

For more information,
 contact your local
 University of Missouri
 Extension Center:

- **Audrain County**
(573) 581-3231
- **Benton County**
(660) 438-5012
- **Boone County**
(573) 445-9792
- **Callaway County**
(573) 642-0755
- **Carroll County**
(660) 542-1792
- **Chariton County**
(660) 288-3239
- **Cole County**
(573) 634-2824
- **Cooper County**
(660) 882-5661
- **Howard County**
(660) 248-2272
- **Moniteau County**
(573) 378-5358
- **Morgan County**
(573) 378-5358
- **Osage County**
(573) 897-3648
- **Pettis County**
(660) 827-0591
- **Saline County**
(660) 886-6908

University of Missouri,
 U.S. Department of Agriculture
 & Local University Extension
 Councils Cooperating

Equal Opportunity /
 ADA Institution



Your link to the Universities for ag extension and research information.

Saving Money with GPS Technologies in Forage Production

GPS (Global Positioning System) and other electronic technologies have facilitated many innovations in agricultural field machinery. One of these innovations is the development of GPS-based guidance aids commonly referred to as “lightbars”. The primary function of a lightbar is to show a driver how to steer the machine along accurate parallel passes or swaths across a field.

The primary advantage of using a lightbar is a reduction in application errors (overlaps and skips). Using a set of 9 example fields in Central Missouri ranging in size from 33 to 79 acres for a total of 510 acres, potential savings in fertilizer and fuel were analyzed using GPS technology to apply fertilizer to forage. Assumptions made in this analysis include using a tractor drawn spinner fertilizer spreader with a 60 foot spread pattern. The fertilizer spreader was pulled with a 165 hp MWF tractor with a fuel consumption of 10.66 gallons per hour. Costs used in this analysis were \$59.50 per acre for fertilizer and \$4.40 per gallon for diesel fuel.

Comparisons were made looking at overlap reductions from 10% and 5% to 0%. These overlap reductions affect the distance traveled and area covered. The following tables show potential fertilizer and fuel savings.

Potential Fertilizer Savings

Amount of Overlap	5%	10%
Extra Acres	28.0	57.5
Extra Fertilizer Cost	\$1,667.00	\$3,419.00
Extra Fertilizer Cost per Acre	\$3.27	\$6.71

Potential Fuel Savings

Amount of Overlap	5%	10%
Extra Gallons of Fuel	24.0	29.4
Extra Gallons of Fuel per Acre	0.05	0.06
Extra Dollars	\$105.49	\$129.23
Extra Dollars per Acre	\$0.21	\$0.25

With basic lightbars cost from \$1,000 to \$3,000, it does not take a very long time to recover the investment and start realizing fertilizer and fuel savings.

Lightbars can also improve machine operation in poor visibility. For example, early or late in the day when sun glare can make it difficult to see foam markers or fencerow references, a lightbar is easily visible, thus making it possible to guide more accurately. Also, some cover crops can make it difficult to see foam or mechanical marks.

Most lightbars are designed to be placed in the peripheral vision of the driver, usually just above the steering wheel or on the forward hood. As such, the driver does not have to focus as much attention on the display as he or she does with external indicators such as fencerow

references or foam markers. This means that the driver experiences much less fatigue. Additionally, it is easier for the driver to monitor other machine functions and displays. Another advantage of lightbars is record keeping. Many lightbar systems will record the path of the machine through the field, and some will even record whether or not the machine was applying. This data can be a valuable record of exactly where inputs were applied and the time of application.

In short, lightbars are a new, relatively simple technology that can bring many advantages to farm operations. For more information please contact myself.

Author: Kent Shannon, Natural Resource Engineering Specialist

Feeding of Wheat to Beef Cattle

Producers have been asking questions about feeding wheat to beef calves. Wheat can be an excellent ration ingredient, but a few cautions are in order.

Wheat does need to be coarsely processed prior to feeding. According to Australian research, whole wheat has a digestibility of about 60 percent compared to 86 percent for dry-rolled wheat. Grinding wheat will generally result in excess fines causing potential for bloat, founder and acidosis.

Wheat should be limited to 1 percent or less of the animal's body weight with growing cattle. This is due to the fact that wheat starch is rapidly fermented in the rumen and rapid fermentation can lead to digestive upsets as well as bloat, founder and acidosis.

Light test weight or sprouted wheat can be utilized in beef cattle rations. If these conditions are not excessive, the feed value of this wheat will be similar to corn or grain sorghum. Damaged wheat must be stored carefully to ensure mold does not grow.

One hundred pounds of wheat has about the same protein and energy as 92 pounds of corn and 8 pounds of 48 percent soybean meal. If corn is priced at \$7/bushel and soybean meal costs \$450/ton, the breakeven price for wheat is approximately \$7.90/bushel.

Below are web sites from North Dakota State University, Oklahoma State University and Kansas State University that have more information on feeding wheat to beef cattle. If you have questions about feeding wheat or would like help with evaluating feeding programs, please call your regional livestock specialist.

