OSU Sheep Team Newsletter

June, 2007

The OSU Sheep Team Newsletter is a quarterly newsletter produced electronically by the OSU Sheep Team, comprised of OSU/OARDC faculty and staff, Extension Agents, and industry representatives.

In This Issue...

A) OHIO SHEEP DAY - JULY 14, 2007 AT OARDC WOOSTER

Mark your calendars, NOW! Ohio Sheep Day will be held on Saturday, July 14, 2007 at the OARDC Sheep Research Unit, 5651 Fredericksburg Rd., Wooster, OH 44691. We are once again in the planning stages for our fourth field day in a row, after the successes of the past three years, sheep producers should once again clear their calendars and be ready to attend another great program in 2007. The Ohio Sheep Day program is designed to bring producers to a successful sheep production farm to see what they are doing to be successful and deliver good technical information to the sheep producers in a field day scenario. Producers need to be able to see and possibly experience many of the things that make their production systems more efficient and even more profitable.

The Ohio Agricultural Research and Development Center, commonly known as OARDC Wooster has been the backdrop of Ohio Sheep Days over the past several decades. The last Ohio Sheep Day held at the OARDC Wooster Facility was in 2000. The OARDC Sheep Research Facility is a part of The Ohio State University Animal Sciences Department and is the primary facility where sheep research takes place in the State of Ohio. Many sheep research projects have taken place at this facility for many years. The Ohio Sheep Industry is ready to go back to our research facility to see what they have been doing over the past several years to progress sheep and livestock production in the State of Ohio states Roger A. High, Sheep Extension Associate at The Ohio State University and Executive Director of the Ohio Sheep Improvement Association. We are very pleased to be able to come back to this research facility and catch up on what has been going on in the area of sheep research. The research focus for the past several years has been in the areas of sheep and livestock nutrition, with several other projects in many other areas as well. We think you will find that the researchers are really doing some great work with the sheep facility at OARDC Wooster.

Hopefully, the sheep producers can come to this program and get some great ideas about Sheep nutrition, sheep management systems as well as many other areas of sheep production. The program will focus on several areas of sheep production from sheep nutrition to ram breeding evaluation to predator management.

We look forward to seeing many sheep producers at the Ohio Sheep Day; it will hopefully be a day of learning and gathering with other sheep friends. If you have any questions regarding Ohio Sheep Day activities, please contact Roger A. High at (614) 292-0589 or by email at high.1@osu,edu. More Ohio Sheep Day information can be found on the Ohio Sheep Improvement Association's website at www.ohiosheep.org. A lamb luncheon is included as part as registration for the Ohio Sheep Day event.

B) OHIO FORAGE AND GRASSLAND COUNCIL SHEEP FARM BUS TOUR

The sheep grazing tour is July 13, 2007 and we will meet at 9:30 a.m. at OARDC, Fisher Auditorium, 1680 Madison Ave., Wooster, OH 44691 north parking lot to board the bus. There are three sheep farms on the tour. One farm is an intensively grazed farm with permanent pastures and recent building. The second farm has intensive grazing and using annuals along with permanent pastures. The final farm is a commercial forage producer along with their sheep operation. This tour is co-sponsored by Ohio Forage and Grasslands Council, Small Farm Institute and the Ohio Sheep Improvement Association. Registration needed for this tour. It is all day and includes lunch and transportation. For more information, contact Leah Miller at 740.545.6349.

C) GRAZING MANAGEMENT IN DRY TIMES - Jeff McCutcheon, Extension Educator, Knox County

Graziers with whom I have the privilege to work are concerned. Many are reporting 0.4 total rain for the month of May and the average temperature 10 degrees hotter than normal. This translates into grass growth slowing and even stopping, right in the peak production period for our cool season pastures. What is a grazier to do? Relax. Remember, we have been here before, dry periods are expected, but not enjoyed. Check out drought information published in 2002, http://corn.osu.edu/drought02/ if you dont believe me. Of course, if you just started managing grazing in the last two wet years, consider this a crucial part of your education. Many experienced graziers refer to it as the school of hard knocks.

Rotations need to slow down. Grass is growing slower, it takes longer to start regrowth after being grazed and it takes longer to reach optimum grazing mass (height) for the next grazing. The number of days grazing a paddock can be increased, as long as you do not over graze. The rest period needs to increase. For most graziers this means pulling more acreage into the rotation. Many use fields where they made first cutting hay. Another consideration is unused fields in your area. Every year I get calls from landowners looking for producers to mow their fields and take all the hay. They just want it mowed. Check around, many of these could easily be grazed.

Every grazier works to protect their perennial forage resource. Do not overgraze! Overgrazing is something we try to avoid in normal years, but critical in dry ones. Overgrazing during a drought can cause slower recovery when we do get rain, reduced productivity even longer after recovery and can cause stand loss.

During dry periods we need to be extremely protective of our residual. Residual is the term used for the amount of green forage left after grazing. Residual is an important aspect of managing grazing. In a dry year it becomes even more critical. The amount of residual has an effect on many things.

The amount of residual affects root growth. Many of you have seen the study from 1955 on leaf area removal and root growth. This data showed that at 50% leaf removal only 2% of the roots stopped growing. At 60% leaf removal 50% of the roots stopped growing. All of the roots stopped growing at 80% leaf removal. A healthy root system helps the plants survive the dry times. If more than 50% of the leaf area is removed then root growth stops. Root growth is used to capture more water and nutrients. At the very least this slows re-growth.

