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Contents

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Selecting Winter Annuals for Emergency Fall and Winter Pasture

John Jennings, Professor - Forage

The drought effects will be felt long after any normal rainfall arrives. Producers needing to provide quick grazing will soon be planting winter annual forages such as annual ryegrass, wheat and cereal rye. Variety selection is important. Lowest price makes some varieties appealing, but often the cheapest varieties are not the best forage producers. In fact, some of the cheaper varieties don't have sufficient cold tolerance for most of Arkansas conditions. A cheap variety becomes very expensive if it winterkills or produces very little forage growth. In a year like this, it can pay to plant known varieties to ensure forage production.

Ryegrass

For north Arkansas, cold tolerance is important. Refer to the Arkansas Plant Hardiness Zone map in Figure 1.

In a year like this, it can pay to plant known varieties to ensure forage production.

The area north of Zone 6A, 6B, 7A and even the northern fringe of Zone 7B can be cold enough for winterkill of sensitive varieties.

Annual ryegrass varieties fall into two broad genetic categories – **Diploid** varieties and **Tetraploid** varieties. *Diploid varieties tend to be more cold tolerant.* Marshall ryegrass is an example of Diploid ryegrass and is well known for its cold

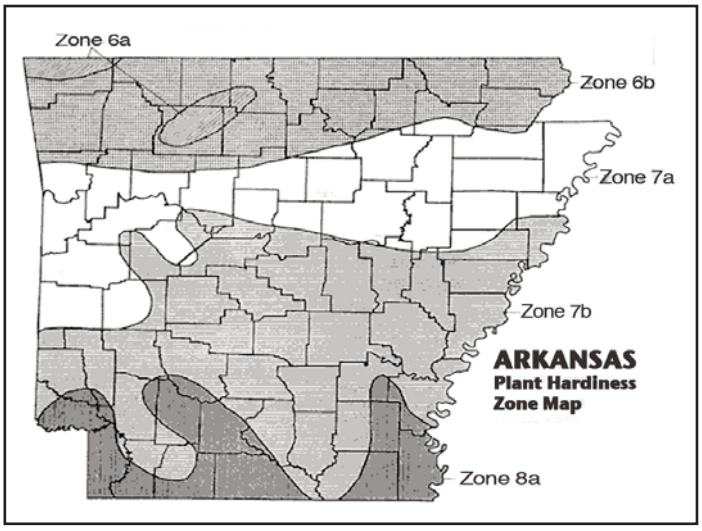

Figure 1. Arkansas Plant Hardiness Zone Map

tolerance. Tetraploid varieties have broad leaves and good disease resistance but usually are much less cold tolerant than Diploid varieties.

In Arkansas, we seldom have the disease pressure from rust and gray leaf spot found along the Gulf Coast, so the superior disease resistance of many Tetraploid varieties is not needed. In general terms, Diploid varieties should be selected for northern Arkansas. Both Tetraploid and Diploid varieties can be used in southern Arkansas. Some variation in cold tolerance exists among types, so not all Diploid varieties are cold tolerant and not all Tetraploid varieties have the same cold sensitivity. For example, *Gulf annual ryegrass is a Diploid type and is not cold tolerant.* Gulf ryegrass and VNS (variety not stated) ryegrass are not recommended for these northern areas since winterkill has been reported in previous winters. Below is a noninclusive list of annual ryegrass varieties of both Diploid and Tetraploid varieties that are being marketed.

Ryegrass can be planted as early as late August. Typical planting times for planting on a tilled seedbed begin in early September through early November. The typical planting period for sod-seeding either by no-till or broadcast methods begins in late September through early November. Early-planted ryegrass (September) can provide grazing in late fall. Late-planted ryegrass (November) will not provide significant grazing until late winter (March), except during warm winters such as 2011-12.

Seeding rate is 20-25 pounds per acre. The grass sod should be grazed or clipped to about 2 inches to improve seed/soil contact. If you are no-till planting, set the drill to plant seed about ½ inch deep. For broadcast seeding in sod, seed/soil contact will be improved by pulling a harrow, tire drag or other device to slightly scarify the sod when broadcasting the seed. Many producers pull a drag behind the broadcast seeder in the same pass to speed up the planting process.

