MARYLAND COOPERATIVE EXTENSION
UNIVERSITY OF MARYLAND
COLLEGE PARK • EASTERN SHORE

Newsletter

Special Drought Edition *July 2007*

Drought Induced Financial Stress

If your farming operation will be experiencing drought induced financial stress, here are some suggestions:

- If the current drought will cause you financial stress, now is the time for "damage control". Don't avoid your financial problems; they are not going away.
- Do a monthly or quarterly cash flow budget for the next year to determine when you are going to fall short on cash and how much you will fall short.
- Keep in good communication with your creditors. Don't avoid them. Tell them your general situation before you get into serious trouble.
- If you can't make your payments, ask your creditors if you can postpone principal payments. Some of your creditors may allow this, just as long as you are making your interest payments.
- Try to make at least partial payments to all your creditors. Some creditors can be pacified as long as they know that you aren't overlooking them and that you are trying to pay them something.
- Make careful decisions on where your limited cash income will be used. Avoid the "squeaky wheel gets the grease" syndrome. Just because someone is "breathing down your neck" to get paid, doesn't mean that it is most important to pay them first. Objectively develop some criteria to make your decision on who gets paid, how much they get paid and when they get paid.
- Refinancing debt over a longer term is an option for some individuals to improve cash flow by spreading out principal payments.
- Take advantage of disaster relief programs that may come down the pike.
- Scrutinize every expense. Cut costs.
- Change production plans towards less capital intensive enterprises.
- Sell unproductive capital.
- If you must make capital purchases, consider leasing or renting for the short term.
- If a field is severely stressed, it may not be worth harvesting. Do the economics.
- Look for ways to reduce living expenses.

Source: Dale M. Johnson, Regional Farm Management Specialist. Univ. Of MD.

Feed To Sell?

Do you have feed to sell or do you know someone who does? We are assembling a list of those who have hay, silage, standing com or other feedstuffs for sale. We will publish this list in and distribute it next month to our mailing list as well as put it on our web site. Call or write us giving your name, address, and telephone number, along with the kind and amount of feed you have, and whether or not you will deliver. Please be as specific as possible. For instance, don't just report you have hay for sale, but instead indicate you have 1,000 bales of first cutting alfalfa and will deliver. We don't need to know the price ... that's between you and the buyer.

More Yield from Older Alfalfa Stands

Research work done in 1997 at the Central Maryland Research Farm (CMREC) at Clarksville, MD has shown the benefit of planting triticale into older alfalfa stands. Triticale was seeded in mid-October at 100 lbs. per acre.

The alfalfa had previously been cut on September 19th and was about six inches high when the triticale was seeded. No herbicide was used for suppression. Three different nitrogen rates were compared: 0, 80, and 120 lbs. Top dressing was done in mid-March. The alfalfa-triticale was harvested on May 18, 1997, while the triticale was still in the boot stage. The following yields were observed:

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Nitrogen	0% Dry Matter Yields	65% Moisture Silage
0 lbs.	1.63	4.65 tons
80 lbs.	2.11	6.02 tons
120 lbs.	2.35	6.72 tons

It appears that around 100-120 lbs. of nitrogen will yield the most forage. Although this was not an experiment, this field trial indicates that additional forage can be obtained by interseeding triticale into alfalfa stands, without hurting the stand. Subsequent cuttings of the alfalfa plots after 1st cutting, appeared to be normal with no loss of the stand.

Producing Extra Forages
The following information should be helpful in deciding how to produce extra forages this fall to makeup for poor pasture and com silage production this summer.

Barley - Seed mid-August to late October at a rate of 2-3 bushel/Acre. The higher rate is better. Remember the purpose is forage, not grain. Rye is different, since it can be seeded up to January, germinate in March and still make a harvestable crop.

With barley, well fertilized late summer seedings and a moist fall can make 12-15 inches of vegetative growth by Thanksgiving. Some farmers have done some mechanical harvesting in November, but usually these grains are grazed down to three inches. The grazing forage quality is excellent into January then declines slowly through late winter. Fall plantings should be given 50-75 lbs. nitrogen (or manure equivalent). Apply nitrogen (or manure) again in late March to early April for spring growth. Spring growth can be grazed or chopped at boot stage; rye on or about May 1; triticale around May 10; barley around May 15 (more or less).