The amount of residual affects re-growth. Green leaves are needed to capture sunlight for photosynthesis. This creates the non-structural carbohydrates needed to fuel re-growth. Without enough leaf area the forages must fuel re-growth from their stored reserves. Growth fueled by the root reserves is slower than growth fueled from active photosynthesis.

The amount of residual affects water absorption by the soil. Grazing below 1200-1500 lbs./DM per acre or 2-3 will allow most of the rain that does come to run off and not be absorbed by the soil. A classic forage study from the 1930's shows the runoff results from a 10% slope where three inches of rain was applied through a sprinkler system over 90 minutes. Pasture grazed to 95% cover experienced a little over 10% runoff. Overgrazed pasture, 50% ground cover, lost 75% of the rain that was applied.

More leaf area means less water runoff. The more vegetative material you have will shade the soil and slow the movement of rain allowing the water to be absorbed by the soil.

When we consider grazing management during dry times remember that without rain pastures grow slower, and close grazing will compound the problem. Slow growth means the rest between grazing needs to be longer. Do not take more residual to allow for this rest. It may get to the point where you need to consider other options, like annual forages, supplemental feeding, and even penning the animals up and feeding them. If growth stops, the worst option would be to open up all of the gates letting animals overgraze the whole farm. Dry-lotting them may be the best option.

D) SUMMER ANNUALS FOR GRAZING - Jeff McCutcheon, Extension Educator, Knox County

It is the first of June and grass growth has slowed or stopped. You are grazing through your fields and considering your options. One option to consider is planting summer annuals for grazing in mid to late July.

If there is any land not planted in corn, we could still plant something that could be grazed in 45-60 days. Of course corn is a grass and could be grazed but that is a whole different subject. What options are there?

According to the Ohio Agronomy Guide, http://ohioline.osu.edu/b472/0008.html, we have the options of Sudangrass, Sorghum Sudangrass and Millet.

Sudangrass is a fine-stemmed, leafy summer annual grass that can grow between three to eight-feet tall. It will regrow after grazing until a killing frost. Sudangrass usually contains lower levels of prussic acid and is usually lower yielding than the other sorghum family grasses. Do not feed to horses.

Sorghum-Sudangrass is a hybrid cross, although there are multiple varieties available. They resemble Sudangrass, but are generally taller, have larger stems and leaves, and are higher yielding. Sorghum-Sudangrass hybrids regrow after each grazing with proper environmental conditions. These can contain prussic acid. Brown mid rib varieties have shown higher animal preference and performance. Do not feed to horses.

Pearl Millet does not produce prussic acid. It tends to have smaller stems and more leaf than the Sorghum grasses. Pearl Millet regrows after each harvest, but not as rapidly as Sudangrass or Sorghum-Sudangrass hybrids.

Fertilize all three according to soil test results similar to corn with a target of 100-150 bu. They can be no-tilled or broadcast into a prepared seed bed. Plant each at a rate between 25-30 lbs. to the acre. All of these summer annual grasses can be grazed or even cut for silage. These summer annuals should be grazed after they are 18-inches tall. Grazing earlier has concerns with prussic acid and will weaken the plants. Trampling and wastage will increase when grazing is delayed past the boot stage. Plants reach the grazeable height of 18 to 30 inches about six to eight weeks after planting. Rotational grazing or strip grazing management should be practiced. A high stocking density should be used to graze the grass down in less than 10 days. Clipping leftover stems down to 8 inches will improve forage quality for the next grazing period.

Another summer annual not mentioned in the Agronomy Guide is Teff. Teff is a summer annual grass from Ethiopia. It can grow well in low moisture conditions. It is a fine stem grass that can be grazed in about 50 days and re-grazed about 45 days after the first grazing. Plant it at a rate of 4-5 lbs. to the acre. Use 50 lbs. nitrogen as a starter. Check out the factsheet from Cornell University for more information.
http://nmsp.css.cornell.edu/publications/factsheets/factsheet24.pdf

E) WEEDS AND WORMS: MANAGING CHEMICAL RESISTANCE - William Shulaw, Extension Veterinarian, The Ohio State University

Recently an article on the detection of glyphosate resistance in giant ragweed in a neighboring state was sent by email to many of us in OSU Extension. Glyphosate is the active ingredient of Roundup and several other products now on the market. It has been, and remains, an extremely useful herbicide for farmers, gardeners, and homeowners. The article discussed how resistance to a chemical like this develops and ways to both manage resistant weeds and to reduce the potential for resistance occurring on farms. This was the most recent of several articles I have read on glyphosate-resistant weeds, and they have reminded me of the similarities with development of worms that are resistant to anthelmintics (dewormers) in sheep and goats. Perhaps quotes from this article can help us understand a little about parasite biology and prevention and management of resistance:

* **"Glyphosate-resistant giant ragweed was found in one county last year, but as of this spring, resistant varieties are now located in at least 10 counties. The rapid-growing weed has the ability to significantly reduce yields, and because varieties resistant to glyphosate are becoming more common, it's going to become increasingly difficult to manage for growers."** Anthelmintic resistant worms are a global problem and are being increasingly diagnosed in US sheep and goat operations.

