voted** for “czars” and *more* regulations? Has anyone asked, based on Professor Sunstein’s past work and associations, whether or not he views farmland and the regulation / management (*control*) thereof to be a **private property right** or *collective* (social) obligation? Answers to these questions may *shock* you. Again, which is *real* progress, education or cohesion?

That which is *collectively* owned / controlled / managed is neglected/abused by all equally. This is why/how

Excerpts from *Walking your fields* (Pioneer Seed) 9-17-10, issue #10 by Arnie Imholte and Matt Pauli.

... **Anthrachnose** is a fungal disease that affects multiple grass species such as corn, grain sorghum, and small grains. **The pathogen overwinters in diseased leaves and stalks** then produces **spores** when weather warms in the spring. Spores spread by rain and wind ...**Gibberella**, like anthrachnose, **overwinters in corn residue** then produces spores the *next season* ... **Northern Corn Leaf Blight (NCLB)** thrives in relatively cool temperatures and high humidity and available moisture. **It overwinters in diseased corn leaves and husks and other plant parts** ... Spores are carried long distances by the wind ... **Reducing previous residue** –Reducing the amount of inoculum through either **crop rotation or tillage** can help delay next year’s infection. **No-till or reduced tillage fields have higher levels of residue** and, in turn, the **highest risk of infection.**

collective (socialist) farm management ultimately results in *starvation*. While private individuals can (and do) make mistakes, only governments can afford to stay on the wrong course long enough to cause real disasters, poverty and hunger. **This increasing problem with grain quality (mycotoxins) is one tiny example of continuing on the wrong path.** I can cite our very own federal USDA-ARS research to my support position, as well as numerous points we've come to understand *scientifically* about soil "health" maintenance-to support my position that- **there is a positive and valuable justification for fall tillage.**

First of all, I will postulate that if we wish to maintain a *healthy* agricultural system (free of toxic-*troublesome levels* -of mycotoxins), **mature, woody, dead things need to be buried.** Residue or "trash" left on the surface may have some *limited* ability to reduce the velocity of raindrops, the impact of weather event induced *erosion*, but most of us have also seen that same "trash" *carried off* the field (with soil) under conditions of heavy water flow. To quote University of Minnesota soil scientist Gyles Randall in the November 2001 issue of The Farmer/Dakota Farmer, "In my travels, I've never seen as much erosion as in the last few years. We've had some intense rains, but we've also converted the landscape to a crop production system (corn and soybeans) that is extremely susceptible to soil erosion." The USDA federal farm program **promoted** this.

Farmers intent on improving the quality of their soils have made an interesting discovery: No-till is not enough. They've found that while no-till certainly helps protect the soil, it doesn't provide the biological activity needed to *improve* it. To achieve that lofty goal, they're adding cover crops to their crop rotations.

Successful Farming, December 2009, "Cover crops help build soil quality", by Larry Reichenberger. Emphasis added.

Additionally, it has now been demonstrated / *proven* that, without **tillage to disrupt root and worm channels**, manure / nutrients **very rapidly** flow / leach below the topsoil / root zone, resulting in poor recovery and risk of ground water contamination. The **best** soil conservation and nutrient management practices combine fall **tillage** with incorporation of woody plant residue and **manure** with a **cover crop** planted immediately following.

To quote from Agricultural Research magazine of July 2007 in an article titled *No Shortcuts in Checking Soil Health*: "Organic farming can build soil organic matter **better** than conventional no-till farming can..... Many agriculturalists believe that no-till builds soil better than organic farming, **which uses tillage** to incorporate manure and control weeds. Tillage is known to destroy soil organic matter. But (John) Teasdale's study showed that **organic farming built up soil better than conventional no-till because use of manure and cover crops more than offsets losses from tillage.**" Fortunately, Dairy Farm management, whether or not USDA certified organic, lends well to implementing the practices that Mr. Teasdale claims are **superior** to

continuous no-(never)-till. Yes, again, I think **dead things should be buried** (into the topsoil as a crop residue)-**but then we should plant something "beautiful" over their "graves."** However, only *education* (not regulation) is required to encourage farmers to adopt the practice.

Cover crops are beautiful

While our wives may be *challenged* to understand how we see *beauty* in growing something we *do not expect* to see *colorful flowers* in, we'll need to remind them that beauty is in the eye of the beholder, and that mostly *green* works for John Deere ☺ (and that they alone *fulfill* our needs to gaze upon *stunning* beauty! ☺) The beauty in cover cropping is in the *utility*, much like the tractor. While the **dead, brown** (and ugly) **residue of the previous crop left upon the surface of the soil provides for a "home" for parasitic / toxic mold**

spores to overwinter (and infect the following year's crop) and leaves **leachable** nutrients on / near the surface -to be washed off with water flow, the new *green, growing* shoots, leaves, and root system of a **fall cover crop** is *scavenging* / capturing leftover *soluble* nutrients and holding ground cover / soil in place. Additionally, with the crop residue *incorporated into* the topsoil (often mixed with livestock manure) and the fall cover crop's root system exuding *sugars* and other *microbe nutritious* factors into the rhizosphere, **beneficial** mycorrhizal **fungi** that produce a "sticky" substance known as **glomalin** (that helps to create soil *aggregates*) are **improving** -evening **making** -the soil (doing *better* than mere no-till residue left on the surface). To quote USDA -ARS researcher Kristine Nichols (*Agricultural Research Magazine*, July 2008, pgs 20-21, emphasis added):