- <http://www.ag.ndsu.edu/pubs/ansci/beef/as1184w.htm>
- <http://pods.dasnr.okstate.edu/docushare/dsweb/Get/Document-1938/ANSI-3029.pdf>
- <http://www.oznet.ksu.edu/library/lvstk2/MF2659.pdf>

Author: Gene Schmitz, Livestock Specialist

Drought, Deluge or Frost

The 2008 growing season has been a challenge for many. Current weather conditions have many producers struggling to get crops planted and managed. Hay producers are having problems getting hay cut and put up on a timely basis. Rainfall this year has set records in many places. It seems to rain about every other day.

It is difficult to believe that in early spring we started off with several predictions of having a serious drought this year. Dr. Elwyn Taylor, a meteorologist at Iowa State, made several points this spring about the possibility of a drought in 2008. His points were as follows:

1. Historically, serious droughts come along every 19 years. The last major drought in the Corn Belt was in 1988. Alone this is not enough to ensure a drought but is an indicator to be watchful.
2. South Carolina experienced a major drought in 2007 and in the past it has always been followed by a drought through the Corn Belt as it did from 1987 to 1988. Sixteen of the past seventeen Midwestern droughts have been preceded by a drought in southeastern states the prior year and only twice has a Southeastern drought provided a false alarm.
3. Taylor also has pointed out that droughts never seem to occur when an El Nino weather pattern is in place, but can exist during a La Nina pattern. We had entered La Nina on Christmas Day, this past Christmas. Their forecast for this summer is that this La Nina will not persist and that it would be gone by May.

Recent research done by Florida State University shows that the presence of El Nino during the North American summer usually means very warm to hot and dry weather over much of the Midwest. The U.S. climate prediction center and some private meteorologists' analysis of the sea surface temperatures does not show any sign of Pacific warming taking place. The trend is basically showing no signs that we are jumping into an El Nino. If anything, the sea surface temperatures look like they have come down slightly during the month of June.

This is both good and bad. Conditions do not appear to be shaping up for hotter and drier weather in the Midwest during the major growing season. With no additional flooding, rain makes grain. However, the cooling surface temperatures have implications with what could happen at the end of the growing season. Late planted crops could be more vulnerable to frost and an early killing freeze. One private meteorologist states that the implication of an onset of cold weather is certainly there, including the prospect of an early frost in the later sector of the season.

Another result of the neutral Pacific temperatures and El Nino not developing is that tropical storm activity may be more threatening. With all of these possibilities, there is a lot of speculation and uncertainty.

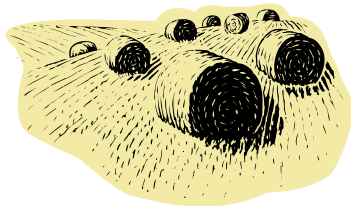
Author: Wayne Crook, Agronomy Specialist



Stockpiled Grazing to Decrease Fuel Costs

For many years now, the benefits of stockpiled tall fescue pasture for feeding beef cows during the fall and winter has been written about and discussed. However, one aspect of grazing vs. feeding hay that needs to be considered is the impact of fuel cost relative to feeding bales. Granted, it takes additional fall nitrogen (N) fertilizer, portable fencing material, and some fuel and time to move fence across stockpiled fescue pastures. But you may want to weigh that against the cost of starting up a tractor every day.

Individual producers should have a good handle on fuel consumption necessary for hay feeding. So the question becomes, "How much extra forage do I get by fertilizing fescue in August for stockpiled feeding in the fall and winter?" In general, 15 to 20 pounds of additional forage dry matter will be obtained per unit of N applied. On higher fertility soils with good soil moisture availability and correct timing of N application, the response will be above these levels. Poorer or drier soils combined with late N application will respond toward the low end of the range. Timing N application in the first half of August results in more forage per unit N compared to later N applications.



The University of Kentucky has an excellent publication that describes stockpiled tall fescue production. It considers the impact of factors such as hay price, N price, soil type, soil moisture availability, etc. on determining an optimal level of N application. This publication can be found at http://www.uky.edu/Ag/AgEcon/pubs/ext_aec/2007-09.pdf

Just because N is expensive, don't assume you can't afford to apply it! Hay prices look to be high this year, compared to past years, and feeding that hay will also be more expensive. Consider those costs versus the cost of N and see if you can trim some hay and fuel expenses out of your beef enterprise. Being able to graze an extra 30, 45 or 60 days often goes a long way toward decreasing annual feed costs for the cow herd.

If you haven't tried stockpiling tall fescue pastures, this may be the year to try it. If you would like specific information on how to produce and manage stockpiled pasture, contact one of the MU Extension livestock specialists or agronomists in your area.

Author: Gene Schmitz, Livestock Specialist

Time for Fall Gardening

Fall is an excellent extension of the garden season and a vital period for intensive gardening methods. Many cool-season and some warm-season vegetables attain their peak quality when grown and harvested as late crops. When planning for the fall garden, gardeners should consider the

space needed, soil preparation, rotations and varieties desired. Seeds that were purchased for spring planting can be used for the fall garden provided they were stored in a cool location and kept dry.

