

Vol. 5, No. 3

Fall 2013

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## Utilization of Brassicas to Extend the Grazing Season

*Kenny Simon, Program Associate - Forages,  
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and John Jennings, Professor - Forage*



Providing adequate, high quality forage for grazing in late October through December is difficult to accomplish with traditional winter annuals such as wheat, rye or ryegrass. Forage brassicas can extend the grazing season in fall when other forages are less productive, therefore reducing the dependence on stored or purchased feed. Forage brassicas, a winter annual crop, grow quickly and provide palatable and nutritious forage for livestock. Grazing may begin 50 to 75 days after seeding, depending on the species and weather. Proper grazing management is important to optimize the true potential of these crops.

Twenty-three demonstrations were conducted to determine optimum methods for establishing brassicas as forage.

Brassicas were planted with either a broadcast seeder or a no-till drill from late August through late October. Brassicas were seeded onto undisturbed sod, sod that had been lightly to moderately disked or onto a prepared seedbed. Four forage brassica varieties were used in our demonstrations: Appin, Barkant (turnips), Bonar (rape) and Pasja (hybrid). Appin, Bonar and Pasja are products of Ampac Seed Company. Barkant is a product of Barenbrug Seed Company. Common Seven-top turnip was used as a check variety. Seven-top is commonly used as a vegetable crop but has a history of being used as a forage crop for small ruminants and deer food plots in Arkansas. In addition to the brassicas, Marshall ryegrass was overseeded at 22 pounds per acre.

Recommendations have been formulated after four years of observation and data collection. More field preparation is required for successful establishment of brassica than for ryegrass or small grains. Ryegrass and small grains are commonly planted either by no-till drill or by broadcasting seed over a short sod followed by a harrow or field drag. Those methods **were not** adequate for turnip establishment in our demonstrations. Our experience suggests that early planting (late August to mid-September) and soil disturbance

**Table 1**

Brassica	DM yield lbs/acre Average (Range)	Number of Demonstrations
Forage Varieties	3,025 (2,267–3,867)	8
Seven-Top	2,480 (N/A)	1

•Planted by the first of September  
 •Fertilized to soil test recommendations  
 •Moderate to heavy soil disturbance

**Table 2**

Brassica	DM yield lbs/acre Average (Range)	Number of Demonstrations
Forage Varieties	1,540 (1,128-2,389)	11
Seven-Top	1,138 (N/A)	1

•Planted after the middle of September  
 •Not fertilized to soil test recommendations  
 •Light or no soil disturbance

(light to heavy disking) **are required** for successful stand establishment of turnips. Sod-seeding and planting in late September into October did not produce acceptable stands. Best establishment was observed when planting on a firm, disked seedbed. Poor establishment resulted from broadcast seeding on a loose, disked soil followed by dragging or rolling, probably due to seed being placed too deep. Seeding rates of 2 to 3 pounds per acre were best when planting with ryegrass or small grains and no more than 5 pounds per acre when planting turnips as a pure stand. Grazing began 50 to 75 days after seeding, depending on the species and weather.

At the time of sampling and the start of grazing (approximately November 1), the ryegrass had not reached adequate forage height to sample or graze. Brassica varieties yielded 1,100 to 3,800 pounds of dry matter per acre, depending on variety, degree of soil disturbance and fertilization. Forage varieties planted by the first of September on a moderate to heavy disked seedbed and fertilized to soil test recommendations yielded an average of 3,025 pounds per acre; seven-top produced 2,480 pounds per acre (Table 1). Forage varieties planted after the middle of September on light to no soil disturbance and not fertilized to soil test recommendations yielded an average of

1,540 pounds per acre; seven-top produced 1,138 pounds per acre (Table 2).