Wheat

Most wheat varieties are selected for grain production, but an increasing number of livestock producers plant wheat for grazing purposes. Few variety trials measure forage yield, but some general observations have noted that earlier-maturing wheat varieties produce more vegetative growth in fall and late winter. The U of A wheat variety testing report provides information on relative maturity dates and mature heights of tested varieties. The link to the 2011 report is http://www.aragriculture.org/News/wheat_update/wheat_update_2011.pdf.

Some wheat varieties that have been noted for better fall vegetative growth and good grazing potential include:

- AGS 2000
- AGS 2060
- HBK 3266
- Syngenta/Coker 9553
- Syngenta Magnolia
- Syngenta Arcadia

The following wheat varieties are commonly grown for grain, but should be avoided for grazing because they produce very little fall growth:

- Ranger
- Roane
- Pat
- Pioneer 26R10
- Pioneer 26R20
- Pioneer 26R22
- Terral 8861
- Terral 8848
- Syngenta Beretta
- Syngenta Oakes
- Armor Ricochet
- Progeny 870
- Dixie McAlister

General seed price ranges are $16-$18 per 50-pound bag. Field-run and feed wheat are currently $9-$12 per 50-pound bag, but the variety or forage potential is usually unknown. An extra $5 per bag would certainly be worth the cost to get a variety that would provide more grazing.

Triticale

Triticale is a cross of wheat and rye. It has a growth pattern and yield closer to rye than wheat and makes very good forage. Paul Beck has shown good results at SWREC in grazing trials with it. Monarch is a variety that is available this year. Based on work done by Johnny Gunsaulis and Wayne Coblentz in 2005-06, this forage has the potential to make a hay or baleage crop by late November to early

Annual Ryegrass Varieties

Diploid Varieties	Company	Tetraploid Varieties	Company
Bruiser**	Ampac Seed	Angus I	DLF International
Marshall**	The Wax Co.	Attain	Smith Seed Services
Paserrel Plus**	Pennington Seed	Big Boss	Smith Seed Services
Surrey II	DLF International	Big Daddy	FFR/Sou. St.
Tam 90	Tex. Ag Exp. Sta.	Chuckwagon	DLF International
Winter Hawk**	Oregro Seeds	Jumbo	Barenburg USA
		Nelson	The Wax Co.
		Prine	East Texas Seed Co.
		Striker	Seed Research of OR

*Noninclusive list of annual ryegrass varieties
**Very good cold tolerance

December if planted in early September. Adequate rainfall will be required for establishment and growth. Any small grain that reaches the "jointing" stage of growth in fall will likely winterkill, therefore forage management should be planned to make use of early-planted varieties as hay, baleage or as strip-grazed pasture to avoid loss of dry matter.

Rye

Rye provides more fall grazing and earlier spring grazing than wheat. It grows very rapidly in March, so producers must be prepared to handle the fast growth either by grazing, as hay or as baleage. Dr. Beck's work has shown that to manage spring rye growth, half the field can be managed for grazeout and the other half can be harvested as baleage to improve forage utilization and to reduce waste. Some typical rye varieties are:

- Wintergrazer 70
- Elbon
- Maton

A variety named Rhymin rye, from Minnesota, was sold in Arkansas last fall. Producers who grew it reported good grazing and forage production. River City Seed in North Little Rock (501-374-0302) is a distributor for Rhymin rye this year.

Two distributors who sell a good selection of wheat varieties and some triticale are:

- *Stratton Seed* in Stuttgart – call Scooter Hodges at 1-870-674-4100
- *Seeds Inc.* in Memphis – call Jeff Fletcher at 1-800-238-6440

Seeding rate for small grains (rye, wheat and triticale) is 90-120 pounds per acre. For a longer spring grazing season, ryegrass can be added. Seeding rates for this mixture of 100 pounds of small grain and 20 pounds of ryegrass have been successful.

For more information on using winter annual forages for grazing, hay and silage, refer to the following fact sheets:

- FSA3051, *Baled Silage for Livestock*
- FSA3064, *Using Cereal Grain Forages and Mixtures With Annual Ryegrass for Grazing*
- FSA3063, *Using Cereal Grain Forages and Mixtures With Annual Ryegrass for Hay and Silage*
- FSA3066, *Winter Annual Grasses for Livestock in Arkansas*

Forage Brassica

Forage brassicas include turnips, kale, rape, swede (rutabaga) and radishes. Many of these have been developed for improved forage production. In an ABIP project in White County, a producer planted rape for fall grazing. Yield was favorable but low in the dry, rocky section of the field. In the field section with better soil depth and moisture, the plants grew over 20 inches tall (Figure 2). The producer strip-grazed the rape with a temporary electric wire and fed hay every second day. The cows grazed the forage extremely well. All forage was consumed with very little waste.

