

# Livestock Links

A Statewide Newsletter for Alabamians

Fall 2011

## Bobby Jones Uses Silage for Stockers

**Jonathan Gladney**, *Regional Extension Agent*, **Jimmy Smitherman**, *County Extension Coordinator*

Bobby Jones is a former Extension agent who currently manages The Feedlot, Inc., which is a general-purpose farm supply store in Pike Road, Ala. He also manages the cattle and farming operations for H.B. Bartlett, DVM, where he began working in 1979. At that time, and until 2008, backgrounding stockers was one of the enterprises in which corn and intermediate forage sorghum silage was used.

Jones says that for most of the 29 years planting, harvesting, ensiling and feeding silage, he planted 250 acres of corn. Some years he would chop the corn and then replant the 250 acres with intermediate forage sorghum. The crops were planted in 30-inch rows and chopped using a Hesston self-propelled Field Queen. After the crop was chopped, it was then placed into bunker silos and covered with plastic.

According to Jones, in 1980, there were 60,000 acres of soybeans in Montgomery County as well as a thriving dairy industry. There were also many row-crop farmers and dairy operators farming corn and sorghum for silage along with the soybeans. It takes an extensive amount of infrastructure to make the silage-making business function. In 1980, there were two-row choppers that were pulled behind a tractor on every corner. By 1985, however, the soybean business collapsed



**Bobby Jones and Janey Smitherman**

due to governmental policy changes. The row-crops business, for the most part, in Montgomery County and throughout the Blackbelt Region disappeared. The dairy industry also started decreasing. Background operators began to be able to get cheap commodities such as soyhulls, corn gluten, cottonseed and others to make rations more cheaply. So as time progressed, the equipment got old, and the farmers who knew how to plant, harvest and ensile corn and sorghum retired.

In 2009 and 2010, government policies of paying to use corn to fuel cars increased the cost of all commodities to such a level that stocker operators and backgrounding operations had to look for cheaper sources. The current generation of cattle managers have a limited dairy or row-crop background trying to utilize silage, and many land-grant universities throughout the South no longer have personnel who have knowledge of the silage-making process. The modern-day equipment is bigger, faster and much more expensive. Current-day silage choppers are close to \$200,000.

"I do not consider myself a specialist with silage," says Jones, even though he grew up feeding silage to brood cows on his family farm, his graduate project for his Masters of Science degree from Auburn University dealt with feeding corn silage, and silage was the staple feed ingredient for dairy and some beef cattle when he was a county Extension agent. For the 29 years since he began working for Bartlett, Jones has been managing this crop and the process of making silage for use in their backgrounding operation along with the brood cow herd. Jones says, "This is just fantastic stuff. I really like working with silage." However, the infrastructure of both equipment and educational information needs to be recreated for the new generation of stocker operators and backgrounders to be able to succeed in utilizing silage to its full potential.

# Growing Corn for Silage

Anthony Wiggins, *Regional Extension Agent*

Corn silage is often thought of as a crop used mainly on dairy farms, but it is used in beef cattle operations as well. It is a high-yielding, very digestible, high-energy feed. However, as with any feed these days, it is an expensive feed to grow. If you are thinking of growing corn for silage, there are a number of practices you should implement to get the most out of your crop.

The first step is to take a soil test, and then apply lime and fertilizer accordingly since corn silage removes a lot of nutrients from the soil. Compared to a corn crop that is raised for grain, a 20-ton corn silage yield can remove one and a half times as much N, two times as much P<sub>2</sub>O<sub>5</sub>, and four and a half times as much K<sub>2</sub>O. Replacing these nutrients to keep a field productive is expensive. If you are fortunate enough to have access to poultry litter as a fertilizer, keep in mind that only a portion of the nutrients in poultry litter will be available to a crop the year it is applied.

Another important step in producing a good silage crop is selecting the proper variety. Finding information for varieties specific to silage yields can be difficult. Research has shown that good grain yielders often make good silage yielders, but don't use yield as the only means for variety selection. Selecting varieties that are resistant to lodging and diseases is another important characteristic to select for since these can decrease yield. In some parts of the state, double-cropping silage may be an option. If this is the case, selecting short-season varieties for later plantings becomes important.

Planting at the proper time can also affect yield. Typically, earlier plantings will yield more than later plantings. The recommended planting dates for Alabama are as follows:

South Alabama March 1–April 20  
Central Alabama March 15–April 30  
North Alabama March 25–May 15

Plant populations and row spacing are other considerations when growing corn for silage. Plant populations should be based on expected yield potential. If 20 tons per acre is the expected yield potential for a field, then 22,000 to 24,000 plants per acre should be the goal. Populations should be adjusted based on the expected yield and productivity of the site. Conventional corn systems typically plant corn in rows 30 to 42 inches apart. To reach a goal of 24,000 plants per acre on 30-inch row spacings, seed should be spaced at 7.5 inches apart in the row. More current research has shown that planting corn in narrower rows, but at the same or slightly higher plant populations, has increased yield and improved the water-use efficiency of the plants.