The crude protein and TDN exceeded the nutritional requirements for all classes of livestock, with CP ranging from 18 to 33 percent and TDN ranging from 72 to 89 percent. The fiber content of brassicas is too low for maintenance of proper rumen activity (ADF 18.06 and NDF 20.5); therefore, brassicas were managed to supplement the diet of the livestock. Forage was managed for regrowth during the initial grazing. Grazing was initiated when the plants reached 14 to 18 inches and terminated when the forage was grazed to 6 to 8 inches. The forage brassicas produced regrowth after the initial grazing, whereas the seven-top did not. During the second or final grazing, the livestock were allowed to consume the entire plant, including the bulbs.

Table 3 and Table 4 show a summary of the project data for 2011-12 and 2012-13, respectively. Demonstrations were planted either as a pure stand of brassica or brassica was planted in combination with ryegrass, and they were grazed by small ruminants and beef cattle. Forage production was calculated as animal unit (AU) grazing days per acre based on the number, weight and nutrient requirements of animals on each farm. Cost savings were calculated by comparing the cost of growing the annuals to the cost of feeding hay and supplement. The cost savings and the number of grazing days varied depending on planting date, variety/species planted, fertilization and grazing method. The greatest cost savings and the most grazing days were from farms that planted brassicas in combination with ryegrass, fertilized according to soil test recommendations and used rotational grazing.

Planting forage turnips is a low-cost and effective method for providing high quality forage for grazing in late October through December. 

**Table 3**

County	AU	Acres	Savings/AU	Total Savings	AU Grazing Days/Acre
*Cleburne	6.0	0.5	\$11	\$67	132
**Faulkner	18.7	8.0	\$456	\$8,540	459
*Ouachita	2.6	2.25	\$211	\$557	140
*Sebastian	29.4	5.0	\$38	\$1,125	212

**Table 4**

County	AU	Acres	Savings/AU	Total Savings	AU Grazing Days/Acre
**Faulkner - 1	27.4	15	\$436	\$12,959	357
**Faulkner - 2	36.0	65	\$542	\$19,519	142
**Fulton	16.5	4	\$123	\$2,018	173
*Sebastian	56.9	10	\$6	\$345	34
**Yell - 1	23.4	25	\$276	\$7,110	138
*Yell - 2	67.9	15	\$24	\$1,599	85

\*Planted pure stand of brassica

\*\*Planted brassica in combination with ryegrass

## USDA and Arkansas Livestock and Poultry Commission Request the Help of Arkansas Sheep Producers in Scrapie Surveillance

*Dr. Albert Leslie, APHIS, USDA Veterinarian*

The National Scrapie Eradication Program is a cooperative state-federal-industry program administered by USDA and the states to eradicate classical scrapie. By the end of October 2012, the percentage of sheep found positive for scrapie at slaughter had decreased 94 percent since the eradication program began in 2003. In this program, each state must maintain standards and surveillance that is in compliance with the national program. Surveillance is done through the submission of specimens from eligible sheep (18 months and older) that go to slaughter or die on-farm. Surveillance goals are based on the sheep population in each state. If a state fails to maintain the necessary surveillance numbers, that state may fall out of compliance with the national program and lose the benefits of unrestricted interstate movement. This could require any sheep producer in that state selling animals across state lines to be enrolled in the Scrapie Flock Certification Program and to meet the standards of that program.

In order to increase the on-farm scrapie surveillance numbers in Arkansas, sheep producers are asked to (1) work with your veterinarians in the submission of specimens from eligible sheep (18 months and older) that die on your farm and (2) notify the USDA Veterinary Services office when you have eligible animals (18 months and older) custom butchered at local slaughter facilities so arrangements can be made for collection of specimens there.

To encourage the participation of veterinarians, USDA will pay the veterinarian \$40 per submission (\$20 per submission for additional submissions on the same day) for collecting and shipping whole-head specimens from eligible animals (18 months and older) that die on your farm. USDA furnishes shipping containers and supplies and pays the shipping costs.

Please call the USDA Veterinary Services office in Little Rock at (866) 873-2824 if you have questions. 