* **"One of the reasons why Roundup Ready technology is so popular is because when glyphosate - the active ingredient in Roundup - was developed, it was very affective against giant ragweed and the only economical tool for managing ALS-resistant giant ragweed," he said. "Now that the weed is developing resistance to glyphosate, we currently have very few options to deal with it."** The first really modern chemical dewormer class to be introduced was thiabendazole in the early 1960s. By 1964 the first reports of resistant worms in sheep had already been published. Then came levamisole in the early 1970s and resistant worms were reported by 1979. Ivermectin was introduced to the world in 1981 and reports of resistance were already being published by 1988. The ivermectin-containing product approved for sheep was introduced in the US in the early 1990s and reports of resistance in goats in Texas were presented within a year indicating that widespread use of ivermectin-containing products approved for other species had probably created this situation. These new products were much more effective than phenothiazine, and the older, more dangerous compounds like nicotine, and producers welcomed them because they made the job of controlling internal parasites simpler and cost effective. Routine use also allowed the maximum effects of genetics and nutrition to be achieved. For years, producers had a new chemical class each decade to replace the older ones that had become less effective.

* **"No new herbicide modes of action have been introduced in the last 25 years and there are no new ones in the pipeline.** " Parasitologists are telling us that the situation for sheep and goats is essentially the same. We can no longer rely heavily on chemical dewormers for control of parasitism.

* **"We suggest using at least two tactics or herbicides for dealing with the most troublesome weeds" "Reliance on one chemical helps weeds develop resistance and also lessens the odds that your weed-management efforts will be effective for the entire season."** Frequent exposure to the same chemical is the most common reason for development of resistant worms. This puts selection pressure on the worm population and favors survival of worms that may be genetically resistant. Although the proportion of genetically resistant worms in a flock may be very small compared to the overall worm population, it can be selected for just as we select for certain production traits. Parasitologists are now questioning whether strategies for rotating among the classes of dewormers are beneficial, but there is NO question that the frequent use of dewormers, especially when they are administered to ALL animals, is a very powerful selection force for resistance. The practice of routinely deworming all animals at monthly intervals is a recipe for selecting resistant worms.

* **"This summer a multidisciplinary team of researchers and Extension specialists will try experiments in some 20 to 30 counties to determine best practices in weed management. The strategies will include use of different herbicides, sprayer application factors, and learning more about the genetics of resistance."** Although resistance genetics in worm species are incompletely understood, some researchers believe that ivermectin resistance in *Haemonchus contortus*, possibly the most important worm we have to worry about in Ohio, is a dominant trait. Practically speaking, this means that not only is a female worm with one copy of the gene resistant, but more importantly, half of the 3000-5000 eggs she produces daily will produce resistant progeny no matter the genotype of the male worm she mates with. If she is homozygous for the trait (has two copies of the gene) all her progeny will be resistant. The situation appears to be different for levamisole, where resistance in *H. contortus* is a believed to be a recessive trait. If this is correct, two copies of the gene are needed for a worm to be clinically resistant to levamisole. This may explain why levamisole resistance appears to be less common in sheep and goat flocks than ivermectin resistance; it is harder to select for.

Regarding management and prevention of glyphosate-resistant ragweeds, the article highlights some recommendations that also have similarities with recommendations for management of resistant worms.

"In the meantime, some good rules of thumb regarding glyphosate use for weed control include:"

* **"Applying the correct rate of glyphosate based on weed size."** Another important factor in selecting for resistant worms is under dosing dewormers. Under dosing frequently happens when animals are dosed according to an average weight for the group. Effectively, this under doses half the animals. Dewormers should be dosed according to an accurate body weight if possible. Ivermectin drench and the benzimidazoles (Valbazen in sheep and Safeguard in goats) can probably be given safely when dosed for the heaviest animal in the group, provided there arent wide extremes, but levamisole should be more accurately dosed as there is a more narrow safety margin. Other ways dewormers may be under dosed include, incorrectly calculating the volume to use; incorrectly diluting products that must be mixed with water (levamisole drenches); and using equipment that is not calibrated, or faulty, such that the correct amount isnt delivered. Equipment should be checked every time it is used to be sure that it is delivering the correct amount of product. This can be easily done by checking the delivered amount with an old plastic syringe with the plunger removed.

* "**Starting with a clean field."** Strive to use pastures that have low levels of worm larvae for animals that are at greatest risk of severe parasitism such as lactating females and weaned lambs. It is especially helpful to turn lactating ewes into a clean pasture after the lambs are about two weeks old. They are the main source of worm larvae for their lambs, and the periparturient rise in egg counts in ewes lasts about 4-8 weeks after lambing. Moving to a clean pasture when the lambs are relatively small helps reduce exposure to both. Moving weaned lambs to clean pastures such as spring seeded annuals, hayfield re-growth, or pastures previously grazed by cattle, provides them some protection against heavy challenge for at least three weeks and possibly 8-9 weeks depending on their age and previous exposure. However, it is NOT a good idea to deworm ALL the animals and then move directly to a clean pasture because that approach takes only survivors of the treatment to the clean pasture and fosters selection for resistance. Selectively deworming individual animals using the FAMACHA technique, or deworming only thin animals, allows animals harboring small numbers of non-selected worms to seed the new pasture and reduces the rate at which resistance develops. Alternatively, deworming could be done a few days after the move which would allow pasture seeding with worm larvae that had not had the chemical exposure.