Wheat - The recommendation for wheat is the same as barley except do not seed before September 28th. Wheat needs to emerge after the Hessian fly free date. Yes, they are still here!

Spring Oats - Seed mid-August to late September at a rate of 2 ½ to 3 bushel per acre. Seedings emerged by September 10-15 will start to come into head by November 15-20. Oats can be chopped to fill silo, made into round bale haylage or grazed. If desired for grazing, begin at 6 inches of growth. Flash graze paddock by paddock. Oats will stop growing when the ground begins to freeze. The quality will hold until after several very hard freezes (20 degrees F or less) then decline slowly. Oats will die over the winter with no spring re-growth. Oats may be seeded with Austrian winter peas for more protein then chopped for silage in mid to late November.

Oats can be seeded with rye; two bushels of each. This gives a good fall harvest and a spring harvest of the rye. Also oats can be seeded with annual ryegrass. Plant 2-3 bushels of oats and 25-30 lbs. of ryegrass to the acre. You can chop or graze this mixture by Thanksgiving.

Annual Ryegrass - Seed mid-August to early October at a rate of 30 lbs./A. Early seedings may be tall enough to chop by late November. You should graze off any growth over 3-4 inches before winter. Ryegrass really likes nitrogen, especially in the spring! You can begin grazing it by early April. Plan 15 day intervals between grazings. It can be chopped by late April when it reaches 20-24 inches in height. Plan to chop on a 20-25 day schedule. Be sure to apply 50 lbs. of nitrogen per cutting.

Grass Pastures - Do not forget to apply Nitrogen in early August to any grass pastures or grass hay fields that can be pastured between October and December. Remember--fall forage growth still depends upon rainfall!! If good moisture is present by September 1st - go for it! Remember dairy heifers can do okay on fescue after frost in the fall.

Reduce Threat of Nitrate Toxicity
As the drought continues the possibility of nitrate poisoning becomes more of a concern. All plants contain some nitrates, but excessively high levels are likely to occur in forages that have been growing under stressful conditions. Thus, when corn that is fertilized for high grain yield is stunted by drought and is alternatively harvested for silage, problems can occur. Other plants, such as Sudan grass, sorghum, pearl millet, oats, orchardgrass, and tall fescue, can accumulate nitrates at high levels. Also, many common weeds found in corn like redroot pigweed, common lambsquarters, ragweed, velvetleaf, witchgrass, canada thistle, and black nightshade can accumulate nitrates.

The highest levels of nitrate accumulate when drought occurs during a period of heavy nitrate uptake by the plant. A drought during or immediately after pollination, is often associated with the highest accumulation of nitrates. Extended drought prior to pollination is not necessarily a prelude to high accumulations of nitrates. The resumption of normal plant growth from a heavy rainfall will reduce nitrate accumulating in corn plants, and harvest should be delayed for 3 to 4 days after the rainfall.

Under normal feeding situations, the nitrate levels in feed must be well over 1.76 percent to cause a problem. Very few forages, particularly corn, contain levels that will produce toxicity. If, however, growing conditions do favor the accumulation of nitrate in forage, the following management practices will greatly reduce the chances of problems occurring.

Consider ensiling the forage; this will reduce nitrate levels. Studies at Purdue University showed that ensiling corn forage reduced nitrate concentration by about one third. Feeding should be delayed until the fermentation process is complete. This usually takes about 4 weeks. Purdue University studies have also shown that addition of 20 pounds of limestone per ton of silage going into the silo further reduced nitrate levels. Addition of more than 20 pounds per ton adversely affected fermentation and quality of the silage. Limestone tends to raise the pH which, in turn, can reduce silage quality.

Nitrate levels in silage also can be reduced by **chopping only the top two-thirds of the plant** since nitrate accumulation is highest in the bottom third of the stalk or stem. Leaving that much of the plant in the field is often a difficult decision but it may be less costly than the possible loss of animals. Stalks left in the field can be a source of nitrogen for next year's crop.

Ensile at the proper moisture content (60 to 68 percent), chop clean and pack well. Proper ensiling procedures improve the fermentation process and help to reduce nitrate levels.

Application of anhydrous ammonia to drought-stricken corn is not recommended. The additional nitrogen has the potential to impede the breakdown of nitrates in the rumen, particularly if energy is limited in the ration. Before starting to feed the forage, have it chemically analyzed for nitrate content.