Before the discovery of glomalin, other researchers described the hyphae of **mycorrhizal fungi** as *forming a sticky string bag, with the hyphae acting as the string* and some other substance on the hyphae sticking sand, silt, and clay particles, plant debris, and other organic matter to the hyphae -like little gobs of chewing gum. Photographs of glomalin on hyphae indicate that glomalin might be these "gobs of chewing gum." *The sticky string bag starts aggregate formation which is a major part of what makes soil.* *Aggregates provide structure to soil for better water infiltration, water-holding capacity, and gas exchange, and increase soil fertility by providing organic carbon (that is, food) to soil organisms, which use this food as energy to release plant nutrients from the soil.* Nichol says.

Nichols uses glomalin measurements as a quick guide to evaluate how *soil friendly farming* or rangeland practices actually are. The amount of glomalin present is also a measure of how much carbon is being stored under various practices, so quantifying glomalin could be used in conjunction with *carbon-credit-trading programs*.

Nichols has done studies on cropland as well as on rangeland. On cropland, she found that **both tillage and fallowing** ...—*lower* glomalin levels by destroying living hyphal networks. The networks are physically torn by tillage **or broken down due to starvation during fallowing** ... The higher a soil's glomalin level, the better its tilth, or feel and structure, **the less its susceptibility to erosion** by either wind or water, and the better it is for the growing plants.

Excerpts (emphasis added) from

Mycotoxins start in the field ... not the silo

By Mike Rankin, August 10, 2002, *Hoard's Dairyman*. The author is a crops and soils agent with the University of Wisconsin Extension, Fond du Lac County.

The number of complaints pertaining to mycotoxins in **corn silage** has **grown** over the past few years. Mounting evidence continues to point toward mycotoxins usually being a **field rather than a storage** problem ... In the northern U.S., the *Fusarium* mycotoxins are often cited as being present and / or causing nutritional problems ... These molds are responsible for a wide range of diseases, including several stalk and ear rots in **corn** ... The most commonly produced mycotoxins from *Fusarium* molds are: DON (vomitoxin); T-2; Zearalenone; and Fumonisin.

Of these, DON is most often identified as being present in **corn silage**. However, numerous feeding studies and surveys have **not** been able to conclusively show a negative cause-effect relationship for dairy cattle based on elevated DON levels. Rather, most researchers agree that it is probably just a **marker** for some "yet to be determined" troublesome compound.

Meanwhile, T-2 can cause health problems in dairy cattle at lower levels than DON but is much less common. Fumonisin and zearalenone are **not** thought to pose major health risks to cattle ... there are still many questions to be answered regarding mycotoxin identification, development, and feeding effects. Although this discussion was limited to *Fusarium*, other types of molds such as *Penicillium* and *Aspergillus* produce harmful mycotoxins, as well. **Do what you can to prevent stalk and ear mold development in the field.** Confirm any perceived mycotoxin problems by testing feed samples.

Very exciting, maybe even "*beautiful*" stuff—excepting that suggestion that glomalin measurements might be useful in that *awful Marxist* carbon trading scheme ...but what should I expect from someone employed by the USDA ☺? I simply *disagree* with that *application* of that bit of knowledge. The reason I quote these **USDA researchers** is to *establish* that, even our own *wrong-headed* federal system already possesses the knowledge, that *if* rightly applied (the *definition of wisdom*) **could significantly reduce the growing problem with fungal diseases on grain crops and mycotoxins in feedstuffs**. Additionally, some **limited** use of tillage (although *excessive* use can be damaging), could actually help all farms to **better** control weeds and **diseases**—while at the very same time *reduce* nutrient runoff / leaching risks and actually **better** build soil quality. Overall, it would be more "*sustainable*". **No-till has us feeding the wrong type of fungi!**

I realize my clients may be thinking "You're preaching at the choir, Tom" because you're already rotating crops frequently (including perennial legumes and grasses) and using tillage to incorporate residue and manure. Of course, I realize this. Yet I wanted to establish the root (pun intended) source of the increased amount of mold spores available while providing the *solution* I think agriculture will need to return to in order to make *sustainable* progress with the problem. Furthermore, just because *you* are using *better* practices on **your** farm, *doesn't* mean your no-till grain producing **neighbors** cannot increase *your* risks manifold. **These unburied mold spores can readily travel with the wind.** While you should **not** feel guilty for the *intelligent* use of tillage (some circles of influence may send the message that you're a poor steward of the land *whenever* you till it), the current state of affairs may require *extra* effort on your part to keep your fields "*clean*" of fungal inoculums. The *ideal* situation would be a tree line windbreak at every fencerow, *if* your neighbor is a continuous no-(never)-till grain farmer (but that is unlikely or *not a practical* management recommendation). However, intelligent / intentional use of **fall tillage with a cover crop** is a reasonable proactive measure that can be taken—with multiple benefits to your farm beyond *reducing* the "homesites" for mold spores on your acreage.