The main challenge with fall vegetable production of cool season vegetables is seeding or transplanting a crop when the weather is hot and then getting good establishment and vigorous growth. When seeding in late summer for a fall crop, moisture is often an issue. Water immediately after seeding or transplanting. Plant the seeds slightly deeper than you would normally plant them in spring to improve moisture availability for germination and root growth.

Cool-season vegetables will thrive in the cooler nights of late summer and fall and are not sensitive to frost. Since it is difficult to get uniform seed germination and seedling emergence in the high soil temperatures common in late summer, consider transplanting hardy cole crops such as broccoli, cabbage, cauliflower, and Chinese cabbage in early to mid-August for fall harvest. The transplants of these cole crops should be four to six weeks old. Transplanting in late afternoon or early evening will reduce transplant shock. Also, you can tighten plant spacing to accelerate growth.

Greens (collards, kale, mustards and turnips) and lettuce are also well adapted for fall culture. Greens can be seeded through August and harvested approximately 50 days from seeding. Turnips can be planted to produce greens or roots, depending on the variety. Both lettuce and spinach grow well in the fall and an ideal time for seeding is the first week of September (Labor Day weekend). Spinach often overwinters successfully and produces abundantly in April.

Many warm-season vegetables can be grown successfully in late summer and fall, including fall tomatoes, snap beans and summer and winter squash. Snap beans can be seeded in early to mid-August in most areas of Missouri. Bush beans grow best at temperatures from 75 to 85 degrees but will drop flowers if temperatures exceed 90. They mature in approximately 60 days and make an excellent fall crop.

Since the last planting date for tomatoes, peppers, pumpkins, squash and cucumbers has passed, review the plants you already have and determine if they might benefit from additional or more regular watering, a side dress application of nitrogen, or an application of a fungicide or insecticide for a pest issue. Remember that most warm-season vegetables are tender and must be harvested before frost. Any tomatoes left on the vine when frost is predicted can be harvested green for green tomatoes, or, if they have started to turn, can be stored in a paper bag or wrapped in newsprint to ripen inside at 70 degrees Fahrenheit. Pumpkins and winter squash are sensitive to cool temperatures, but the fruit is often harvested after the first frost. For information on specific planting dates recommended for the different vegetable crops see the MU Guide Vegetable Planting Calendar: <http://extension.missouri.edu/explore/agguides/hort/g06201.htm>

Author: James Quinn, Horticulture Specialist



Introducing New Staff

We would like to introduce Kent Shannon, our new Natural Resource Engineering Specialist in the Central Missouri region. He will be based in Boone County. Kent Shannon grew up on a diversified crop and livestock farm northeast of Macon, Missouri and then attended the University of Missouri receiving a BS and MS degree in Agricultural Engineering in 1991 and 1993, respectfully. Kent started his extension career as an Agricultural Engineering Specialist in Northeast Missouri at Kirksville in 1992. He moved into the position of Extension Associate in Ag Engineering in 1998 as Associate Director of the Missouri Precision Agriculture Center. Kent has worked to educate Missouri crop producers and their advisors through on-farm research and providing training and consultation on the use of spatial data analysis software (GIS, Geographic Information System), and GPS (Global Positioning System) software and hardware.

Upcoming Field Days

Date, place, event and contact person are:

- Sept. 18 - South Farm, Columbia; Beef Production Field Day; Bob Weaver, 573-882-5479
- Sept. 27 - South Farm, Columbia; Showcase; John Poehlmann, 573-882-4450
- Oct. 3 - Wurdack Farm, Cook Station, MO.; Field Day; John Poehlmann, 573-882-4450
- Oct. 18 - Horticulture and Agroforestry Research Center, New Franklin, MO.; Missouri Chestnut Roast; Nancy Bishop, 660-848-2268



AG CONNECTION

Ag Connection is published monthly for Central Missouri Region producers. Ag Connection can be found in the Internet at: <http://extension.missouri.edu/agconnection/index.htm> .

Editorial Board: Joni Ross, Managing Editor; Parman Green, Mark Stewart, Jim Jarman, Todd Lorenz, Wendy Flatt, Mary Sobba, Gene Schmitz, Dee Cooper Jim Quinn, Wayne Crook, Dustin Vendrely.

Please send your comments and suggestions to the editor at:

University of Missouri Extension
100 E. Newton Street, 4th Floor, Versailles, MO 65084
E-Mail: rossjo@missouri.edu
573-378-5358

UNIVERSITY OF MISSOURI
 Extension

"Equal opportunity is and shall be provided to all participants in Extension programs and activities, and for all employees and applicants for employment on the basis of their demonstrated ability and competence without discrimination on the basis of their race, color, religion, sex, sexual orientation, national origin, age, disability or status as a Vietnam-era veteran. This policy shall not be interpreted in such a manner as to violate the legal rights of religious organizations or military organizations associated with the armed forces of the United States of America."