Dilute known high nitrate feeds with low nitrate feeds, such as grain or legume hay, to reduce the percentage of nitrate in the daily ration. Grain feeding seems to be helpful in addition to its effect in diluting the nitrate content of the feed. Energy from the grain helps to complete the conversion of nitrate to ammonia, which is then used by the rumen bacteria to make bacterial protein. Corn forage is normally a high-energy fed which favors the use of nitrate in the rumen. Sudan grass, on the other hand, is a low-energy feed which, by itself, does not promote the conversion of nitrate to ammonia.

Frequent intake of small amounts of a high nitrate feed increases the total amount of nitrate that can be consumed daily without toxic effects. Feed limited amounts several times daily rather than large amounts once or twice daily. With frequent intake of limited amounts of high nitrate feed, the concentration of nitrate in the rumen does not become extremely high at anyone time.

Feeding frequency and grain feeding recommendations to reduce the risk of nitrate toxicity refer primarily to milking cows. **Extreme caution should be used if bred heifers or dry cows must be fed feeds containing greater than 0.44 percent nitrate ions.** Typically these animals are not fed more than once daily, nor are they fed large quantities of grain, the primary ways to prevent toxicity if high nitrate feeds are fed. Young heifers should not be given feeds that are not safe for all livestock to consume.

Introduce questionable feed slowly over a period of a week or two so that the rumen bacteria can adapt. All sound management practices that are conducive to a successful feeding program should be followed when high nitrate feeds are fed.

Be sure that the ration is balanced. A balanced ration that provides needed nutrients will tend to reduce problems from nitrates in the ration. Rations should be adequate in vitamin A as well as other nutrients. Excessive vitamin A fortification does not appear to be necessary.

We have several fact sheets that may be helpful in dealing with this summer's weather. They are titled:
FS 426 - Causes and Prevention - Nitrate Poisoning of Livestock
FS 427 - Causes and Prevention - Prussic Acid Poisoning of Livestock
FS 433 - Harvesting and Feeding Drought-Stressed Corn
FS 444 - Aflatoxins
FS 483 - Determining the Value of Drought-Stressed Corn
FS 500 - Alternative Feeds for Beef Cattle Agronomy Facts 23
FS 775 – Annual Ryegrass Forage Management in the Mid-Atlantic

If you would like to get copies of any of the above, call the Frederick County Cooperative Extension Office at 301-600-3576 or visit our web site at http:/extension.umd.edu/local/Frederick.

Best Use of Corn Crop For Dairy & Beef

Some of you may be wondering how best to use your corn crop this year. Making enough silage to last the entire year should be your first priority. Even if you end up using acres you intended to harvest as grain, or even if you need to buy standing corn from a neighbor, corn silage will end up being your most economical feed. Only after making all the silage you need should you consider harvesting corn for grain.

Silage Additives Necessary?

Are silage additives necessary for use with corn silage this fall? Drought-damaged corn can make good quality corn silage and the feeding value pound for pound is not much different from high yielding corn in a normal season. Even if there is little or no ear present on the stalk, much of the energy that would normally be used for grain production will be contained in the stalk. This energy will provide sufficient available carbohydrates necessary for the fermentation process. Due to the reduced weight normally added by the ear, you should pay special attention to: 1) length of cut - 3/8 inch theoretical, 2) moisture content 32% - 36% dry matter, and 3) packing in the storage structure. If attention is paid to these three details, special silage additives are not needed to get proper fermentation.

Now is the Time to Plant Forage Turnips, Rape or Swedes

It is still not too late to plant forage turnips, rape or Swedes for cattle or sheep grazing late this fall. These members of the brassica family can provide additional fall grazing for livestock in a short 45 to 60 day growing season, if adequate rainfall occurs. Yields of turnips, swedes, or rape can approach 10 to 12 tons of dry matter per acre with very little investment. The brassicas can be planted up to the first of September either with no-till or conventional tillage techniques. Three pounds of seed and 700 Ibs. of 10-10-10 fertilizer per acre is all that is required at planting time. Turnips have been the most widely used brassica in our area for sheep. Sheep will eat the entire plant including the bulb. Nutrient content of the brassicas will meet the requirements of growing heifers or ewe lambs. It will more than meet the nutritional requirements of pregnant beef cows, dry dairy cows, or sheep. One acre of turnips is capable of feeding 100 ewes, or 20 mature beef or dairy cows for 10 days. Swedes and rape may be more suitable for beef and dairy animals since more foliage is available and these plants do not have a large bulb for cattle to eat.

