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TARGETED GRAZING WITH GOATS AND SHEEP

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INTRODUCTION

Woody plant encroachment, or the transition of grass-dominated rangelands to shrublands or forests, is the single greatest threat to livestock production in the Southwestern Great Plains. This transition reduces forage production, diminishes biodiversity, and has impacts across all aspects of land management. Historically, woody plant encroachment was mitigated by wildfires and grazing/browsing by native wildlife species (e.g., bison, deer, and other). The use of targeted and multi-species grazing such as sheep and goats (Fig. 1) is a cost-effective method of managing woody plant encroachment on rangelands—in combination with other brush management practices. By utilizing targeted grazing and multi-species grazing, producers are able to mimic historic processes that keep undesirable brush in check and optimize range productivity.

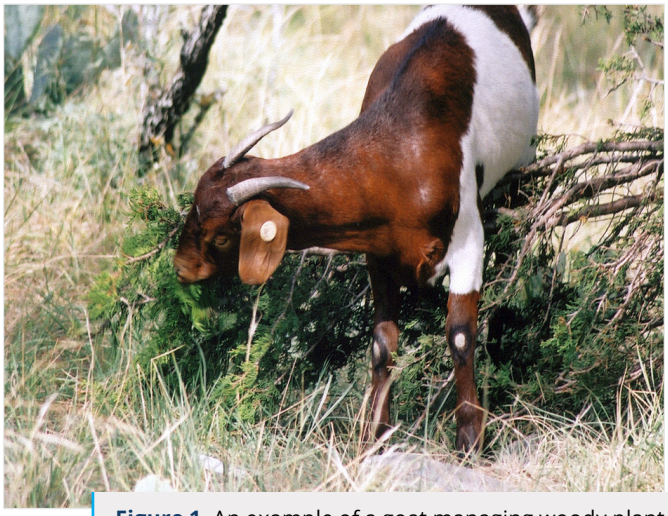

Figure 1. An example of a goat managing woody plant encroachment on a rangeland.

TARGETED GRAZING AND MULTI-SPECIES GRAZING

Targeted grazing is defined as the application of livestock grazing to achieve specific management goals. This differs from traditional grazing management by treating the use of livestock as a tool to manage other vegetative species, rather than just as an operational goal. To be successful, targeted grazing requires:

- Determining the goals and desired outcomes of each management area.
- Identifying the vegetative species of concern within that area.
- Tailoring the livestock species composition and stocking intensity to achieve those goals.

Targeted grazing is often used as a long-term approach to address prior land management problems. When applied correctly, targeted grazing can help restore degraded land, improve wildlife habitat, and enhance ecosystems. A single application of targeted grazing may not be enough to address prior land mismanagement. Multi-year targeted grazing systems are more likely to have long-term success, improve ecological function, and enhance the management of undesirable plant species.

MULTI-SPECIES GRAZING

Multi-species grazing is the utilization of two or more species of herbivores to graze or browse an area. The most commonly used livestock in multi-species grazing are goats, sheep, and cattle. When these species graze together, forage utilization and efficiency increase due to the differences in diets between livestock species.

For example: Cattle tend to be less selective grazers when compared to sheep and goats. This is because they possess wide mouths, flexible tongues, and a browsing pad that works to tear material from the plant. Additionally, cattle tend to graze somewhat higher on forage plants while sheep tend to graze closer to the ground. A typical cow diet consists of 81 percent grass, 12 percent forbs, and 7 percent browse (Fig. 2).

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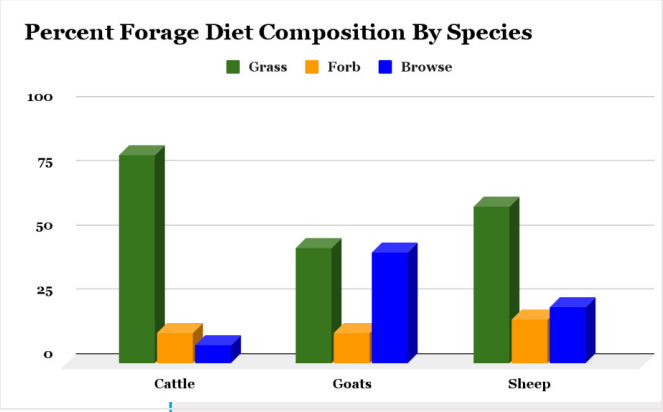

Figure 2. Graph of forage diet composition for cattle, goats, and sheep.