## Nutrition Key for Conception and Weaning Percentages

*Steven M. Jones, Associate Professor - Animal Science*

The success of a sheep and goat operation depends on the number of lambs and kids raised, weaned and marketed each year. The percentage of ewes, does, ewe lambs and doelings conceived early in the breeding season; the lambing, kidding and weaning percentages; and the percentage of ewes, does, ewe lambs and doelings lambing and kidding unassisted are some of the most important factors influencing profits in the sheep and goat business. In other words, production is equal to reproduction.

Most small ruminants are known as seasonal breeders – the female only cycles and accepts the male during times of shortening day length. Cycling usually initiates by the end of August to early September through February. If not bred, does/ewes will cycle every 21 days, similar to cows. Therefore, does/ewes should become pregnant within 4 weeks following the introduction of bucks with the herd.

The gestation length (time from breeding to kidding/lambing) averages 150 days (5 months). Yearlings may be bred in the first year at 7 to 10 months of age, depending on breed, if they have grown well and are of good size and condition. Body weight, relative to breed, is more important than age and can influence lifetime performance.

The nutritional status of a herd is the most important factor influencing reproduction. It is also the factor over which the producer has the most control by either increasing or reducing nutrient consumption. The body condition of a ewe or doe strongly affects the following:

- the time at which puberty starts
- the conception rate at first estrus in ewe lambs and doelings
- the length of the postpartum interval
- the health and vigor of newborn lambs and kids

The practice of increasing nutrient intake and body condition prior to and during breeding is called flushing. Its purpose is to increase the rate of ovulation and, thus, lambing or kidding rate. Flushing is especially beneficial for thin females that have not recovered from previous nutritional stresses such as poor forage quality, parasite infection, lactation or disease. Flushing can be accomplished

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by providing ewes or does with high quality pasture, supplemental harvested forage or grain, depending on environmental stress, availability of forage and body condition of the ewe.

Warm-season forages, such as bermudagrass or crabgrass, are an option for providing nutrition for flushing in late summer in Arkansas. They need to be fertilized and managed for appropriate volume and quality needed for flushing. Forage brassicas are one cool-season forage option available for early fall (October). Demonstration projects in Arkansas have shown that forage may be available 45 to 60 days after planting that will yield crude protein ranging from 18 to 33 percent and TDN ranging from 72 to 89 percent. The seeding cost for brassicas with annual ryegrass will be

about \$21 to \$25 per acre. Expected yield for initial grazing will be 2.25 to 2.5 tons of dry matter per acre.

Flush feeding usually begins around 2 weeks prior to breeding and continues at least 2 to 4 weeks into the breeding season. This ensures good embryo attachment to the uterus wall, reducing early embryonic death.

Body condition or changes in body condition before and during the breeding season affect reproductive performance in terms of services per conception, lambing and kidding intervals and the percentages of open ewes and does. Ewes and does should be in good body condition at lambing and kidding and should maintain good body condition during the breeding season. Bucks and rams should also be evaluated for proper body condition. 

## Body Condition Scoring of Sheep and Goats

*Steven M. Jones, Associate Professor - Animal Science*

Body condition score (BCS) has been shown to be an important practical tool in assessing the body condition of cattle, sheep and goats because BCS is the best simple indicator of available fat reserves which can be used by the animal in periods of high energy demand, stress or suboptimal nutrition.

### Goats

Scoring is performed in goats using a BCS ranging from 1.0 to 5.0, with 0.5 increments. A BCS of 1.0 is an extremely thin goat with no fat reserves, and a BCS of 5.0 is a very over-conditioned (obese) goat. In most cases, healthy goats should have a BCS of 2.5 to 4.0. A BCS of 1.0, 1.5 or 2.0 indicates a management or health problem. A BCS of 4.5 or 5.0 is almost never observed in goats under normal management conditions; however, these BCS can sometimes be observed in show goats.