Make Plans for Alternative Winter Feed Supplies

Straw and crop residues may be the answer for many beef cow owners, but since these are poor quality feeds, additional protein will need to be added when feeding these roughages. Treating baled straw or corn stover with anhydrous ammonia may be an option that needs to be looked at closely by some of you. Research and experience indicate that treating bales of these low quality roughages by adding 3% by weight anhydrous ammonia or 60 pounds per ton could add some 8% to crude protein and 10% to 20% to TDN. If you plan to treat these low quality roughages with anhydrous ammonia, be sure you have the equipment you need and follow precise instructions and recommendations as you treat. **Peanut hulls** can be another alternative roughage source. They are a poor source of energy, but are high in fiber. **Cottonseed hulls** are much better, but will probably be too expensive. **Corn cobs**, if available, are a very good fiber and a fair energy source. **Broiler litter**, in areas where it is available, is probably the best and most under-utilized alternative feedstuff. Broiler litter works well for wintering pregnant beef cows and stocker cattle. It may be mixed with corn silage or mixed with corn grain and fed at the desired level. Remember, if you are going to use broiler litter, deep stack it (preferably under an open shed) so that it will have time to go through a heat period which will further dry out and destroy any pathogens that might be present.

Early Weaning of Calves an Option

If dry weather has seriously reduced your pasture and forage supplies, weaning calves early can pave the way for selling off part of your cow herd if conditions are that drastic.

Calves can be weaned as young as 40 days of age, say North Dakota livestock specialists. If they weigh 200 pounds or more, they do not require milk replacers. Early-weaned calves started on high energy rations of two-thirds to three-fourths concentrates will make gains comparable to those left with mothers on good pastures.

Early-weaned calves started in a drylot should be fed grain on the basis of about I % of their body weight, or about two to three pounds per head per day. Rations need to be complete. You may want to include molasses in a starter ration to reduce dust from chopped hay. Avoid feeding alfalfa pellets, since calves tend to eat only the pellets.

Calves can be hand-fed a starter ration until consumption reaches four to five pounds per day, which normally takes about two weeks. After that, calves can be switched to another ration fed in a self-feeder. Medium frame calves should gain about two pounds per day from their sixth or eighth week to 205 days of age. Calves will

consume about nine pounds of feed per day during the early weaning period.

Calves are susceptible to stress for the first two weeks after weaning. For that reason, castration, dehorning, and branding should be done about two weeks prior to weaning. Also, a good immunization program is necessary. It's advised that no calf should go on a concentrate ration without receiving a seven-way clostridial vaccine. IBR and BVD are also required vaccines (use killed vaccines for young calves). Several other vaccines may also be needed, check with your veterinarian.

Extend Grazing Far Into the Fall as Possible

Extending grazing as far into the fall as possible is more important this year than ever. It will pay you to remove beef cows from those fescue pastures and fertilize with 50-100 lbs. of nitrogen. Then allow the fescue to stockpile until after you have a killing frost. Cattle will continue to graze fescue even when it is under light snow cover. Other grass pastures will also benefit from 30-50 lbs. of nitrogen. Topdressing is an investment that could pay big dividends if we have the right kind of fall weather. Remember to keep cattle off newly fertilized fields until at least ½ inch of rain has fallen. This will prevent cattle from consuming piles of fertilizer which may have unintentionally been left in the field. Cattle can be poisoned by eating nitrogen fertilizers.

Think Twice Before Liquidating Herds

Think twice before giving into the urge to liquidate entire beef herds because of limited or non-existent winter hay supplies. Instead of selling out, you should look at strict culling. Now is the time to cull those old, open, unsound, unproductive cows. Pregnancy testing the cow herd this fall will pay big dividends in feed savings. Selling off herd bulls early that you won't need next year, can be an additional savings. Keep only those fast gaining larger heifers for replacements ... those that will reach 750-800 lbs. at one year of age and will settle early in the next breeding season.

Determining the Value of Drought-Stressed Corn

Drought-stressed corn for grain or silage does not automatically signal disaster, as both crops can provide high quality forage for ruminant animals. Drought-stressed corn or corn that is un-pollinated will produce little or no grain crop for the crop farmer to sell, but dairy producers can use the un-pollinated corn for silage. On a dry matter basis, the drought-stressed corn will be approximately equal in feeding value to normal corn silage.

