Brush Utilization on the Rio Grande Plains

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The Texas Rio Grande Plains include 22 million acres of land, 93% of which has a moderate to dense brush cover (Figure 1). The *Prosopis-Acacia* dominated mixed brush complex (mesquite, blackbrush, guajillo, catclaw, granjeno) is home to numerous white-tailed deer, other wildlife species, and supports a large cow/calf industry. The brush limits cattle carrying capacities to 1 Animal Unit (A.U.)/30–40 acres. Herbaceous production in the area averaged only 500 lbs/acre (air dried) on five locations in 1985.

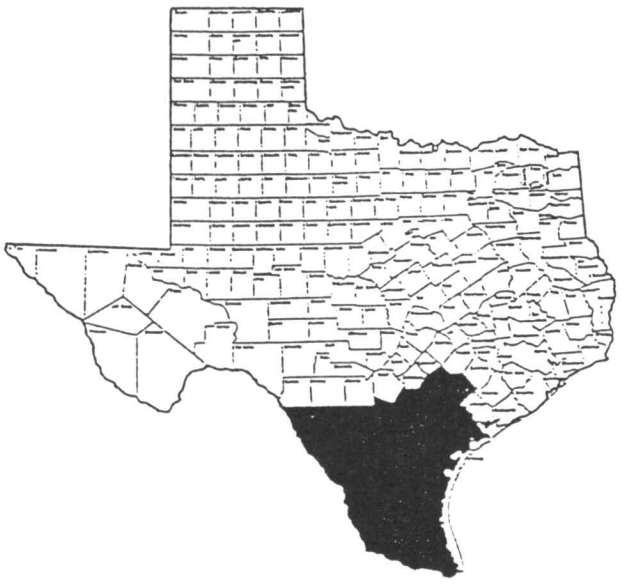

Fig. 1. *The Rio Grande Plains of South Texas.*

Consequently, ranchers have burned, grubbed, cut, shredded, plowed, and poisoned brush for over 90 years trying to reduce the brush cover and grow more grass for their cattle. Early attempts at eradication failed. An era of "control" began in the the 1950's and the "management" era began in the mid-1960's. Recognizing the importance of brush as wildlife habitat, the use of brush by cattle, importance of biodiversity and alternative options for rangeland uses, ranchers have continued to incorporate brush management into their operations.

Management of brush involves manipulation of densities, species composition, stature, and architecture of brush stands to meet range management objectives. This may involve modifying brush stands by seeding or transplanting, or reducing stands with treatments of fire, chemical, mechanical, and/or biological technologies. Sequential treatments of one or more of these methods may be necessary to maintain brush at desired levels.

Most brush management practices in the Rio Grande Plains have been focused on reducing or thinning brush stands. The expense and other disadvantages of traditional methods has forced a reevaluation of a biological method—the use of goats to suppress brush. A logical extension of this concept is to utilize brush with livestock, manage it as a renewable resource, and market it in the form of livestock products. Goats have long been used to convert roughages to meat, milk, fiber, tallow, and leather on a world-wide basis. However, their use in a viable livestock industry and as a range management tool has just begun to gain wider acceptance in the U.S.

The Status of Spanish Goats in South Texas

Goats have browsed south Texas rangelands since the earliest Spanish settlements in the late 1600's and early 1700's and were raised for meat and milk (Figure 2). These goats, in contrast with Angora goats raised for mohair production, are often called Spanish goats, but are also known as meat, brush, criollo, wood, or common goats. Recent estimates place the present Spanish goat population in Texas at 330,000 head worth over $4 million. Most Spanish goats in the region are located in two tiers of counties near the Rio Grande bordering Texas and Mexico (Mercado et al. 1991). Depending upon location, 5%–13% of the ranchers in this area report having meat goat enterprises for sale and for producing meat for personal use. However, over one-third keep Spanish goats strictly for a brush management. This is not surprising when over half of a typical South Texas ranch is brushy rangeland (Figure 3). Although many producers initiated their Spanish goat enterprises strictly for brush control purposes, most have begun to include utilization of brush and marketing goats as a range resource.