* "**just because a weed does not seem to be affected by glyphosate does not mean that it's resistant."** If deworming did not appear successful, logical questions to be asked are: Was the dewormer properly diluted and administered?; Was the equipment properly calibrated to deliver the correct dose? In addition, use of a dewormer when the pasture is heavily contaminated may lead to the conclusion that the drug was ineffective when the real reason was that the animals become heavily re-infected shortly after dosing. Under such pasture

conditions, it is not uncommon for losses to continue in spite of effective treatment. In these cases, the animals are only helped by moving them off the heavily contaminated pasture.

* "**There are also some weeds that have a natural or inherent tolerance to glyphosate, such as velvetleaf."** If you are seeing worms in the feces, they are possibly tapeworm segments. Tapeworms are not affected by ivermectin and levamisole but fortunately, they are not a significant source of loss for most sheep producers. The important worms like *Haemonchus* are not visible in the manure.

The weed article continues, "**If weeds continue to crop up, there are many factors that producers can check in order to determine if resistance is a problem in their field. Those include:"**

* "**Noting whether rain could have washed the herbicide away prior to plants absorbing it."** Relevant questions for the sheep producer might include: Did the sheep spit it out? This is especially applicable if a bolus form of dewormer was used, but careful administration of drenches is also important to be sure the animal got the full dose. Was the dewormer properly administered? Current recommendations for drenches are to be sure to place the dewormer in the back of the mouth as this helps insure that the drug goes into the rumen. If it is deposited in the forward portion of the mouth, it is possible that much of the drug will end up in the abomasum and the drug will be less effective than it should be.

* "**Determine if only one species seems unaffected but all other [weed] species in a field are controlled."** It is critical that producers KNOW that the dewormer they are using is effective to avoid disasters. Currently the only ways to do that are by conducting a fecal egg count reduction test with their veterinarian or by utilizing the services of the University of Georgias veterinary parasitology laboratory which performs a larval development assay to test for dewormer resistance http://scsrpc.org/SCSRPC/Files/Files/D'Rite%20Scsrpc11-05.pdf . They should realize that if these tests are conducted in mid-summer, *Haemonchus* egg output may completely overshadow that of other worms making it difficult to determine whether the other worm species are also resistant. This may not be critical for many flocks whose main problem is with the blood feeding *Haemonchus*, but could be relevant in some parts of the US.

* "**Finding out if other farmers in the area are experiencing similar problems."** Whether or not your neighbor has drug resistant parasites in his sheep is not important for you find out unless you bought your sheep (or goats) from your neighbor! Resistance genes for dewormers are widespread in parasites in sheep and goat populations although in many flocks their prevalence has not yet reached the critical level where dewormers are completely ineffective. However, purchase of new animals is a common way to introduce resistance genes. If producers are purchasing replacement animals, they should isolate them in a barn or dry lot where worm eggs from resistant worms cannot contaminate pastures where the home flock will graze. Ideally, fecal samples for quantitative egg counts should be taken at the beginning of a quarantine period, and the new arrivals should be dewormed with at least two of the three chemical classes of dewormers. Fourteen days later, fecal egg counts should again be done to determine whether resistance might be present and whether significant egg shedding is still occurring before these animals are allowed to graze the pastures.

The article also refers to the use of soil-applied residual herbicides to help in the control of glyphosate-resistant ragweed. Unfortunately, there are currently no treatments farmers can apply to soil or pasture that have been shown to control parasites. However, research has demonstrated the feasibility of using a special type of fungus which traps and kills worm larvae as they hatch from the egg. An Australian company has expressed interest in commercially marketing such a product but it is not yet available.

Sustainable parasite control, like weed control, requires knowledge of biologic principles and an integrated approach using several strategies. For some producers, this may seem too complicated or overwhelming. It doesnt have to be. Most producers can use more than one strategy and reduce their reliance on chemical dewormers. Consult your veterinarian or members of the Sheep Team to discuss possible options you might use.

F) SHEEP MANAGEMENT TIPS - SUMMER 2007
- Roger A. High, State Sheep Extension Associate, Sheep Specialist, The Ohio State University

General Management - Keys to Summer Sheep Management

1) The average sheep will consume 2 to 4 gallons of fresh, clean water per day, depending on temperature, humidity, and protection from the sun.
2) Shade can be provided in the form of shelters, barns, trees, and the fleece of the sheep can provide adequate protection from the sun to protect the sheep if shelter is unavailable. It is not recommended to have completely shorn sheep without shade as they will sunburn and have no protection from the sun.
3) Maintain an adequate diet of forages and concentrates as necessary to maintain the ewes Body Condition Score (BCS), this BCS will need to change based upon the climate and the production state of the ewe.
4) Provide adequate amounts of Sheep Free Choice Mineral with Selenium to prevent mineral deficiencies.
5) Be cautious of poisonous plant, as many plants are more poisonous during drought conditions.
    a. Grazing Sudangrass or Sorghum – Sudangrass crosses can lead to nitrate or prussic acid poisoning
    b. Do not force sheep to eat weeks as the only sources of nutrition. Examples include Curly Dock, Lambsquarters, and Burdock