Figure 2. Goats grazing Appin turnips – Faulkner County Demonstration Farm

Last fall Steve Jones and Kenny Simon planted demonstration fields of forage turnips and ryegrass using different planting methods. The projects were for small ruminants and for cattle. They found that for desirable production, some soil disturbance (light disking) is required for turnips. No-till and broadcast planting onto undisturbed sod yielded very poor establishment and growth. The best growth resulted on a demonstration with a prepared tilled seedbed.

The seeding rate for full stands of turnip is 5 pounds per acre. For mixtures with small grain or ryegrass the rate should be 2-3 pounds per acre turnip with 20 pounds of ryegrass or 90-100 pounds wheat or rye.

The turnips grow very rapidly in fall. The 2011 projects were planted the last week of August and yield was measured in early November. Demonstration sites that did not receive fertilizer achieved dry matter yields ranging from 1,400 to 1,600 pounds per acre for turnips, and the ryegrass was too short to measure yield. On a demonstration site where fertilizer was applied at planting, dry matter yield for turnips was >3,000 pounds per acre and ryegrass yield was 1,200 pounds per acre dry matter.

Turnip varieties used in these projects were Pasja and Appin, both distributed by Ampac Seed, and Seven-Top turnip. Marshall ryegrass was used as the comparison. Forage yield ranking was highest for Appin and lowest for Seven-top. The forage turnip varieties also produced faster regrowth than the Seven-Top, which increases the possibility of multiple grazings. Other varieties are available; however, they have not been tested in Arkansas.

A good report on forage brassicas written by Dr. Marvin Hall is available from Penn State University at http://pubs.cas.psu.edu/freepubs/pdfs/uc100.pdf. The University of Vermont conducted Forage Brassica Performance Trials in 2010 and 2011, http://www.uvm.edu/extension/cropsoil/wp-content/uploads/Brassicareportfinal.pdf. Although Vermont's climate and

weather conditions are much different than ours, their planting and harvesting dates coincided with our planting and harvesting dates. The dry matter yield for Appin and Pasja Turnip in 2010 was similar to our yields last year with similar management. Their data indicate that Barkant turnip and Bonar rape produced similar yields to Appin and Pasja. Barkant forage turnip is distributed by Barenburg Seed, and Bonar forage rape is distributed by Ampac Seed.

Two distributors that sell Ampac seed are:

- *The Hogan Company* in Nashville, Tennessee – call Stephen Callis at 615-384-1231
- *Missouri Southern* in Rolla, Missouri – 1-800-844-1336

Determining When and How Much Winter Annual Acreage to Plant

Matching winter annual production with livestock need can be a challenge. Dr. Beck has studied planting dates and methods. The following observations will be useful for developing an emergency grazing program this fall.

Forage Brassicas

Forage turnip and rape must be planted early for fall grazing. Brassicas planted in late August to early September can produce grazeable forage by late October. Tillage is required for good establishment. Light disking may be adequate. Clean-tilled seedbeds are best. Brassicas can be grazed from October through December. An emergency grazing program could include early grazing of brassicas followed by grazing of small grain or ryegrass later in fall or winter.

Small Grains and Ryegrass

For grazing by November 1:

Small grains and ryegrass intended for grazing by early November must be planted the first week of September. Planting on a tilled seedbed or no-tilled into crop fields will be required for this to work. Apply 50 pounds per acre N after the stand comes up to ensure growth. Apply P and K according to soil test. If no soil test is available, be sure to apply at least 50 pounds each of P and K. Apply 50 pounds more N in February for sustained growth into spring. Due to the tillage requirement, this option will not fit every case or every field. However, selecting specific fields for this early planting option may fill a void until other forage is available.