Results of feeding trials indicate that silage made from plants with few or no ears have 65 to 100 percent of the value of normal silage, when comparing feed efficiency, milk production and growth rate. These comparisons were made on a dry matter basis.

The best way to determine the feeding value of drought-stressed silage is to test the forage. Forage analysis is useful for buying or selling the silage, or for ration balancing. Table 1 is a comparison of forage analyses for normal and drought-stressed silage.

Because of the higher crude protein, and only slightly lower TDN values of drought-stressed silage, buyers of such silage should be willing to pay almost the same price as they do for well-eared silage of equal dry matter content.

Table 1. Comparison of forage analyses for normal and drought-stressed silage.

Type of Silage	DM	CP	ADF	TDN
percentage dry matter				
Normal				
silage	35	8.5	28	68
Stressed				
silage	25	10.0	34	62

There are several ways to determine the dollar value of drought-stressed silage. Regardless, both the seller and buyer must value the silage according to how they will use it in their operations. Dairy producers can use silage for needed forage, and crop farmers can use the drought-stressed silage to recover some of the cost of producing the crop.

One common pricing formula for silage of approximately 30 percent dry matter, is to multiply the market price of corn by six then add $4 to $5 per ton (do not add if buying standing corn) to cover the costs of harvesting and storing the silage. If the market price for corn were $4 per bushel, the silage would be valued at $28 to $29 per ton.

To determine the price of silage based on feeding value, approximately 1 ton of 30-percent dry matter silage is equal to 1/3 ton of hay or 8 to 10 bushels of corn. Assuming a hay price of $150 per ton or a corn price of $4 per bushel, the silage would be worth approximately $50 and $36 per ton respectively. Therefore, given the feeding value of the drought-stressed corn and the

relative prices for hay and corn, the silage would be worth an average of $43 per ton.

The seller must evaluate the value of the crop to sell, as plow down or on which to receive disaster relief payments. One or all of these alternatives should be explored in the current market conditions. Finally, the actual selling price of drought-stressed silage varies according to geographic location and the demand for the crop for dairy or livestock feeding.

While drought-stressed corn is valuable to both dairy and livestock producers, there are problems related to its use.

1. Because drought-stressed corn has the potential to accumulate nitrates, nitrate toxicity of animals is possible. Do not feed green chop drought stressed corn.
2. Nitrogen oxide gas during fermentation of drought--stressed silage. Precautions must be taken when ensiling drought-stressed silage and when removing the silage from the silo for feeding.
3. The use of non-protein nitrogen (NPN) on drought-stressed silage is not recommended.

Drought-stressed silage is not necessarily a totally lost or failed crop, but properly managed can provide necessary feed for the dairy or livestock operation and recovered income for the crop farmer.

Web Sites for Farmers Looking for Hay and Drought Information

Following are some web sites that list farmers who have hay for sale in most of the States.
www.hayexchange.com/
www . forages.css.orst.edu/Topics/Hay /Marketing/index. html
www . forages.css.orst.edu/Resources/Vendors/Hay /index. html
www.morgan-research.com/forages
www.mdforages.umd.edu

Miscellaneous Drought Information:
http://www.penpages.psu.edu

Once there, click on the "Search" box, enter the keyword: drought, click on the "Submit" box and the list of titles will appear.
www.ag.ndsu.nodak.edu/drought/drought.htm

Others:
http://sphinx.ucdavis.edu/research/footwarts/pdd.html

Nutritive Value of Drought Soybeans

Drought stricken soybean plants can be used as a forage crop. Allow plants to mature as much as possible before harvesting. Some pod or bean development enhances feeding value of plants harvested either as hay or silage. Soybean forages are high in calcium (about 1.3% on a DM basis). For this reason it should be avoided as the major forage for dry cows.

If ensiling, it is important to ensile before plant moisture drops below 60-65%. If possible, mix soybeans with other forages, preferably during ensiling, to enhance their palatability. If plants are high in moisture and lack pod or bean development, add 100-200 lb of ground grain per ton when direct-cutting rather than wilting to 60-65% moisture.

Stems are not very palatable, and if animals have the opportunity, they will sort them out. Chopping hay and feeding it in a total mixed ration (TMR) will help prevent sorting, and stretch forage supplies.