Health

Urinary Calculi
Urinary Calculi, also known as kidney stones or bladder stones is a common problem with older rams and young lambs at this time of the year. The blockage generally occurs in the urethra and the lamb is unable to pass these calculi through the urethra. Urinary Calculi is most common in castrated males. Prevention is usually accomplished by feeding 0.5% ammonium chloride or ammonium sulfate in the complete diet. Avoid feeding high quality legumes. It is also helpful to have a Ca:P ratio of 2:1 in the lambs diet.   In many cases, if adequate salt and mineral mix with ammonium chloride is provided to the rams or wethers with adequate sources of fresh, clean water, the problem can be entirely avoided. Treatment is difficult and costly. Urinary calculi can be a problem with both sheep and goats.

Foot rot Prevention and Treatment
Watch of indications of foot rot in both ewes and lambs. The best preventative measures for treatment is the keep sheep and lambs out of muddy areas where the foot rot bacteria (Bacteroides nodosus and Fusobacterium necrophorum) are most likely to reside. Both bacteria must be present for foot rot to occur, foot rot will not occur if only one of these bacteria is present in the environment.   It is also recommended that a 10% zinc sulfate mixture (8 lbs. zinc sulfate/10 gallons water), 1-2 inches deep be set up between pasture and water supply. Also, keep feet well trimmed. There are also vaccination treatments available as another aid in the prevention and treatment for foot rot that seem to work very well. The most popular vaccination on the market is called New Zealand Footvax, and it can be obtained at many sheep supply companies.

Monthly Management Tips for Grazing Flocks
Over the next several quarterly OSU Sheep Team Newsletters, I will be providing a series called Monthly Management Tips for Grazing Flocks, this is information that was put together by a number of sheep grazing managers over the past several years. Of course, there are going to be some things that you do differently, but these are some basics that might help you manage your grazing flock better.

May and June (lacation) Nutrition: Rotate pastures to allow for 10-21 days rest between grazing, weather dependent. Graze hard early, to keep forages from getting to mature, especially the grass species. Back fence and make hay or balage early off of ungrazed pastures. Enter pastures at heights of six to eight inches and remove to two to four inches. Use the flock much like a lawn mower to prevent grasses from entering their reproductive (seed) phase. Pay attention to rest time between grazing. Allow no more than three days grazing in a paddock followed by the appropriate amount of rest. Three days in a paddock is ideal and practical for most producers. Exceeding three days of grazing can damage pasture growth.

July and August (lactation) Nutrition: Depending on rainfall and temperature, grazing rotation will extend from 20 days to as much as 40 days rest between grazing. Weaning and Deworming: Wean lambs at 90 days, deworm lambs and put the lambs on a clean pasture (regrowth hay field) or allow to remain on ewes if separation is a management problem. Health: Watch for diarrhea and smeary buts as evidence of internal parasites or coccidia for those lambs left on pasture. Marketing: Check the market, you may want to sort a truck or trailer load of heavy lambs off of the pasture and feed out to create some cash flow. Feed lambs on good quality alfalfa and shelled corn or a commercial corn/35% protein supplement mixture. Health of lambs in feedlot: Booster with overeating vaccines and deworm these lambs (Vabazen or Panacur for tapeworms). Nutrition of lambs in feedlot: Adjust slowly to grain (two to three weeks). To prevent urinary calculi, dont exceed a 50/50 corn/hay mix of feed and feed a 2:1 Ca:P ratio balanced commercial 35% lamb supplement pellet or shelled corn. Usually lambs will finish nicely on about 2 lbs. shelled corn and 2 lbs. of good alfalfa hay or the commercial pellet or shelled corn mix. The lambs should gain 0.5 to 0.7 pounds per day. Thus 80 lbs. lambs should weight about 120 pounds in 60-80 days.

G) PASTURE FERTILIZER COSTS - Clif Little, OSU Extension Guernsey County

Are you wondering how much to invest in fertilizer this year? We will soon be approaching the period of the forage growing season critical for stockpiling pastures. Will it pay to purchase fifty units of nitrogen this August? In order to make this decision forage producers should be able to answer a few logical questions in regards to forage growth and economics.

As we approach the summer slump, it may be important to recognize that the majority of forage production from cool-season grasses has already occurred. Normally we do get a needed burst of forage growth in the fall. How much extra growth can we cause to occur in a cool-season grass this fall with the addition of fifty units of nitrogen? Many studies have found that under good growing conditions, fifty units of nitrogen can yield an additional 2000 pounds of dry matter (DM) per acre. If this is true how much did the 2000 pounds of dry matter cost?

Let us consider the following fertilizer scenario, the conditions are:
Purchase and spread 50 units of actual nitrogen per acre to a fescue field for winter stockpiling.
Spreading cost is $6 per ton.
The application is expected to yield 2000 pounds of DM per acre of additional forage.
Our fertilizer will be urea and cost $400 per ton.
The value of like forage is $50 per ton of DM.