Goats and sheep tend to be more selective grazers due to their flexible lips, which allows them to choose individual plants and plant parts. A typical goat diet consists of 45 percent grass, 12 percent forbs, and 43 percent browse, whereas the typical sheep diet consists of 61 percent grass, 22 percent browse, and 17 percent forbs (Fig. 2). Goats will eat grasses and ground-level weeds, but they inherently prefer eating easy-to-reach woody plants. Sheep will eat woody vegetation, but they ultimately prefer eating forbs, legumes, grass, and other pasture plants.

Together, grazing sheep and goats increase the utilization of forbs and browse in a pasture while reducing grazing pressure on grasses for a given stocking rate. In addition, the utilization of multiple species may improve overall forage utilization on rugged or diverse topography. Goats and sheep are better adapted to grazing on steeper, rockier areas of land, whereas cattle prefer to graze upon flatter areas.

GOATS AND SHEEP IN TARGETED GRAZING OPERATIONS

Goats

Using goats for targeted grazing can serve as an effective ecological tool for controlling weeds and woody plants. Goats are often the species of choice for targeted grazing operations simply because they are highly adaptable to a multitude of ecosystems and have browsing habits that make them effective at removing undesirable woody and otherwise unpalatable plants. For example: Goats have an inherent preference for consuming plants that other species find unpalatable such as poison ivy, junipers, greenbrier, and sericea lespedeza. Goats are also effective at managing woody plants by stripping the bark off tree trunks, which can kill the tops of woody vegetation that is greater than 7 feet tall. Additionally, persistent browsing of foliage will stress the plant and may kill the brush. Through these efforts, goats can reduce costs on herbicides and generate secondary farm income through breeding and sale of animals to wholesale and retail markets.

Sheep

Sheep play an important role in targeted grazing by managing forbs and grasses. Many small-acreage landowners stock sheep due to their size and their innate preference to consume undesirable forbs mixed within desirable forage. Sheep are commonly used in production systems such as vineyards, hopyards, orchards, and other sites where grass and forbs dominate (as opposed to woody species). In addition to their use in agricultural production, sheep are also used in agrovoltaic operations—solar grazing operations around solar power facilities. On these sites, well-managed grazing by sheep can improve the soil health and promote beneficial vegetation cover while reducing operation costs from mowing or herbicide.

Expected Results

Before deciding to integrate different livestock species, it is important to understand a property's forage production and carrying capacity. This is the foundation for calculating stocking rates and intensity of grazing within a management area. Correctly stocking a pasture is critical to maximize the benefits of targeted grazing while minimizing the negative impacts of over-grazing.

Information on how to calculate carrying capacity and stocking rate may be found in the AgriLife Extension publication, *Stocking Rate: The Key Grazing Management Decision* (RWFM-PU-060). A targeted grazing operation, when planned accordingly, should result in the decrease of unfavorable plants. Likewise, a multi-species grazing operation, with proper stocking rates, should result in multiple types of plants being eaten. As a result, when correctly stocked, the use of targeted multi-species

grazing with cattle, sheep, and goats can significantly reduce the amount of undesirable target plant species, while reducing the over-utilization of desirable forage species and increasing the overall plant species richness and diversity. Additionally, potential benefits may include reduced livestock parasite loads, diversified income, increased individual animal performance, increased stocking rate, pasture utilization, pasture quality, and weed and brush control.

Challenges

Challenges to a multi-species grazing operation include increased complexity in managing herd health and nutrition. This may manifest in increased susceptibility of internal parasites in sheep and goats (i.e., barber pole worm). Also, in targeted grazing scenarios, there may be no water available on location, in which case water has to be hauled. Another challenge in multi-species operations that are not watering out of ponds and using water troughs—where many are already suited for cattle—is they are often too tall for small ruminants (e.g., goats and sheep). Thus, alterations to the water system may be needed. Additionally, managing the micro-nutrient needs of mixed-species herds will also require additional mineral feeding facilities and planning to ensure each species has access to the mineral they need.

Predation on sheep and goats by bobcats, wild pigs, coyotes, stray dogs, and mountain lions is also a notable challenge. These risks can be mitigated through the use of livestock guardian dogs (LGDs), active herd management, and having good fencing in place. Understanding that predation is a threat for livestock loss, and how that loss will be managed and reduced, is an important component in the viability of long-term grazing operations with small ruminants.

Fencing and facilities (if not adequate already) will need to be upgraded to meet the needs of multiple ruminant species on the operation. Permanent wire fencing is the most expensive but longest-lasting capital expenditure for an operation—although less expensive electric fencing may suffice for short-term targeted grazing applications.