If soybean forage contains substantial amounts of developed beans, reduce the amounts of other fats and oils in the ration, or the ration may be too laxative. Also, it may be difficult to dry down pods for hay if beans are too well developed. Soybeans can be pastured. If cows are removed before all stems are eaten, there may be re-growth.

The table below gives some estimates of the nutrient content of soybean forage on a dry matter basis:

Expected Nutrient Content of Soybean Forage:

Stage of Maturity	CP %	ADF %	Nel	Ca %	P%	Mg %
Avg. silage, hay	17.7	35	.54	1.25	.49	.34
Avg. hay	16.5	35	.55	1.20	.47	.32
Mid bloom	17.8	35	.57	1.25	.49	.34
Seed developing	17.5	35	.59	1.20	.47	.32
Seed dough stage	16.8	35	.61	1.15	.45	.30

The dry matter content for average silage is 28%, while that for hay is 88%. Test soybean forage or mixed forages containing soybeans to enable proper ration balancing.

Precautionary note:

You need to consider some of the herbicide restrictions. Unfortunately with few exceptions, most soybean herbicides do not allow feeding the soybean plant as forage there are exceptions. I suspect that the reason that most of the newer herbicides don't allow this use is because the ingredients simply never received a forage tolerance. Soybeans are not typically harvested as forage and it costs the manufacturer a great deal of money to conduct tolerance/residue studies. Think about how few products we have labeled on alfalfa. Although this explanation may not help, it's what on the product use label.
Source: R S. Adams, Emeritus Professor of Dairy Science, Penn State University

Forage Testing laboratories in the Maryland Area
A&L Labs
7621 Whitepine Road
Richmond, VA 23237
1804-743-9401

Eastern Laboratory Service Associates
517 N. George Street
York, PA 17404
1-717-846-4953

Penfield Feeds
805 Rohrerstown Road
Lancaster, PA 17601
1-717-295-8748 or 1-800-995-0333 (outside PA
(Ask for Lab)

Cumberland Valley Analytical Services
14515 Industry Drive
Hagerstown, MD 21742
301-790-1980

Harvesting Drought Stressed Corn
Many parts of the region are experiencing drought conditions. Here are some guidelines for dealing with this situation.

Drought stressed corn should be harvested at the same dry matter (DM) for normal corn: 32-35% DM. ***Determining whole plant dry matter or moisture is critical because visual assessments can be very inaccurate! Many plants that look dry contain a significant amount of moisture in the stalk.*** Use of a microwave oven or Koster Moisture Tester is recommended. Under hot dry conditions, plants may dry down at 1-2 points per day. Ensiling corn at less than 28-30% DM will result in excess nutrient runoff and extremely acidic silages. Harvesting corn too dry (greater than 40% DM) restricts fermentation, reduces the loss of nitrates, results in forage that is difficult to pack, and can result in excessive spoilage and poor bunk stability.

Chop forage at a theoretical setting of 3/8 to 3/4 inch if harvested at the optimum DM. If you have already missed the optimum dry matter for harvest and the plants are very dry, (more than 40% DM) consider, chopping your forage finer to improve packing (but remember you will have to balance the TMR for adequate effective fiber during feedout).

If the forage is not well eared, mechanical processing may not be needed. Process if the amount and maturity of the kernels warrants it.
As always, filling fast, packing tight and sealing immediately will help to ensure a good fermentation. Be sure to have adequate tractor weight on the pile as drier forages are more difficult to pack. Allow silage to ferment for at least 3-4 weeks (longer would be preferable) prior to feeding and gradually introduce new silage to animals.

Silage Additives for Drought Stressed Corn
Homolactic acid bacteria (microbial inoculants): Severely drought stressed corn forage may contain lower numbers of naturally occurring lactic acid bacteria and may need some help during fermentation. If forage is in the normal range for DM, consider using a homolactic acid bacteria. Some strains of *Lactobacillus plantarum* may help with the reduction in nitrates.

Heterolactic acid bacteria – *Lactobacillus buchneri*: Drought stressed corn silage often has a high sugar content and can be highly prone to spoilage when exposed to air. *Lactobacillus buchneri* is an organism that safely produces acetic acid, which reduces aerobic spoilage organisms and improves bunk life.