For grazing by December 1-15:

Winter annuals intended for grazing in early December can be interseeded into warm-season grass sod or planted in crop fields from September 15 to October 15. Planting can be done with a no-till drill or by disking followed by broadcast of seed and dragging with a harrow. Apply 50 pounds per acre N after the stand comes up to ensure growth. Apply P and K according to soil test. If no soil test is available, be sure to apply at least 50 pounds each of P and K. Apply 50 pounds more N in February for sustained growth into spring.

For grazing by February to early March:

Planting annuals after mid-October into November will allow good establishment, but forage production will be delayed until February or early March. Fertilizer application can be delayed until February since growth potential is limited during midwinter.

How Much to Plant

Research has shown that a good measure for determining planting acreage is ⅒ acre per cow per day of the week to be grazed through the winter. For example, if cows will be limit grazed 3 days per week, then plant ⅗ acre per cow. More grazing time requires more acreage. Dr. Beck's work has shown that cows limit grazed on winter annuals 2-3 days per week and fed hay the remaining time perform quite well. In that study, the "grazing day" was an 8-hour day and not a 24-hour period. As forage growth increases during the early spring, then cows can be allowed to graze more frequently. This is a handy way to match the increased nutrient requirements of spring calving cowherds.

Fall Sprouted Corn for Hay?

An option to consider with low risk and little cost is the possibility of harvesting hay from new corn sprouts that come up after corn grain harvest. County agents say that corn producers are considering smoothing fields after corn harvest to allow any spilled or waste grain to sprout.

Dr. Jason Kelley says that corn grain losses during harvest can range from 1 to 5 bushels per acre. One bushel per acre equates to two seeds per square foot. In some cases, corn sprouts can reach over 3 feet in height by mid-October. Forage quality of this material as hay would be similar to sorghum/sudan hay and would not likely have chemical restrictions associated with the main crop harvested earlier.

Some precautions for both cattle and crop farmers should be considered. This material still has the potential for accumulating nitrate and should be tested before harvesting for hay to determine if it is safe for livestock. Additionally, the crop farmer should consider the amount of phosphorus and potassium that the hay crop will remove from the soil that could add to production costs the following year.

High Summer Temperatures May Impact Early Fall Breeding Season Fertility

David Fernandez, Extension Livestock Specialist

As the fall breeding season approaches, producers should be aware that this summer's high heat may have affected the fertility of their bucks and rams. Most male mammals' testes are located in the scrotum outside their bodies. The scrotum allows the male to maintain his testes at a temperature several degrees below his body temperature. This is essential for sperm production. When ambient temperatures exceed 103°F for several days, the testes cannot be cooled and sperm production can be impaired.

The damage done to sperm production can have long-lasting effects. From start to finish, sperm production in the ram requires, on average, 47 days plus another 9 days for the sperm to migrate to storage areas, for a total of 56 days. Similar timeframes are believed to exist for the buck. The damage is not always readily apparent. In some cases, the actual number of sperm and their motility may be reduced (Foote, 1978). However, much of the time the damage appears to be done to the DNA of the sperm. This means a buck or ram may appear to be normally fertile after a breeding soundness exam, but pregnancy rates of does and ewes may be low, with many repeat breeders. The problem is compounded by the effects of high heat on female reproduction. When temperatures are elevated, eggs ovulated by the female may be less fertile and may not survive to form a viable embryo after fertilization (Fuquay, 1981). Fortunately, the effect of high temperature on females tends to be limited to the estrus cycle in which it occurs.

> The best thing to do is to provide plenty of cool water and shade to help your livestock keep cool, and take extra care to monitor your herd's nutrition.

Heat also affects reproductive behavior. Ewes and does subject to high temperatures are less likely to exhibit estrus and more likely to ovulate without any external signs, commonly known as a silent heat. Rams and bucks are also less active and may not mate females when temperatures are high.

Unfortunately, there is no cost-effective on-farm method to determine whether the problem lies with the male or female. The best thing to do is provide plenty of cool water and shade to help your livestock keep cool. Take extra care to monitor your herd's nutrition, as they may not consume enough feed when days are extremely hot (Appleman and Delouche, 1958). Finally, plan ahead so you can be prepared if your breeding season starts and ends later than usual. You may need to investigate alternative marketing strategies and parasite management schemes for next spring and summer.

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Appleman, R.D., and J.C. Delouche. 1958. Behavioral, physiological and biochemical responses of goats to temperature, 0° to 40°C. *J Anim Sci* 17:326-335.