Finally, it is important to understand that timing the use of targeted grazing is critical but also variable. Factors such as drought, seasonal changes in first/last frost dates, and other climatic factors can change the ideal timeframe for implementing targeted grazing. For example: If targeted grazing is implemented too early in the season or is not used long enough, the undesirable vegetation being targeted may regrow and lose much of the progress made by the livestock. Another example: Late in the warm growing season, the overall palatability and digestibility of annual grasses and weed species may decline, as the plants mature and reduce the amount of grazing pressure those plants are under.

OWNING VERSUS CONTRACTING

Targeted grazing using goats and/or sheep relies on either the purchase or leasing of animals to achieve the desired land management outcomes. Owning the livestock used for targeted grazing requires higher initial input costs and capital investments, from fencing and handling/care facilities, as well as overall risk in market fluctuations. Additionally, managing a herd brings with it the costs of maintaining the health, nutrition, and predation of those animals. With good management, these costs can be offset by actively breeding and selling kids or lambs (i.e., baby goats) and adult individuals.

Leasing goats has a lower barrier to entry risk, but it may still require fencing on-site or negotiations to include temporary fencing in the lease contract. These costs vary wildly, with some goat operations charging $20 per goat, per day, while others charge $700 to $850 per 3 to 4 goats on a weekly basis. The main cost considerations: The distance to deliver the animals and the number of acres under contract. In comparison, contracts for brush or weed control treatments can be more expensive, whereas a contractor using mechanical removal of brush may charge anywhere from $100 to $500 per acre of clearing, and herbicide brush treatments may run from $20 to $250 per acre base price plus cost of herbicide (Klose et al., 2020). Leasing can be particularly effective for properties or operations that lack adequate fencing, livestock experience, or other barriers that may prevent a producer from implementing targeted or multi-species grazing themselves.

SUMMARY AND CONCLUSIONS

Targeted grazing using sheep and goats (or combinations of two or more species) can be an effective way to manage vegetation for a variety of goals. Targeted grazing

consists of a different business model than simply grazing for livestock production. Effective targeted grazing focuses on impacting target vegetation at exactly the right time for specific landscape or vegetation goals. Given the ever-present threat of wildfire, many landowners and land managers are considering hiring targeted grazing contractors to help decrease wildfire fuel loads, manage invasive species, and browse resprouting woody brush species such as redberry juniper.

Using sheep and goats through targeted grazing offers a number of important advantages:

- Sheep and goats trample vegetation and they transfer nutrients through defecation and urination, which facilitates the breakdown of plant carbon in the soil.
- Cost-effective vegetation management alternative, where other options are ineffective (e.g., steep, rocky or rural, remote areas).
- By controlling competing vegetation at critical times, targeted grazing can enhance habitat restoration efforts.
- Targeted grazing can be a cost-effective alternative for reducing fine and ladder fuels over large and rugged landscapes that may be inaccessible for equipment or hand crews.
- Targeted grazing is especially effective at maintaining fuel reduction treatments like shaded fuel breaks.
- Unlike many treatment methods, targeted grazing actually removes fuel from the landscape—the wildfire fuels are removed by the grazing/browsing livestock.
- Targeted grazing contractors can often provide all necessary infrastructure (e.g., fencing, livestock water, predator protection, and other).

By managing the type and number of animals, the duration and intensity of grazing, the season and frequency of grazing, and the spatial distribution of livestock, targeted grazing with sheep and goats can help landowners and managers achieve a variety of land management goals.

RESOURCES

Contract Grazing Opportunities

Opportunities to hire or provide contract grazing services may be found at the following webpages:

- *https://www.rentaruminant.com/*
- *https://hiregoats.com/*
- *https://goat-rental.weebly.com/*
- *https://matchgraze.com/*
- *https://www.midwestgrazingexchange.com/*
- *https://www.goatsonthego.com/*
- GoatScaping LLC: *Info@goatscapingllc.com*

This list is neither an endorsement or recommendation for any particular business or service by the Prairie Project or its affiliated organizations and is provided to the public as an example of resources available.

REFERENCE

Klose, S., Smith, J., Waller, M., Keeling, W., Abello, P., Thompson, B., Zapata, S., & Benavides, J. (2020). *2020 Texas Agricultural Rates Survey*. Texas A&M AgriLife Extension Service. *https://agecoext.tamu.edu/wp-content/uploads/2020/07/TXCustomRatesSurvey2020.pdf*.

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Additional information on utilizing multi-species grazing is available from the Prairie Project at: Multi Species | The Prairie Project.

To learn more about The Prairie Project research stations that are actively studying the effects of prescribed fire and goats, please visit: *https://www.theprairieproject.org/about-us/research-stations*.