Biological Brush Utilization on the Vaquillas Ranch

Gene "Primo" Walker, Jr. of Mirando City, Texas, is such an individual. The Walker family owns and operates San Mateo Select "Natural" Cabrito, a business based upon utilization of range brush with meat goats.

The Walker's Vaquillas Ranch is in the heart of the brush country about 50 miles east of Laredo near the Mexican border. Gene began experimenting with Spanish goats for brush control in 1978 but now considers brush utilization as a major objective. He now has over 2,000 breeding nannies in two locations used to produce "cabrito" (milk-fed kid). His management allows the goats to keep the brush in check but maintains the most

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Fig. 2. *Spanish goats are well adapted to brushy range conditions.*

desirable species as a forage base for the goats and white tailed deer.

The original herd of 1,000 nannies browse on a 1,600-acre pasture divided into several smaller pastures. Another 1,000 nannies now browse four, 500-acre pastures at a separate location on the ranch. These pastures support a dense cover of mixed brush including mesquite, blackbrush, guajillo *(Acacia berlandieri)*, guayacan *(Porlieria angustifolia)*, and numerous other species. Goats prefer guajillo over other brush but will also consume large amounts of blackbrush, persimmon *(Diospyros texana)*, and colima *(Zanthoxylum fagara)*. Studies in Mexico and southern Texas report that over 50% of the annual diet of the Spanish goat is composed of leaves and stems of various brush species (Garcia G. et al. 1989, Warren et al. 1984). Goats also relish mast such as mesquite beans and pricklypear "tunas".

Walker uses a decision-deferred grazing strategy for both Spanish goats and cattle. Grazing periods are determined by evaluating both forage and animal condition. Goats and cattle are rotated together through the system of small pastures. White-tailed deer will move either ahead of or behind the goats and "goating" does not appear to interfere with the production of quality deer on the Walker ranch.

Regional research is showing that continuous heavy grazing is detrimental to the brush as a forage base and to the nutritional plane of the goats. Heavy grazing is also detrimental to white-tailed deer populations. Stocking rates of 1 goat/.5 acre for 5 months completely removed all leafy material below a 5-ft browseline on an experimental pasture near Kingsville, Texas. However, continuous grazing at 1 goat/1-1.5 acres did not have any visible negative effects. Heavy stocking rates are necessary for brush control but more moderate stocking levels are required when other uses (i.e., a forage base for livestock or wildlife habitat) are considered. Walker uses ca. 1 goat/1-2 acres depending upon vegetation conditions. However, stock densities may range from 1 goat/.25-.5 acres for short periods of time in order to have a greater impact on the brush. The most desirable plants are browsed heavily very quickly. Since cattle prefer grasses, stocking rates will vary from 1 A.U./30 acres to 1 A.U./50 acres on the Walker Ranch, depending upon range site.

Regrowth brush is generally higher in digestible nutrients and palatability. Two small traps for kidding in the goat pastures on the Vaquillas ranch have been roller chopped and/or shredded, leaving mottes of intact brush for cover. The goats have browsed the treated brush extensively over the past 4 years, maintaining the height at 3 ft.

A diet predominantly composed of brush plants is usually low in energy (Holloway and Varner 1985). Also, droughts and freezes lower forage availability and quality. These conditions necessitate a supplemental feeding program. Gene feeds singed pricklypear during stressful times. Grazing rotations are halted and pricklypear is fed until the rains come again. He continues to burn "pear" even on fresh pasture so that the goats can make the transition to other forages themselves. Goats are fed coastal bermudagrass or buffelgrass hay during the winter months. The major poisonous plant in this area is coyotillo *(Karwinskia humboldtiona)* but it has caused only a few problems.