Finally, controlling weeds in a silage crop can have a positive impact on yield. Weeds competing for sunlight, water and nutrients will decrease silage yields. The Alabama Cooperative Extension System has IPM guides for selecting appropriate herbicides and weed-control recommendations. The corn IPM guide can be found at [www.aces.edu/pubs/docs/A/ANR-0500-A/VOL1-2011/corn.pdf](http://www.aces.edu/pubs/docs/A/ANR-0500-A/VOL1-2011/corn.pdf).

Although there are many factors such as rainfall, temperature and insects that can affect yield, paying attention to the above practices will ensure that you have done your part for growing a good silage crop.

## Fermentation Process of Corn Silage Is Key

Jonathan Gladney, *Regional Extension Agent*, Brenda Glover, *Regional Extension Agent*

The corn silage fermentation process is the key to the quality, use and ultimately, the profitability of corn silage. Taking the time to understand the fermentation process may help someone who is trying to use corn silage be successful. The following is an excerpt from a publication written by Dr. Gary Bates, who is a professor of Plant Soil Science at the University of Tennessee Extension Service, explaining the fermentation process in corn silage.

When a corn plant is chopped and put into a storage facility, the cells of the corn plant are still alive. The respiration of these plant cells and the microorganisms in the silage produce carbon dioxide and heat. This process is called aerobic respiration because oxygen is used. As the carbon dioxide level increases and the oxygen level decreases, respiration will decrease and stop, and anaerobic (without oxygen) fermentation begins. In this process, desirable bacteria use the soluble carbohydrates in the cells to produce primarily lactic acid, which causes a drop in pH. Fermentation occurs until enough lactic acid is produced to drop the pH to approximately 4.2, at which point all bacterial action stops. This usually occurs within 3 weeks after a silo is filled. If low levels of lactic acid have been formed, then butyric acid, a foul-smelling acid, is produced, and the silage spoils.

Day 1: Cell respiration produces CO<sub>2</sub>, heat and water. (Temp ~ 70° F but rising; pH of about 6 starts to fall)

Day 2: Fermentation begins producing acetic acid. Heating process slows. (Temp peaks at ~ 95° F; pH should be around 5)

Day 3: Lactic acid production begins. Acetic acid production continues. (Temp is falling; pH should be around 4)

Days 4 to 7: Lactic acid continues to be produced. Temperature drops. (Temp reaches 80 to 85° F; pH stable at 4)

Days 8 to 21: Lactic acid continues to be produced. Silage pH drops and becomes stable.

After day 21: Bacterial fermentation stops. Silage preserved until re-exposed to oxygen. (Silage cools to ambient temperature; pH remains 4)

So what does this mean as far as ensiling corn on harvesting day? Chop and pack. In other words, chop the silage and then pack it to remove as many air pockets as possible. It does not matter whether you have a trench or bunker silo or whether you are stacking the silage on top of the ground between rolls of hay — it needs to be packed using the right type of equipment. Anything with tracks is not going to pack the silage tight enough.

The best packing equipment for silage is a large, rubber-tired articulating tractor. Equipment with tracks spreads the weight over a much greater surface area, which prevents packing. The surface area on an articulating rubber-tired tractor is exponentially smaller, allowing more pounds of pressure per square inch on the silage.

Next, it is important to cover the silage with 6-mil polyethylene plastic to produce an air-tight structure. If you are using rolls of hay or some other structure, take the plastic all the way over the hay and at least 10 to 15 feet beyond the rolls of hay and the edges of the silage. Secure the plastic cover with 3 to 4 inches of sawdust, sand or other similar material. Old tires can be placed across the cover to help hold down the plastic and sand.

### Precautions

Avoid taking too much time in getting the silage covered; however, you want to make sure that you are not stacking the silage so fast that your rubber-tired tractor does not have time to adequately pack the silage to remove the excess air. If one or both of these problems are not avoided, the production of lactic acid is delayed during day 3, therefore allowing the pH and temperature to stay elevated longer. If the pH and temperature do not drop quickly enough, butyric acid will be formed, the bacterial fermentation process will not end, and the feed stuff will not become stable. The result will be excess waste, lower quality and less palatable silage. If this does occur, you will need to mix more of the high-priced feed commodities into the ration to get the desired rate of gain on feeder and stocker calves.

## Feeding Corn Silage to Alabama Stocker Cattle

Henry D. Dorough, *Regional Extension Agent*

Silage in most farming communities has long been recognized as a dairy cattle feed. However, all across the country, especially where silage production is common, corn silage has become a preferred feed in stocker cattle rations because it can produce gains of 1.25 to 2.0 pounds per day, is a relatively safe feed, can be relatively cheap to produce and can be easily substituted for a high-grain diet.