It is important to note that BCS cannot be assigned by simply looking at an animal. Instead, the animal must be touched and felt. The first body area to feel in determining BCS is the lumbar area, which is the area of the back behind the ribs containing the loin. Scoring in this area is based on determining the amount of muscle and fat over and around the vertebrae. Lumbar vertebrae have a vertical protrusion (spinous process) and two horizontal protrusions (transverse process). Both processes are used in determining BCS. You should run your hand over this area and try to grasp these processes with your fingertips and hand. The second body area to feel is the fat covering on the sternum (breastbone). Scoring in this area is based upon the amount of fat that can be pinched. A third area is the rib cage and fat cover on the ribs and intercostal (between ribs) spaces.



**BCS 1.0** – Visual aspect of the goat: Emaciated and weak animal, the backbone is highly visible and forms a continuous ridge. The flank is hollow. Ribs are clearly visible. There is no fat cover, and fingers easily penetrate into intercostal spaces (between ribs). The spinous process of the lumbar vertebrae can be grasped easily between the thumb and forefinger; the spinous process is rough, prominent and distinct, giving a sawtooth appearance. Very little muscle and no fat can be felt between the skin and bone.



**BCS 2.0** – Visual aspect of the goat: Slightly raw-boned, the backbone is still visible with a continuous ridge. Some ribs can be seen, and there is a small amount of fat cover. Ribs are still felt. Intercostal spaces are smooth but can still be penetrated.



**BCS 3.0** – Visual aspect of the goat: The backbone is not prominent. Ribs are barely discernible; an even layer of fat covers them. Intercostal spaces are felt using pressure.



**BCS 4.0** – Visual aspect of the goat: The backbone cannot be seen. Ribs are not seen. The side of the animal is sleek in appearance. It is impossible to grasp the spinous process of the lumbar vertebrae, which is wrapped in a thick layer of muscle and fat.



**BCS 5.0** – Visual aspect of the goat: The backbone is buried in fat. Ribs are not visible. The rib cage is covered with excessive fat. The thickness of the muscle and fat is so great that reference marks on the spinous process are lost.

**Sheep**

While it is easy to see the body condition of a sheep when it is freshly shorn, it becomes impossible to do that by sight as the wool/hair grows. A woolly sheep can easily look in a lot better condition than it

actually is. Many ranchers are shocked at the poor condition of their sheep when they are shorn. Therefore, it is necessary to palpate (feel) each individual for accurate assessment of body condition. The animal should be standing in a relaxed position. It should not be tense, crushed by other animals or held

in a crush. If the animal is tense, it is not possible to feel the short ribs and get an accurate condition score. Place your thumb on the backbone just behind the last long rib and your fingers against the stubby ends of the short ribs.

A body condition score estimates condition of muscling and fat development. Scoring is based on feeling the level of muscling and fat deposition over and around the vertebrae in the loin region. In addition to the central spinal column, loin vertebrae have a vertical bone protrusion (spinous process) and a short horizontal protrusion on each side (transverse process). Both of these protrusions are felt and used to assess an individual body condition score (Figure 1). The system used most widely in the United States is based on a scale of 1 to 5. The five scores are:

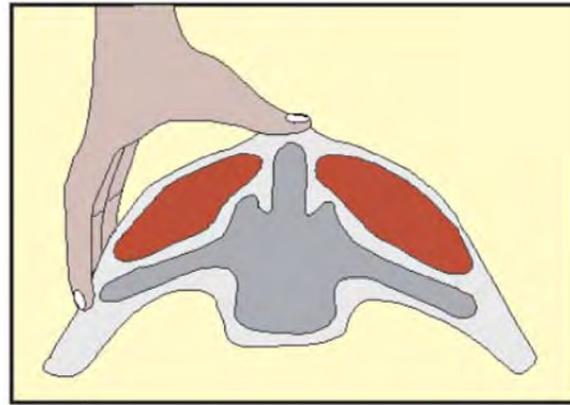
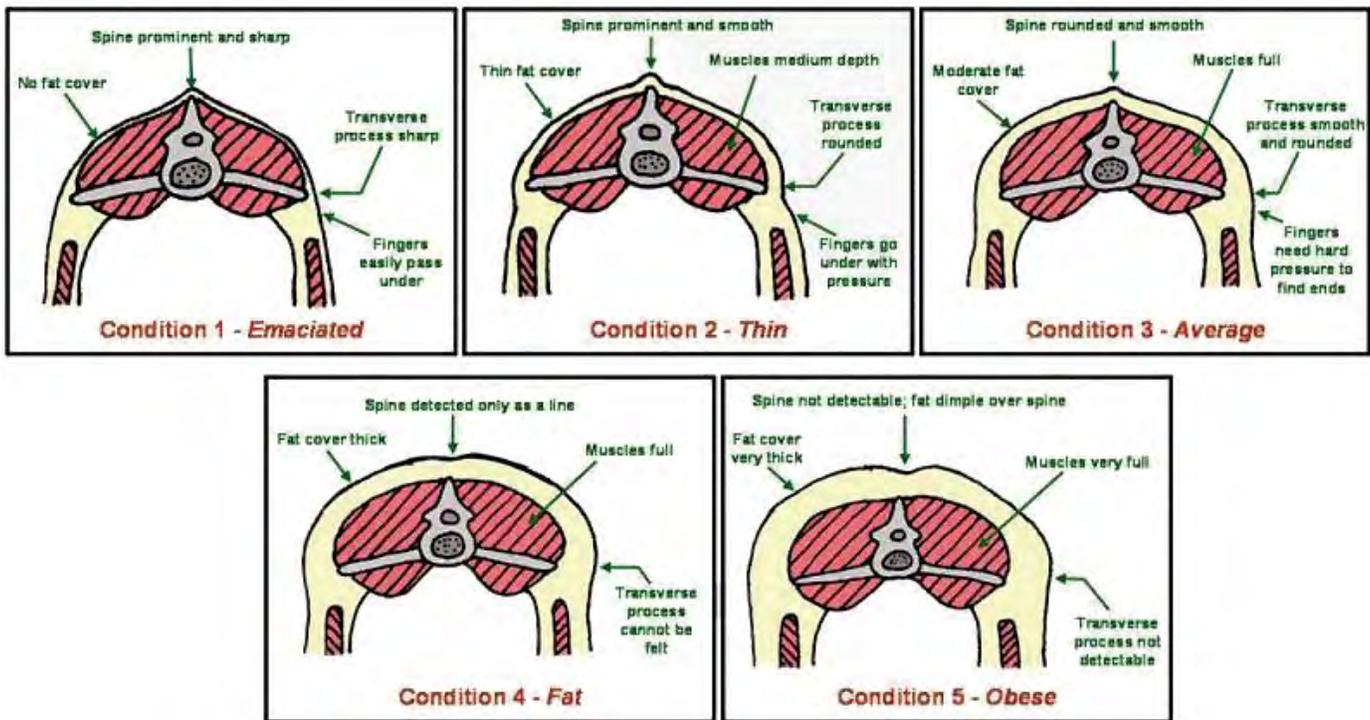


Figure 1. Vertical and horizontal bone protrusions of sheep

## Body Condition Scores – Sheep/Goats



Adapted from "Body Condition Scoring of Sheep" by J.M. Thompson and H. Meyer (Oregon State University).

University of Kentucky College of Agriculture, Department of Animal Sciences

Animals should exhibit a healthy hair coat or fleece, while maintaining a body condition score appropriate to their production stage. Both coat and body condition score are good indications of nutritional adequacy and overall health. Signs of an unhealthy animal include isolation from the rest of the herd/flock, abnormal eating habits, depression, scouring or diarrhea, abnormal vocalization, teeth grinding or any other abnormal behavior.

### References

- Dawson, Dr. Lionel. Meat Goat Herd Health Procedures and Prevention. *Proceedings of the 25th Annual Goat Field Day*. Langston University, April 24, 2010.
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- Merck Veterinary Manual, Eighth Edition*.
- Pezzanite, Lynn, Dr. Michael Neary, Terry Hutchens and Dr. Patty Scharko. *Common Diseases and Health Problems in Sheep and Goats*. AS-595-W, Purdue University.
- Thompson, J., and H. Meyer. *Body Condition Scoring of Sheep*. EC 1433. Oregon State University.
- Villaquiran, M., T. A. Gipson, R. C. Merkel, A. L. Goetsch and T. Sahl. *Body Condition Scores in Goats*. Langston University.