Buffered propionic acid-based preservatives: Silage additives based on buffered propionic acid may be an acceptable additive for drought stressed forage especially if the DM% of the whole plant is high: greater than 38 - 40%. Addition of 2-4 lb./ton of such products per ton of wet forage can improve aerobic stability of the silage and reduce DM losses in the silo and during feedout. Higher application rates will increase the

probability of effectiveness. Although this may seem costly, such preservation easily pays for itself by preventing drops in intake and milk production that would occur if cows were fed spoiled silage.

Water: Water can be added to increase the moisture level of overly dry forage, but the amounts needed to have a substantial impact are large. For example to decrease the dry matter of forage at 50% to 45%, one would have to add 200 lb of water per ton of forage! In addition, added water can cause run off problems as it is not absorbed efficiently by the forage mass.

Sugars/molasses: Drought stressed corn forage usually contains moderately high concentrations of fermentable sugars. Thus, the addition of molasses or other fermentable substrates is usually not warranted if the forage is harvested at the proper DM content.

Non protein nitrogen additives: Non protein nitrogen (NPN) additives (urea and anhydrous ammonia) should not be used on very dry, drought stressed forages.

Nitrate Poisoning From Drought Stressed Forages

Many plants can accumulate nitrate under stressful conditions (excessive fertilization or water stress from rain after a drought). Sunflowers, corn, wheat, barley, rape, bromegrass, and sweet clover are some of the more common plants that can accumulate high levels of nitrates. High nitrates cause toxicity because once they

are absorbed into the blood stream, they are converted to nitrites that binds to hemoglobin and reduces the oxygen carrying capacity of the blood. Acute poisoning can be observed within 6 hours of forage consumption and is characterized by dark-brown blood, labored breathing, tremors, and weakness. The following information is primarily aimed at the management of drought stressed corn silage but general concepts are valid for other forages as well.

- Do not graze or feed green chopped forages that have been drought stressed.
- Ensiling is the best method to manage forages with potentially high levels of nitrates.
- Wait at least 4 to 5 days before chopping drought stressed forage if it is heavily rained on.
- Although extremely high nitrate levels are rare, we recommend that you test your corn forage before chopping and after ensiling (before feeding).

Test for nitrates at chopping: If the levels of nitrates are extremely high (Table 1) you may want to raise your cutter bar during harvest and leave about 10-12 inches of stalk in the field (this is because nitrates tend to accumulate in the stalk of the plant). We realize this will further lower yields, but high yields with toxic levels of nitrates are undesirable.

When sending samples into the lab, you must obtain representative samples from the field. It is best if this material is chopped. (Do not send in large pieces of plants and stalks.) Labs like Cumberland Valley Analytical, UPS/FEDEX: 14515 Industry Drive, Hagerstown, MD 21742 Phone: 1-800-282-7522 can return results of a nitrate test back to you within a 24 h period.

Test for nitrates before feedout: Although ensiling will decrease nitrate levels by about 50 to 60% we would recommend that you test your drought stressed corn silage feed according to the guidelines (Table 1). If nitrate levels are high in feeds, check for nitrates and nitrites in water as these can also contribute to toxicity issues.

Table 1. Safe and toxic nitrate (NO_3) levels in feeds.

Nitrate ion, % dry matter basis	Recommendations
0 – 0.44	Safe to feed.
0.45 – 0.88	Usually safe to feed with balanced diet. Limit to 50% of DM intake in pregnant animals.
0.89 – 1.50	Limit intake to 20-25% of DM intake. Use caution. Do not feed to pregnant animals.
> 1.50	Toxic!

Silo Gas Caution

Use extreme caution around silos because nitrogen oxide gasses that are generated during the first few days of ensiling are lethal to animals and humans! These gasses tend to accumulate in low areas and are colorless to reddish-brown. Run the blower for 15 to 20 minutes before entering an upright silo and use caution around vents in silo bags. Use a respirator before entering a silo. In severe cases, the gasses will stain forages and other items. In some instances patches of yellowish silage may be observed. If these spots of silage have a very low pH (1 - 3) it is possible that nitric acid was formed.

Maryland Farmers Can Chop or Graze Cover Crops to Provide Livestock Feed During Drought

The Maryland Department of Agriculture reminds farmers participating in the 2007-2008 Traditional Winter Cover Crop Program that they may graze their

livestock in cover crop fields or cut and bale the crop for winter hay once the cover crop is fully established.