Calculations; we need 50 (units of actual N) divided by .46 (% nitrogen in urea) = approximately, 108 lbs of fertilizer per acre. The fertilizer cost $400 divided by 2000 lbs = $.20 per pound X 108 = $21.60 per acre plus spreading cost. The actual spreading cost at $6 per ton is approximately $.32 per acre. For our purposes, we will round our cost to $22.00 per acre. Therefore, we have a $50 - $22 = $28 per acre net profit. As with all farming practices, there is a risk and we may not see any additional forage form this application of nitrogen.

From these calculations, our net profit is highly influenced by the value we put on the grass produced. What price do you place on the forage you produce?

H) WINTER GRAZING SYSTEMS FOR GESTATING EWES

S. C. Loerch, D. D. Clevenger, G. D. Lowe, and P. A. Tirabasso, Animal Sciences Department,
Ohio Agricultural Research and Development Center, The Ohio State University, Wooster

Feed costs represent approximately two-thirds of all production costs for a sheep enterprise (Umberger, 1996). More than half of all feed costs are expended during the winter to provide harvested winter feed to the flock (Rayburn, 2000). Traditionally, producers feed hay to ewes when grass is not available. Hay is an expensive source of feed to meet caloric requirements (Loerch, 1996). Stock-piled forage that is set aside for winter grazing offers some potential to reduce hay needs and reduce winter feed costs (Loerch, 2003). However, the availability and yield of stock-piled forages is compromised by weathering as well as snow and ice cover. Grazing standing corn may provide an opportunity to reduce winter feed costs and meet the nutrient requirements of the flock. More than half of the energy in the corn plant is contained in the grain (NRC, 1985). Grain is less susceptible to weathering losses than forages (Loerch, 2003). Furthermore, corn plants have a high profile and access by grazing animals would not be restricted by snow or ice. The optimum management system for corn grazing by sheep has not been identified. Optimum grazing management, corn fertilization rates, hybrids, planting dates, and planting density are unknown. This paper reports the results of a trial conducted at the OARDC Sheep Center, Wooster, OH. The objectives of the project were to determine the effects of four winter feeding systems on ewe performance and winter feed costs.

Experimental Procedures

The trial was conducted from early January to mid-March (~72 d) in 2002, 2003, and 2004. The treatments investigated were: 1) low density corn; 2) high density corn; 3) fescue regrowth, and 4) round baled hay. Each treatment had two replicates per year. An average of 108 Hampshire Dorset ewes (avg initial BW = 202 lbs) were used. Ewes were 8-43 d in gestation when the experiments were initiated each year. Each of the wintering grazing treatments was replicated by two fields and the hay treatment was replicated by two drylot pens. The 108 ewes were allotted by body weight and condition score to eight outcome groups and the outcome groups were randomly allotted to treatment replicates. The low and high density corn treatments were planted to achieve densities of approximately 22,000 and 37,000 corn plants/ac, respectively. Corn fields were fertilized with 150 lbs of N/ac applied in two applications. Each replicate corn field was 1.0 ac and electric fence was used to divide each field into 10 paddocks for strip-grazing. Ewes randomly selected to go on corn treatment were adjustment to corn grain by feeding .25, .50, .75, and 1.0 lb of corn/d for the four days preceding turnout in the corn fields. Twelve ewes were allotted to each of the four corn replicates. Ewes grazed each paddock from 7-14 d and were moved to their next paddock when all corn grain was consumed. Due to variability in the abundance of feed in each replicate, ewes rarely required the full acre to complete the 72 d trial. Amount of acres actually grazed was quantified and used to calculate ewe grazing days per acre. The stock-piled fescue treatment consisted of replicate fields of 2 ac each. Forage in these pastures was mob grazed the first week of August each year and forage regrowth was stock-piled for winter grazing. Each replicate was fertilized with 50 lb of N/ac the first week of August. The fescue treatments were investigated over two years (2003 and 2004). Twelve ewes were allotted to each replicate and fields were strip grazed with the aid of electric fence. Ewes were given access to a new strip of forage approximately every 7 d. For the hay treatment, first cutting fescue hay was offered free choice in replicate drylot pens. Each pen contained 23 ewes.

Ewes were weighed and body condition scored initially and every 14 d during the trial. Body condition score was on a 1-5 scale with 1 being emaciated and 5 being obese. Feed samples were collected in ungrazed areas at the initiation and end of the trial. After collection, feeds were dried and ground and analyzed for DM, CP, NDF, and ADF (AOAC, 2000). For corn treatments, plants/ac and grain yield (Bu/ac) were determined by counting the number of plants in a row of 17 feet 5 inches, and multiplying that number by 1000 to give plant density. Grain yield was calculated using the yield component method by measuring several rows of 17 feet 5 inches and collecting every 5th ear to count average kernel rows and average number of kernels per row .Yield equals ear number times avg. row number times avg. kernel number divided by 90. The total pounds of DM/ac was determined by cutting and drying 1 or 2 plants/ac in each corn replicate and multiplying by the actual plant density determined for each replicate. Fescue forage samples for DM available and nutrient composition were obtained by use of a 2 ft. 2 ft. metal square that was randomly tossed 6 times for each replicate. All forage within the square was hand clipped and composited.

Data were analyzed according to the PROC GLM procedures of SAS. The model included the effects of treatment, year, and treatment year. Treatment means were separated by PDIFF protected by a significant ($P < 0.05$) F-value. Each replicate was the experimental unit for all analyses.

