

Management of Goats for Controlling Noxious Weeds: A Primer

*Shannon Williams, University of Idaho Lemhi County Extension Educator
Bonnie Jensen, Owner, Weed Goats 2000, Salmon, Idaho*

Goats can be used as an effective tool for noxious weed management because of their preference for particular weeds. They can be used in areas where other management methods may not be efficient, effective, or allowed. They can also be quite effective when used in combination with other weed control measures.

Grazing for noxious weed control requires a multi-year commitment. Although grazing does not immediately kill noxious weeds, it reduces seed production and growth, and stresses the plant. Each time the top of the plant is removed, it forces the root to use its reserves for re-growth, thereby weakening the roots and the plant. As seed production declines, fewer seeds are released to the environment. In time, weeds will be less able to compete with the desirable plant species.

Grazing can be part of an integrated control plan with chemical or other biological controls. Grazing can be used to remove old growth on noxious weeds, with the herbicide applied to the re-growth. This increases the effectiveness of the herbicide. In certain situations, noxious weeds may be grazed to suppress growth to the point where biological control with insects becomes efficient. For example, in control efforts with leafy spurge, grazing is utilized to remove the old growth of the plant and control seed set, then insects weaken the plant by eating the core of the stems and roots.

To determine if grazing with goats will be beneficial in a specific situation, the following considerations need to be carefully analyzed: 1) target weed(s) to be controlled, 2) desirable vegetation to be maintained, 3) environment and topography of the area, and 4) management for the goats.

Target Weeds

Identification Proper identification of the target weed (or weeds) is necessary for success. *Weeds of the West* is an excellent reference for identification and biology of weeds. Contact your local Extension office or local weed supervisor for further help with identification.

The life cycle of the weed, the seed type, and how it spreads must also be understood. Weeds can be classified as **annuals**, which are plants that complete their life cycle in a single growing season; **winter annuals**, which germinate in the fall and mature the following spring, **biennials**, which take two seasons to complete their life cycle; **perennials**, which live much longer than two years, or **short-lived perennials**, which live more than two years. Understanding the weed's life cycle helps to determine the timing of grazing. Noxious weeds will need to be grazed before the plants bloom and produce seed.

Seed type Some seed types can actually be spread by the goats themselves. Figure 1 shows the Velcro-like



Figure 1. Houndstongue seed has Velcro-like hooks that can attach to animal hair.

Photo by: Richard Old www.xidservices.com

hooks on houndstongue seed that can attach to animal hair. Entire seed heads can also be transported in the goats' hair. Seeds can also be spread through fecal matter if the plants are grazed after seed set. Therefore, grazing needs to take place before seed set.

Some weeds and plants can be toxic to the animals that graze them, with the potential to cause serious or fatal health problems. Toxic plants must be identified so other means of weed control can be used. For some plants, grazing can be timed for the non-toxic stage. Your extension office or weed control department should have information on toxic plants in your area.

Some weeds are managed more successfully with grazing than others. Grazing has been effective in controlling spotted knapweed, leafy spurge, tall pepperweed, and yellow star thistle, among others. Goats will graze some weeds anytime. For other weeds, grazing needs to take place at a specific time in order for the plants to be palatable to the goats. For example, whitetop is only palatable to goats at the rosette stage and past seed set. While it is actively growing at bud to bloom stage, it is high in alkaloids, giving the plant an unpleasant taste.

Goats prefer most plants early in the spring when they are tender but this may not be the optimum time to use grazing as a weed management tool. Plants expend the most energy as they are blooming and preparing for seed set. Grazing should occur as the plant is setting bud and into the bloom stage but before seed set. Grazing at this point should stop the seed set for the year. If grazed too early, the plant still has sufficient time to regrow, bloom, and produce seeds. When weeds are grazed early, they should be allowed to regrow for a time and then be grazed again. Allowing time for re-growth prior to re-grazing helps insure that goats will graze the weeds and not select the desirable vegetation. Grazing a plant two or three times within a season will weaken it, causing depletion of its root reserves.

Desirable Vegetation

The ideal time to graze is when the weeds are most susceptible and the desirable vegetation is dormant or inactive. When both weeds and desirable vegetation are actively growing and palatable at the same time, growers will need to determine an acceptable level of impact on the desirable vegetation. They may need to use an alternative grazing period.