## Calendar of Events

**August 31, 2013:** North Missouri Meat Goat Producers, two ABGA Shows, Litton AG Center, 10856 Liv 235, Chillicothe, Missouri 64601. Entry fee \$10 due by August 24. Late entry fee \$20. No pen fee. ABGA judges Jesse Kimmel and Josh Taylor. Contact person: Tisha Diefenbach, (816) 519-1668, [tisha\\_diefenbach@hotmail.com](mailto:tisha_diefenbach@hotmail.com).

**September 7 and 8, 2013:** Southwest Missouri Boer Goat Classic, Vernon County Fairgrounds, 500 North Centennial Blvd., Nevada, Missouri. Shows at 10 a.m. and 2:30 p.m. on Saturday and 9 a.m. on Sunday. Entry fee \$20 by August 28, pen fee \$5. Judges TBA. Contact person: Marla Sneed, (417) 448-9615, [showgoats@sofnet.com](mailto:showgoats@sofnet.com).

**September 19 and 20, 2013:** Northwest Arkansas District Fair, Northwest Arkansas District Fairgrounds, 1400 Fair Grounds Road, Harrison, Arkansas 72601, Junior market meat goats and junior Boer goats. Contact person: Robert McMahan, (870) 577-1759, [robert@northarkboers.com](mailto:robert@northarkboers.com), <http://www.northarkboers.com>.

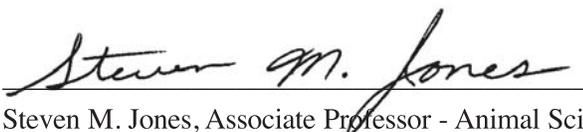
**September 21 and 22, 2013:** North Arkansas Meat Goat Association Fall Classic, Northwest Arkansas District Fairgrounds, 1400 Fair Grounds Road, Harrison, Arkansas 72601. Two ABGA-sanctioned open shows on Saturday, one on Sunday. Early entry fee \$15.00, early entry deadline September 15, late entry fee \$20. Check-in time 3-7 p.m. September 20. ABGA judges TBA. Contact person: Robert McMahan, (870) 557-1759, [robert@northarkboers.com](mailto:robert@northarkboers.com), <http://www.northarkboers.com>.

**October 11 and 12, 2013:** Arkansas State Fair, 2600 Howard Street, Little Rock, Arkansas 72206. Two ABGA-sanctioned open Boer goat shows at 9 a.m. on Friday and on Saturday after junior Boer goat show. One junior Boer goat show at 8 a.m. on Saturday. Entry fee \$12 due by September 1. ABGA judges TBA. Contact persons: Scott and Jennifer Hawthorn, (870) 246-6353, [jendh34@yahoo.com](mailto:jendh34@yahoo.com), <http://www.arkansasstatefair.com>.

**October 13 and 14, 2013:** Arkansas State Fair, 2600 Howard Street, Little Rock, Arkansas 72206. Junior market meat goat show. Judge TBA. <http://www.arkansasstatefair.com>.

**October 19, 2013:** North Arkansas Meat Goat Association meeting and pasture walk at Phil and Connie Swan's farm in Lead Hill. Details TBA. <http://www.arkansasmeatgoat.com>.

The Hope Buying Station will be **OPEN on Saturday, September 7, 9 a.m. to 2 p.m.** It will be open **2nd Saturday of each month** October, November, December, 2013, and January, February, March, April, and May, 2014. Buying Station location – 146 Hwy. 174 North, Hope, Arkansas 7180. For more information, call Chris Sweat (cell): 479-970-6905 or Jesse Duckett (cell): 870-703-7321.



Steven M. Jones, Associate Professor - Animal Science