Results

Target corn plant density for the low density corn was 22,000 plants/ac. Actual density varied from 2,000 in Year 1 to 2,533 plants/ac in Year 2 (Table 1). More variation was observed for the High Density corn treatment. The target was 37,000 plants/ac and the range observed was from 31,166 in Year 3 to 44, 583 in Year 2. Germination rate or inaccurate settings on the planter may have contributed to this variation. Grain yield was not recorded in Year 1. Low density corn had a yield of 127 and 97 bu/ac for Years 2 and 3, respectively. High density corn had a yield of 166 and 106 bu/ac for Years 2 and 3, respectively. Lower yields in Year 3 were likely due to lack of rain in the summer of 2004. Dry matter yield and nutrient content of corn plants, fescue pasture, and fescue hay are shown in Table 2. The corn fields (both treatments) averaged about 9,000 lbs of DM/ac in January at the start of the trial. In mid-March ungrazed areas averaged about 7,400 lbs of DM/ac. Stockpiled fescue pastures only had 1/5 as much DM (635 lb/ac) as the corn fields. By mid-March, only 196 lb of DM/ac was available for grazing. Crude protein content of corn plants was lower than fescue pasture while the fescue hay was intermediate. Values showed little change between early January and mid-March. All protein values were adequate to meet the needs of ewes in gestation (NRC, 1985). Fiber (NDF and ADF) values were lower for corn plants than for both sources of forage and as with protein, they did not change over the course of the trial. Ewe gain data (averaged over all three years) are presented in Table 3. Ewes grazing low density corn gained the most weight during the 72 d trial (24 lbs), those grazing stockpiled lost 4 lbs and those grazing high density corn and eating fescue hay in drylot were intermediate (17 and 13 lbs, respectively; $P < 0.01$). There was a Treatment Year interaction ($P < 0.75$) for body condition score change (Figure 1). In Year 1, ewes grazing low density corn had a greater increase in condition score than those grazing high density corn, but in subsequent years condition score change was similar between corn treatments. Ewes grazing stockpiled fescue or eating fescue hay lost from 0.7 to 0.9 units of body condition. Emergency/supplemental corn grain was provided when deemed necessary and there was a Treatment Year interaction ($P < 0.05$) for total supplemental corn grain provided (Figure 2). For the corn grazing treatments, no supplemental corn grain was provided in Years 1 or 2; a total of 11 lbs/ewe was provided in Year 3 due to adverse weather conditions. These ewes were moved to a barn for 5 days due to rain followed by a period of 0 weather. Ewes grazing fescue pasture were supplemented with 40-45 lbs of corn during the trial to prevent undesirable losses in weight and body condition score. In an attempt to maintain weight and body condition score, ewes fed fescue hay were supplemented with 9, 21 or 33 lbs of corn during the trial in Years 1, 2, and 3, respectively. Effects of winter feed source on ewe carrying capacity are shown in Table 4. Ewes in drylot consumed an average of 5 lbs of hay DM/d. Carrying capacity of ewes grazing both corn density treatments was similar. For both systems, an acre of corn would have supported 100 ewes for about 12 days. Stockpiled fescue pasture supported only 20% of the carrying capacity of the corn fields ($P < 0.01$). This supports the DM yield data presented in Table 2. Feed costs were calculated for all four systems and data are provided in Table 5. Grazing corn (either planting density) resulted in the lowest feed costs of 12.7/d. Estimated costs for feeding fescue hay were highest at 21.2/d. Grazing stockpiled fescue was intermediate at 16.8/d. These cost estimates are dependent on feed cost assumptions outlined above.

In conclusion, winter grazing standing corn or stockpiled fescue was an effective and economical feeding strategy for gestating ewes.

References:

Loerch, S. C. 1996. Limit-feeding corn as an alternative to hay for gestating beef cows. J. Anim. Sci. 74:1211-1216.

NRC. 1985. Nutrient Requirements of Sheep (6th Ed.). National Academy Press, Washington, DC.

Rayburn, Ed. 2000. Extending grazing season reduces costs. WVU Extension Publication 8/00.
Schoonmaker, J. P., S. C. Loerch, J. E. Rossi, and M. L. Borger. 2003. Stock-piled forage or limit-fed corn as alternatives to hay for gestating and lactating beef cows. J. Anim. Sci. 81:1099-1105.
Umberger, Steven H. 1996. Feeding Sheep. Virginia Tech Extension Publication Number 410-853.

Table 1. Estimated corn yield

Item	Low density	High density
Year 1		
Plants/ac	20,000	36,000
Bu/ac	----	
Year 2		
Plants/ac	22,833	44,583
Bu/ac	127	166
Year 3		
Plants/ac	22,500	31,166
Bu/ac	97	106

Table 2. Feed characteristics

	Corn density			
Item	Low	High	Fescue pasture	Fescue hay
DM/ac, lb				
Initial	8,751	9,274	635	--
Final	7,243	7,601	196	--
CP, %				
Initial	7.9	8.7	14.4	10.6
Final	8.1	7.9	13.8	--
NDF, %				
Initial	51.3	56.3	69.9	72.2
Final	52.8	49.1	70.8	--
ADF, %				
Initial	22.4	24.3	37.2	40.7
Final	24.2	23.5	39.4	--

Table 3. Effects of winter feed source on ewe body weight gain

	Corn density				
Item	Low	High	Fescue pasture	Fescue hay	SEM

Initial wt, lb	202	202	202	202	0.2
Final wt, lb	226a	219b	198c	215b	2.2
BW change, lb	24a	17b	-4c	13b	2.4

abcMeans differ (P < 0.01).