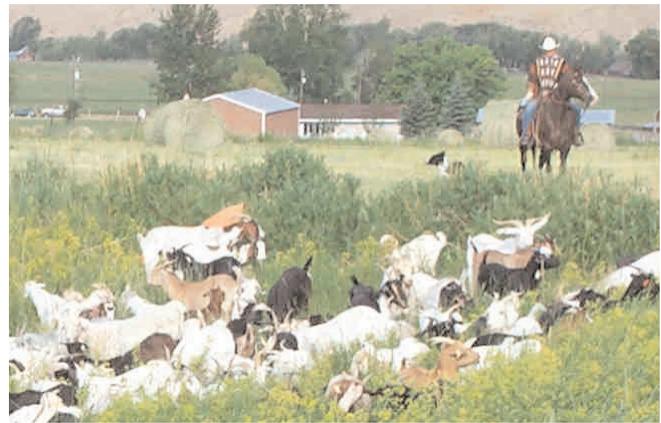


Figure 2. Herder on horseback checks on the impact of the goats on target weeds and desirable plants.

The number of goats used in an area will affect the impact of grazing on the desirable vegetation. If the weed infestation is light, just a few goats are recommended. The goats will then graze on the weeds and leave the desirable vegetation alone.

Environment and Topography

Environment and topography will influence the population of noxious weeds and desirable vegetation as well as the grazing management. For example, goats feel threatened in an environment of dense trees and dark cover, which will reduce their effectiveness. Weed control in riparian areas also provides a unique challenge because goats are not fond of crossing water or boggy areas.

Management Methods for Goats

Compared to other domestic herbivores, goats have unique dietary preferences. Cattle prefer grasses and sheep prefer forbs (non-grass like plants), but goats prefer twigs and tender plant shoots. A goat's diet will be influenced by the forage available, the age and health of the goat, the number of goats present, and the management method. Survival instincts prompt goats to consume what is available. If only grass is available, then that is what they will eat. If the available forage is hay or forbs, then they will eat hay or forbs. Goats have different nutritional requirements at different ages. Their stage of production, such as whether they are growing, pregnant, or nursing, will have an effect on dietary preferences. Dry does and wethers with low nutritional requirements eat mature plants. Growing kids and does with nursing kids seek younger forage with higher protein content, due to their increased nutritional requirements.

Determining which weeds the goats will eat can be controlled by the choice of management method. Herding, penning, tethering, and pasturing are commonly used management tools.

Herding Allowing goats to roam within a specific area while controlling their movements by herding lets them be more selective. Herding is generally used on large tracts of weed-infested land. The terrain and size of an area will determine the number of animals and herders needed. In rolling sagebrush terrain, herding from horseback is the most efficient method. In areas with taller growth, such as willows and trees, herding on foot may be required. A good herder is the key to effective weed management. Herders must keep the goats moving and carefully observe what they are consuming. When properly managed, herded goats will graze the weeds with little impact on desirable forages such as grass, sagebrush, and willows. Figure 2 shows a herder observing what the goats are consuming in order to know when to move them.

Penning In confinement situations, goats will graze their preferred weeds first, then eventually consume the less preferred plants. If left in a confinement area too long, goats will consume all the forage available, including grasses and forbs. As with herding, goats must be monitored and moved as needed to preserve desirable vegetation.

Several types of fencing materials are available for goats. Portable galvanized panels work well for this purpose. Goats can also be confined with electric strand fencing or electric netting. With either system, the goats should become accustomed to electric fences in a secure area. Electric fencing can be placed inside a secure area where the goats have an opportunity to safely test the fence. When utilizing



Figure 3. Four-strand electric wire will effectively confine goats.

electric strand fencing, strands should be from four to eight inches apart with every other strand hot. Figure 3 shows goats confined behind a 4-strand electric fence. Electric netting, another efficient method for confining goats, is shown in Figure 4. Electric netting is light and easily moved. After an initial investment in fencing and an adequate charger has been made, they may be used year after year.

Tethering Goats can also be staked or tethered to graze in weed-infested areas. A collar is placed on the goat, with an attached rope or chain secured to a stationary object such as a stake driven in the ground or a fencepost. Stakes must be heavy and long enough to prevent older, stronger goats from pulling them out of the ground. Avoid tethering goats near obstacles that can tangle the rope and restrict their movements. Goats will need a constant supply of water. Buckets and tubs need to be secured so the goat cannot tip them over.