Fencing and Predators

The major problems limiting goat production in this

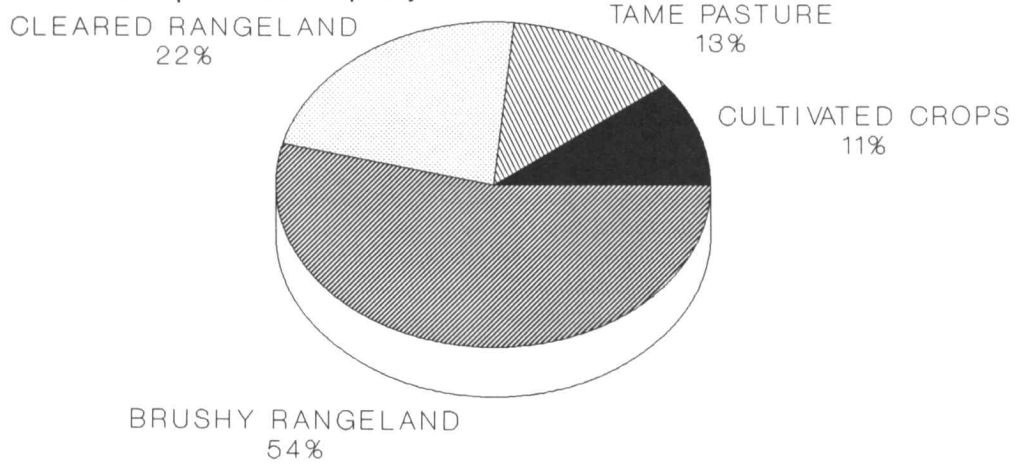

Fig. 3. *Land types ranched by the typical South Texas Spanish goat producer.*

area are usually poorly designed fencing and an abundance of predators. Walker's fencing consists of 12-inch stay netwire on perimeters and along lanes. Spanish goats will get their heads and horns caught in 6-inch netwire so the larger size is preferred. Electrical fencing works well but requires special designs, maintainence, and behavioral adaptation by goats. Gene prefers to use additional strands of barbed wire on original 4–5 strand barbed wire fences.

Since the brush country is the "coyote capital of the world", predators are a major problem. There are more coyotes per square mile in the region than anywhere else in North America. Bobcats also are numerous. One predator avoidance strategy in the region is the use of guard animals (usually dogs). Four to five guard dogs/800 nannies are used on the Walker ranch. Mongrels are preferred by Walker and other area ranchers. Pups are bonded soon after birth to nannies by allowing them to nurse the does. They are also kept separated from other dogs. As dogs mature they bond to the goats, but their canine traits surface when the herd is threatened by a predator. The dogs stay with the goat herd at all times. When the herd moves to the protection of corrals at night, the dogs will constantly check for danger. Predation is usually heaviest early in the morning after the dogs have been awake most of the night and are sleepy. Predation is also lessened by reducing coyote populations in the pastures on the Walker Ranch by the use of snares. Buffer and other prey species (e.g., quail, cottontail rabbits, jackrabbits, and rodents) are encouraged as an alternative coyote food supply. A "pastor" (herder) is also employed to daily check over the herd and to assist with kidding to discourage predation when the goats are most vulnerable. Another predator avoidance strategy is the adjusting of kidding to avoid coyote whelping seasons.

Management of the Spanish Goat Herd

Walker breeds his nannies 3 times/year but most of his does kid three times every two years. Kidding seasons in the spring, summer, and fall are synchronized to coincide with regional ethnic and religious holidays and subsequent high cabrito meat demand.

Thirty-five acre kidding pastures each hold about 300–400 nannies during the kidding season. These traps have some patchy, dense brush mottes that the does use as cover to birth their kids. About 1 week before kidding, all pregnant nannies are placed in these traps and stay there until the kids are born. After kidding, the nannies are placed back in the herd and the kids are tethered on a stake in a small trap by the corrals (Figure 4). This allows the kids to remain separate so their scents do not comingle and the does can easily identify their offspring for nursing in the evenings. After bonding is complete in 3–4 days, the kids are released from their tether. The kids are marketed at 45–50 days of age so they are never exposed to predation in the main pastures. Walker markets kid crops ranging from 100–225% per year depending upon the year and season.

Fig. 4. *Kids are separated from their cohorts at birth to allow dam-kid bonding.*

Selection, culling, and replacement programs; parasite and disease control; reproduction management; and a good marketing program complement Walker's range management efforts. However, the nutritional basis for the Vaquillas Ranch Spanish goat herd is rangeland vegetation—primarily brush. Gene Walker is using a previously undesirable and underutilized resource to sustain a profitable and unique rangeland enterprise. This is a classic example of integrated resource management on the Rio Grande Plains of South Texas.

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