The nutrition of corn silage can vary widely. A 2004 study by North Dakota State University determined that corn silage contained an average of 8 percent crude protein (6 to 17 percent) and 65 percent total digestible nutrients (55 to 75 percent). Because of the wide range of nutrition in corn silage, the nutritional composition of each batch must be tested to properly balance the dietary needs of growing cattle. For stocker cattle to gain 2.0 to 2.5 pounds per day requires 12 to 14 percent crude protein and 63 to 68 percent TDN in their daily intake.

The majority of stocker cattle in Alabama are wintered on cool-season forages such as ryegrass and small grains, which if well managed can provide the bulk of the nutrition required by stocker cattle. In most stocker operations, cattle are offered protein supplements such as soybean hulls (SH), soybean meal

(SBM), whole cotton seed (WCS), cotton seed meal (CSM), corn gluten feed (CGF) or dried distillers grains (DDG).

Most calves are not accustomed to high-moisture feeds such as silage and may take a little time to begin eating it, but once they get used to it, high-quality corn silage could meet all of their needs. In most cases, however, a protein supplement will still need to be considered.

A North Carolina State University study in 1992 evaluated several by-products (WCS, DDG and CGF) relative to corn and SBM in corn silage-based rations for stocker cattle. All diets contained 76 percent corn silage and 24 percent supplement on a dry basis, contained similar nutritional composition and were fed to 400- to 500-pound steers. Feed intake was reduced by approximately 1 pound per day, and daily gain was reduced by 0.2 to 0.4 pounds per day for all three alternative concentrates when compared to corn and soybean meal.

Another NC State study conducted in 1994 evaluated SH as a supplement to corn silage. Steers weighing 400 to 500 pounds were broken into eight groups. Four groups were fed free-choice hay in addition to 6.5 pounds of one of two grain mixtures. Two of these groups were given a mixture of 82 percent corn and 17 percent SBM, and two groups were given SH alone. The remaining four groups were provided a free-choice ration consisting of 75 percent corn silage and 25 percent grain supplement on a dry basis. Two of these groups received a mixture of 51 percent corn and 48 percent SBM, and the two remaining groups received a mixture of 17 percent SBM and 82 percent SH. All cattle were given free-choice trace mineral salt.

The results of this study indicated a lower dry matter intake and average daily gain for the hay-based diets than for the silage-based diets. The source of concentrate, however, did not influence intake or gain. There was one interesting observation with this study. Corn with SBM provided higher gain than SH in the hay-based diets, but the opposite occurred in the silage-based diets.

Forage sorghum can also be used to produce silage. However, most studies indicate feeding forage sorghum silage will result in lower cattle gains when compared to corn silage. Forage sorghums do have advantages in that they are more drought-tolerant relative to most silage corn varieties, and they are more widely adapted to the various soil types in Alabama.

In summary, stocker cattle grazing well-managed winter annual forages will typically perform quite well, especially when additional protein is supplemented in their diet. Silage, particularly corn silage, can serve as an excellent supplement, but it must be analyzed to ensure that protein levels are adequate. When silage protein is lacking, it can be boosted with the addition of supplements such as whole cotton seed, dried distillers grain, soybean meal, soy hulls, cotton seed meal or corn gluten feed. The amount of protein supplement depends on the results of the silage nutritional analysis. Soy hulls may provide a slightly better impact on animal gain than the other by-products; however, the price of each supplement should be considered with respect to the economics of cattle gain.

For more information on supplementing stocker cattle and forage/silage analysis, contact your Animal Science and Forages Regional Extension Agent or visit [www.aces.edu](http://www.aces.edu).



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## Calendar of Events

### Demopolis • Contact Brenda Glover (334) 321-8828

|            |                           |
|------------|---------------------------|
| October 4  | Grass Masters Session I   |
| October 11 | Grass Masters Session II  |
| October 18 | Grass Masters Session III |
| October 25 | Grass Masters Session IV  |

### Letohatchee • Contact Gladney (334) 341-1674

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| October 20  | Grass Masters Session I  |
| October 27  | Grass Masters Session II   |
| November 3  | Grass Masters Session III  |
| November 10 | Grass Masters Session IV   |
| October 22  | Wiregrass Forage Based BCIA Bull Evaluation, 22nd Annual Bull Sale & Bred Heifer Sale, Elba. Contact Rickey Hudson at (334) 693-2010/ (334) 726-6814 or Michelle Elmore at (205) 646-0115/(205) 287-1080 |
| November 3  | Regional Forage Conference, Montgomery. Contact Jimmy Smitherman at (334) 270-4133   |
| December 1  | Alabama Grazing Conference, Lake Guntersville State Park   |