Table 4. Effect of winter feed source on carrying capacity

Item	Corn density Low	Corn density High	Fescue pasture	Fescue hay	SEM
100 Ewe d/ha	11.8a	11.9a	2.4b	--	0.3
Hay DM, lb/d	--	--	--	5.0	--

abMeans differ (P < 0.01).

Table 5. Effects of wintering systems on daily feed costs

Cost/ewe/d, $	Corn density Low	Corn density High	Fescue pasture	Fescue hay
Grazing	.127	.126	.146	--
Hay	--	--	--	.201
Corn	--	--	.022	.011
Total	.127	.126	.168	.212

* Editors note: Figures 1 & 2 can be found in the on-line edition posted at: http://knox.osu.edu/ag/sheep.html

I) CAN FENCES DETER COYOTES? - Stan Gehrt, Assistant Professor and Wildlife Extension Specialist

The coyote is one of the most successful carnivores in Ohio, as indicated by its widespread occurrence throughout the state. Some producers are fortunate and have few conflicts with coyotes, whereas others seem to have extreme conflicts each year. Unfortunately there is no single solution for managing coyote predation of sheep, and a combination of preventive and responsive strategies are sometimes necessary. Fencing is one option that has been used successfully under certain situations. Coyotes are devious and it can be difficult excluding them with fencing, but some designs are more successful than others.

Net-Wire Fencing is one fencing design that has been effective at deterring coyotes in certain situations, but it can be expensive. Horizontal spacing of the mesh should be less than 6 inches, and vertical spacing less than 4 inches. A barbed wire at the bottom can discourage digging, as will a buried wire apron (often an expensive option). The fence should be at least 5 feet high to discourage coyotes from jumping over it (coyotes usually jump and climb over fences 5 feet high or taller, they cannot typically clear a fence of that height). Because of its expense, net-wire fencing is usually used for smaller areas used for temporary holding.

One fringe benefit to using this type of fencing is that if predation occurs, it is easy to find where the coyote is getting underneath the fence, which makes removal (such as with snares) that much easier.

An alternative to net-wire fencing is electric fencing, which is often used for livestock. This design is usually cheaper than net-wire fencing, but requires more maintenance. The fences are made of high-tensile wire stretched to a tension of 200 to 300 pounds. The original design of electric fences for controlling predation consisted of multiple, alternately charged and grounded wires, with a charged trip wire installed just above ground level about 8 inches outside the main fence to discourage digging, but most recent designs have every wire charged. The number of wires, and spacing between them, can vary considerably among sites. A standard design uses 13 strands, but other designs have used less. Electric fencing is best used in areas of flat terrain with relatively little vegetation, and high tensile wire requires adequate bracing at corners.

Labor to keep electric fencing functional can be significant. Tension of the wires must be maintained, excessive vegetation under the fence must be removed to prevent grounding, damage from livestock and wildlife must be repaired, and the charger must be checked regularly to ensure that it is operational.

Finally, another option is to electrify an existing fence. This can be particularly effective if a net-wire fence is modified with electric wire. In this case a charged trip wire is placed 6 to 8 inches above the ground about 8 to 10 inches outside the fence. One to three additional wires may be added with variable spacing (in each case, maintaining the 8 to 10 inches away from the fence, terminating with a top wire to discouraging climbing over the fence.

If coyotes are climbing or jumping a fence, charged wires can be added to the top and at various intervals. These wires should be offset outside the fence. Fencing companies offer offset brackets to make installation relatively simple. The number of additional wires depends on the design of the original fence and the predicted habits of the predators.

The latter fence design (combination of net-wire and electric wire is currently being tested at the Ohio State University Sheep Research Center near the Wooster Campus. The sheep center maintains a flock of approximately 350 ewes for research purposes, with about half lambing in February and the other half in May. During 2006 the center lost many lambs to coyotes, which complicated research projects involving the lambs. Consequently, the sheep center built predator-proof fencing for a portion of the facility in an attempt to eliminate lamb loss for 2007. Because of the expense, the Center has electrified only a subset of available pasture, and rotates ewes with lambs accordingly. Current research involves monitoring coyote activity to determine the effectiveness of the fence design. This design will be on display at the 2007 Ohio Sheep Day.

As with all aspects of predator management, producers must consider the economic loss to predation balanced against the cost of the fence, expected life of the fence, and the relative effectiveness of the design when determining which fencing system is most suitable.

MORE INFORMATION

Where tables are included every effort is made to transmit the tables intact. Due to the setup of different e-mail receiving programs tables may not be readable due to shifts in lines and font sizes etc. Readers can visit our web site when table formats are unreadable. The newsletter will be posted on the web site at:
http://knox.osu.edu/ag/sheep.html

Readers can subscribe electronically to this newsletter by sending an e-mail message addressed to: sheeptnews-on@ag.osu.edu A successful subscription message will receive a reply. Contact your local Ohio State University Extension Office or e-mail mccutcheon.30@osu.edu if you have problems subscribing.

Editor: Jeff McCutcheon