Foote, R.H. 1978. Factors influencing the quantity and quality of semen harvested from bulls, rams, boars and stallions. *J Anim Sci* 47:1-11.

Fuquay, J.W. 1981. Heat stress as it affects animal production. *J Anim Sci* 52:164-174

How Much Hay Will Be Needed?

John Jennings, Professor - Forage
Shane Gadberry, Associate Professor - Ruminant Nutrition
Steven M. Jones, Associate Professor - Animal Science

Producers trying to purchase enough hay to feed their flocks need some guidelines to help them estimate hay needs. A general rule of thumb is that a dry doe/ewe will need to eat about 3 percent of her body weight per day in forage dry matter, assuming that forage meets nutritional requirements. Normal maintenance is slightly below this level, but considering we are either breeding or in early gestation in the fall and early winter, nutritional requirements go up. So a 100-pound nonlactating doe/ewe will consume 3 pounds dry forage per day. But when you factor in moisture content of the hay and hay waste during feeding, more hay is required. For example, if the hay moisture content is 12 percent and 20 percent is wasted during feeding, the daily amount of hay for that 100-pound female is closer to 4 pounds.

How many bales to purchase is an important question. Bale weights vary considerably with bale size, forage type, moisture content, baler and operator.

In many hay-weighing demonstrations we have found that *estimates* of hay weight almost always *exceed* actual weights when the bale is placed on the scale. Small square bales can vary between 45 and 70 pounds. Most small squares we have weighed are approximately 55 pounds. The average weight for a typical 4x5 large round bale is approximately 750 pounds. We have weighed some much lighter and some heavier. Weights of 1,000 pounds for 4x5 round bales are uncommon. A 5x6 round bale has 1.8 times more volume than a 4x5 round bale and can reach a weight over 1,300 pounds.

Below is a set of guidelines for the daily amount of hay needed for various weights and flock sizes for prebreeding/early gestation females. These values assume that hay quality is sufficient to meet nutritional requirements. Feeding more poor quality hay will not overcome the nutrient deficiency because a sheep or goat cannot eat more low quality hay. As quality decreases, intake is suppressed.

Amounts may be adjusted for superior quality hay or when supplemental feed or grazing are added to the ration.

Amount of Hay (Lbs)* Needed Per Day For Feeding Different Size Small Ruminant Flocks

	Body weight (prebreeding/early gestation)		
	100 lbs.	120 lbs.	150 lbs.
Number	Amount of hay per day (lbs)		
25	107	128	160
50	214	256	320
100	428	512	640

*assumes hay at 12% moisture and 20% waste during feeding

Monitor Herd Nutrition and Body Condition to Optimize Reproductive Success

David Fernandez, Extension Livestock Specialist

Poor reproductive performance is the number one cause of financial losses on livestock farms, and the top contributor to poor reproduction is poor nutrition. With pasture conditions in Arkansas at their worst in decades, many of our sheep and goats are entering the fall breeding season in less than ideal body condition.

In ewes, adequate nutrition is essential for puberty to occur (Schillo, 1992). Puberty in Boer does can be delayed by poor nutrition (Greyling, 2000). Ewes that are in poor body condition release fewer eggs at ovulation and are less likely to become pregnant (Thomas et al., 1987). Rams that lose weight have reduced sperm output and testicular size, but are usually able to produce enough sperm to impregnate ewes (Dunn and Moss, 1992). In cases of extremely poor nutrition, embryonic survival can be jeopardized in ewes.

High temperatures also contribute to poor nutrition. Heat-stressed goats spend 90 percent less time grazing and chewing their cud than unstressed goats (Appleman and Delouche, 1958). However, they spend a much greater proportion of the day drinking when temperatures are elevated. Producers should provide plenty of shade and water to help their livestock keep cool and improve reproductive success.

Producers can take advantage of the "flushing" effect in ewes and to a lesser extent in does. By providing a high level of nutrition for at least two weeks before the breeding season commences, ewes will exhibit more multiple ovulations and are more likely to become pregnant. The results of flushing goats are less clear. Some research supports the beneficial effect of flushing, while other research shows little to no effect.

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Dunn, T.G., and G.E. Moss. 1992. Effects of nutrient deficiencies and excesses on reproductive efficiency of livestock. *J Anim Sci* 70:1580-1593.