Goats will consume what is available within reach of the rope. As with pen confinement, preference weeds will be eaten first. Goats must be monitored daily or hourly to observe what they are consuming. If left in one area too long, they will graze the forage down to bare dirt.

Pasturing Goats can be used for weed control in pastures. As browsers, they have a natural preference for plants other than grass. They will search out these plants for grazing first. For cattle producers, mature, rank forages are considered weeds, as cattle will not consume them. Cattle will selectively graze grasses, leaving other forages to become lower-quality, mature feed. As opposed to cattle, goats will evenly consume all of the pasture plants, leaving them in similar growth stages. This provides a pasture with plants of equal forage quality. In order to confine goats in a



Figure 4. Electric netting is another efficient method for goat confinement.

cattle pasture, cattle fences need to be reinforced with rolled net fence, electric netting, or several strands of electric fence.

Number of Goats The number of goats needed for a weed control program will be determined by the target weed, the size and density of the infestation, and the goat management method. An area with a leafy spurge infestation and a two-month window for grazing control needs fewer goats than an area equal in size with a spotted knapweed infestation, which has a three-week window for grazing control. Grazing studies on spotted knapweed in Lemhi County, Idaho, indicate that a single goat can consume one-third of an acre of spotted knapweed per day.

The infestation density influences what the goats will choose to graze. If the infestation is light, use fewer goats in order to take advantage of the goat's grazing preference for the noxious weed. In dense infestations or those with less palatable noxious weeds, using a larger number of goats will force them to graze the target weed.

Conclusion

As with other control measures, goat grazing must be applied properly to be efficient and effective. Using goats to control noxious weeds requires a long-term commitment. Due to extensive root systems and

long-lived seeds in the soil, many noxious weeds can recover quickly after the grazing pressure is removed. An effective noxious weed control program requires proper management of goats and goals consistent with this type of program.

Steps for Implementation

1. Identify and study the biology of the problem weeds.
2. Identify desirable plants and their response to grazing.
3. Determine the optimal time for grazing to meet weed control goals while minimizing the impact on desirable vegetation.
4. Decide on a goat management method: Herding, penning, tethering, or pasturing.
5. Determine the number of goats to be used.
6. Implement the grazing plan.
7. Monitor, adjust plan, monitor, adjust plan, monitor, adjust plan.
8. Watch patiently as weeds disappear and desirable vegetation thrives. Remember, this process may take several years.

Further Reading

Building an Electric Antipredator Fence, PNW 255, University of Idaho College of Agriculture Publishing, Order 783, \$2.50

Hoary Cress and Related Whitetops, PNW 359, University of Idaho College of Agriculture Publishing, Order 884, \$0.50

Idaho's Noxious Weeds, Bulletin 816, University of Idaho College of Agriculture Publishing, Order 1031, \$5.00

Identification of Knapweeds and Starthistles in the Pacific Northwest, PNW 432, University of Idaho College of Agriculture Publishing, Order 941, \$1.00

Leafy Spurge Biology and Management, CIS 877, University of Idaho College of Agriculture Publishing, Order 320, \$0.45

Biology and Management of Noxious Rangeland Weeds, Oregon State University Press

Multi-Species Grazing and Leafy Spurge, www.team.ars.usda.gov or phone 406-433-2020

Range Plants of Montana, Montana State University Extension, EB 122

Weeds of the West, University of Wyoming Publishing, \$18.00

Periodicals of Interest:

Goat Farmer thegoatfarmer@caprine.co.nz

Goat Rancher www.goatrancher.com

Meat Goat Monthly News 915-655-4434

Premier Fencing 800-282-6631

Ranch & Rural Living 915-655-4434

The Stockman Grass Farmer 800-748-9808 www.stockmangrassfarmer.com



Issued in furtherance of cooperative extension work in agriculture and home economics, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Charlotte V. Eberlein, Director of University of Idaho Extension, Moscow, Idaho 83844. The University of Idaho provides equal opportunity in education and employment on the basis of race, color, religion, national origin, gender, age, disability, or status as a Vietnam-era veteran, as required by state and federal laws.