Cover crops are widely recognized as one of the most cost-effective and environmentally promising ways to absorb unused nitrogen and control soil erosion in order to reduce potential nutrient impacts to the Chesapeake Bay and its tributaries during winter. The Maryland Agricultural Water Quality Cost-Share (MACS) Program provides grants to farmers who plant cover crops of rye, wheat and barley in the fall to slow down rainwater runoff and absorb any nutrients remaining in the soil from the previous summer crop. Cover crops become even more important in drought years when withering summer crops may not use all the nutrients available to them.

For a second year, MDA is providing a Commodity Cover Crop Program for farmers who want to harvest their cover crop. The Commodity program option is in addition to the Traditional Cover Crop Program which does not allow for harvest and provides stronger incentives to plant cover crops for their environmental and soil quality benefits. The use of manure and commercial fertilizer is restricted under both programs.

A record $8.2 million was made available in this year's budget for the cover crop program. For more information, farmers should contact their local soil conservation district or the Maryland Agricultural Water Quality Cost-Share (MACS) program at 410-841-5864.
Source: MDA Press Release, July 26, 2007

Manage the Plastic on Your Silage Piles and Bunkers
The primary purpose of covering silage with plastic and tires is to prevent air from interacting with the silage mass. Air allows for the growth of detrimental microbes that initiate a process leading to the destructing of nutrients and potential for increased loads of various some practices that have been used. During feedout, try to minimize the time that the top layer of silage is exposed to air (especially in hot weather) by cutting back only enough plastic to expose 1 to 2 days worth of feeding. This needs to be balanced with safety. Silage on the top of bunkers and piles is less tightly packed and prone to "cave ins" so use common sense and caution when deciding how much plastic to cut. It is also extremely important that the plastic at the leading edge of the feeding face be securely weighted down. Think of this edge as another "seam". Use of heavier tires, split tires stacked 3 or 4 high (Figure 3) or gravel bags at this edge (Figure 4) will prevent air from penetrating under the plastic. We have found gravel bags work well since they can be rolled back prior to cutting the plastic. Start toxins. Although bunker and pile silos are covered with "plastic and tires", often times their management is less than desirable. Several scenarios are common. First, inadequate amounts of tires are used and/or the amount of weight provided by the tires (because they are sidewalls only) is insufficient to keep air from penetrating under the plastic. Billowing plastic or plastic that "ripples" is a good sign of this. Next, plastic is often torn from natural causes, equipment or animals and not repaired. Another common problem is that plastic is often cut in advance, too far back from the leading edge of the feeding face. This exposes the surface of the silage to air for too many days before feeding. Lastly, sidewall plastic has been used to help prevent water seepage into the silage mass but often times the silage is damaged by pack tractors or there is potential that the plastic is damaged with small holes as it lies on the wall during filling (plastic can be scraped on the sharp edges of a concrete wall as the plastic moves during filling).

To use the plastic and tires effectively we suggest the following. First, silos should be sealed with plastic and good weights as soon as possible after filling. This eliminates air and allows fermentation to proceed. Use more weights at the edges and at any seams. For example, use of whole tires, gravel bags, lime, or dirt around the perimeter of piles works well. Gravel bags have worked well at the walls (Figure 1). Overlap the plastic by about 4 to 5 ft at any major seam. Some people have actually glued or taped these seams together as they are lying the tarp down to keep them in place during sealing. If you are using plastic on the side walls, protect the draped plastic from being damaged by the sharp edges of the concrete wall. Placing thin strips of old carpet or cutting a ribbed plastic drain pipe down the center and fitting it on top of the wall (Figure 2) are

the heavier weights at this leading edge as soon as possible after opening the silo. Once a significant amount of air has been trapped under the plastic, placing heavier weights at that edge will trap some of that air under the plastic. Lastly, repair rips and holes in plastic as soon as possible. Assign someone to check for tears at least once to twice a week. The use of alcohol around the perimeter of the rip, to dry the plastic, and tape specifically for repairing bunker or bag plastic will work better than duct tape. Remember, the primary cause of hot, moldy silages and spoilage layers on the tops of silos is due to exposure to air. Thus, minimize this exposure by managing your plastic and weights effectively.

Figure 1. Gravel bags at the wall in a bunker silo.

Figure 2. Plastic drain pipe used to cover the top of the wall to prevent side wall plastic from being torn or punctured.

Figure 3. Split tires stacked at the feeding face to prevent air from penetrating under the plastic.

Figure 4. Gravel bags at the feeding face to prevent air from penetrating under the plastic.

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