Greyling , J.P.C. 2000. Reproduction traits in the Boer goat doe. *Small Ruminant Res* 36:171-177.

Schillo, K.K. 1992. Effects of dietary energy on control of luteinizing hormone secretion in cattle and sheep. *J Anim Sci* 70:1271-1282.

Thomas, D.L., P.J. Thomford, J.G. Crickman, A.R. Cobb and P.J. Dziuk. 1987. Effects of plane of nutrition and phenobarbital during the pre-mating period on reproduction in ewes fed differentially during the summer and mated in the fall. *J Anim Sci* 64:1144-1152.

Calendar of Events

September 8: Artificial Insemination Demonstration, Langston University; http://www.luresext.edu/goats/extension/AIregLU09082012.pdf.

September 8-9: Southwest Missouri Boer Goat Classic, Vernon County Fair Grounds, 500 North Centennial Blvd., Nevada, Missouri. Shows at 10 a.m. and 3 p.m. on Saturday and 9 a.m. on Sunday. Entry fee $10 by August 29, pen fee $5. Judges TBA. Contact person Marla Sneed, (417) 448-9615, showgoats@sofnet.com.

September 8-9: Southeast Missouri Showdown, Arena Park, Cape Girardeau, Missouri. ABGA-sanctioned open shows, ABGA Judges TBA. Contact (573) 334-9250, http://www.semofair.com.

September 8, October 13, November 10 and December 8: Goat and Sheep Producers Buying Station, Duckett Farms, 146 Hwy 174N, Hope, Arkansas, 9:30 a.m.-2:30 p.m. Contact Jesse Duckett, (870) 703-7321.

September 21-22: Northwest Arkansas District Fair, Northwest Arkansas District Fair Grounds, 1400 Fair Grounds Road, Harrison, Arkansas 72601, Junior Market Meat Goats and Junior Boer Goats. Contact person Robert McMahen, (870) 557-1759, robert@northarkboers.com, http://www.northarkboers.com.

September 21-22: Northwest Arkansas District Fair, Junior Market Meat Goats and Junior Boer Goats. Contact person Robert McMahen, (870) 557-1759, robert@northarkboers.com, http://www.northarkboers.com.

September 23-24: North Arkansas Meat Goat Association Fall Classic, Northwest Arkansas District Fair Grounds, 1400 Fair Grounds Road, Harrison, Arkansas 72601. Two ABGA-sanctioned open shows on Saturday, one on Sunday. Early entry fee, $15, early entry deadline, September 17; late entry fee, $20. Check-in time 3 to 7 p.m., September 23. ABGA judges TBA. Contact person Robert McMahen, (870) 557-1759, robert@northarkboers.com, http://www.northarkboers.com.

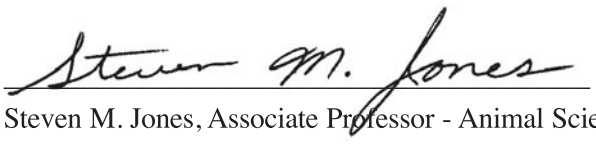
October 12-13: Arkansas State Fair, 2600 Howard Street, Little Rock, Arkansas 72206. Two ABGA-sanctioned open Boer goat shows at 9 a.m. on Friday and 9 a.m. on Saturday; one junior Boer goat show on Saturday after open show. ABGA judges TBA. Contact persons Scott and Jennifer Hawthorn, (870) 246-6353, jendh34@yahoo.com, http://www.arkansasstatefair.com.

October 14-15: Arkansas State Fair, 2600 Howard Street, Little Rock, Arkansas 72206. Junior Market Goat Show; http://www.arkansasstatefair.com.

October 20: North Arkansas Meat Goat Association Meeting and pasture walk at a member's farm. Starts at 9:30 a.m.

October 20: Training Clinic: Artificial Insemination for Goats, Antlers, Oklahoma, (580) 286-2574, Ext. 2 (Idabel) – Carl Henderson or (405) 466-6126 (Langston) – Terry Gipson

November 8: Goat Field Day, Tin Can Hill Ranch near Damascus (a.m.) and Cannon Ranch (p.m.) in Drasco.



Steven M. Jones, Associate Professor - Animal Science