The "number one thing" that can / should be done to reduce the amount of fungal / mold and *potential* mycotoxins *in your farm system* is to **maximize the number of acres you maintain as perennial legume and cool season grass pastures and hayfields**. This is usually at its maximum for dairy cow *needs* when you're near 2 acres per each *lactating* cow. (This includes forage production for dry cows and heifers.)

I list this as the *first* priority because *most* of the mycotoxin problems the dairy farmer has to deal with are

found in the **grain or corn silage** (excepting endophyte infected fescue in some areas). **The less corn and / or corn silage you feed, the better off you're going to be.** Forage crops that only stand in the field / pasture for 20 to 40 days before harvest / grazing are exceedingly rare as a source of mycotoxiosis. They simply are not exposed to as much **insect damage and time** for fungal growth to become a *significant* problem. *Annual warm season* grasses (such as BMR sorghum-sudangrass) that are harvested / grazed in an *immature* (vegetative) state are also a good alternative for forage yields without any *significant* risk of bringing mycotoxins in from the field. *Oftentimes* a double-crop scheme of BMR sorg-sudangrass following *first* cutting and, in turn, followed by a fall-winter annual (cover) crop will *very economically* match the yield of corn silage (and require less feed supplement in the barn). Additionally, a summer annual like BMR sorg-sudan may provide a late summer-early fall opportunity (immediately after harvest) for early establishment (with or without tillage) of soil structure / fertility improving crops such as **oilseed radish** (tillage [*large taproot* to correct for heavy traffic damage / compaction] or forage [for late grazing – include **oats**), **red clover or hairy vetch** (both fix nitrogen) allowing for both soil quality improvement and more economical forage production the following season. *Combinations* of some (or all) the above –with **winter cereal rye** (or winter triticale) are worthy of consideration. It is also noteworthy that brassica / radish / mustard-type crops (including canola) produce compounds called **glucosinolates** that break down to *natural* chemicals similar to that which is marketed in the commercial soil **fumigant** called “Vapam”. **These type of cover crops can help rid the soil of toxic fungi and parasitic nematodes.** Combine this with a manure application.

Whenever **corn** is grown for *silage*, following with an establishment of winter cereal rye or triticale is *highly* recommended to KOW clients. Fortunately, especially when winter rye is the chosen cover crop, you have extra time for establishment / planting. I *generally* recommend *anytime before* Thanksgiving Day as adequate, but the sooner the better (Although I've seen winter rye succeed planted even later!). One other noteworthy, unique option I would suggest, take the time to prepare a smooth seedbed in the fall so you can simply broadcast (and roll-in) either alfalfa or red clover and grass in the early spring just as the winter cereal rye is greening up / emerging. Use it as your establishment nurse crop for a new hayfield or pasture. This I have witnessed as a *successful* way to both reduce / eliminate some spring labor / tillage and result in excellent *perennial* forage establishment. Combine this practice with incorporating manure.

Whenever **corn** is grown intentionally for **grain** production (only), I would *highly* recommend that a **high oil** hybrid is selected because they are less susceptible to mold / mycotoxin infestation. If stalks are not

removed at the end of the season, they should be tilled into the topsoil (with manure) and a similar cover crop should be established as described above. Finally, it is best to only plant corn *following a legume* (ideally a *perennial* one) and never following a small grain or previous corn crop –if you wish to have the *highest yields* free of troublesome levels of mycotoxins.

Excerpts (emphasis added) from
Manage corn mold

By Jim Linn, December 2009, *Dairy Today*. Jim Linn is an Extension dairy nutrition specialist with the University of Minnesota-St. Paul.

The molds or fungi of greatest concern this year are *Fusarium*, *Penicillium*.

... Visually inspect feeds for molds. *Fusarium* will appear pink/red to white. *Penicillium* will be blue/green to gray ... These molds in themselves can affect the health of cattle in an inconspicuous way through lowered immunity, poor health, and diarrhea or possibly **hemorrhagic bowel syndrome** ... Test **grains, grain byproducts** and **corn silage** for mycotoxins ... Common mycotoxins produced by molds are deoxynivalenol (DON), T-2, and zearalenone by *Fusarium* and ochratoxin and patulin by *Penicillium*.

Mycotoxin symptoms in dairy cows include reduced feed intake, rumen upsets and altered fermentation of feeds, suppressed immunity, increased metabolic and general health problems at calving and poor reproduction.

... Assess options if molds and mycotoxins are present in feed. The best solution is not to feed the contaminated feed, but this isn't always possible.

The rumen can partially degrade mycotoxins, so dilution of the contaminated feed with clean, high-quality feed is a way of feeding some contaminated feed. The exact dilution rate or amount that can be fed will depend on the type and amount of toxin present and the animal receiving the ration. Feed diets that are balanced for minerals, vitamins, fiber, energy, and protein. **Acidic diets may exacerbate the effects of mycotoxins.**

... Finally, consider adding a mycotoxin binder product to the diet. **The efficacy of most of the products that are available have not been tested by FDA, however.**