

American Consortium for Small Ruminant Parasite Control

Best Management Practices for Internal Parasite Control in Small Ruminants

PASTURE MANAGEMENT

INTRODUCTION

Gastrointestinal parasites pose a serious health threat to small ruminants, especially those living in the humid environments of the Southern and Eastern United States. Because the nature of parasites is to steal nutrients from their host, infected small ruminants will have decreased growth, fiber, and milk production and lower feed efficiencies, if these internal worms are not effectively managed. Small ruminant producers may also experience decreased profitability due to increased treatment costs and animal mortalities.

Many gastrointestinal parasites that affect small ruminants have built up a resistance to all three classes of commercially available dewormers. Therefore, the goal of any small ruminant producer should be to reduce the exposure of their animals to gastrointestinal worms through proper pasture management. The objective of this fact sheet is to discuss several strategies that will help accomplish this goal as it relates to the principal stomach and intestinal worms of small ruminants, such as barber pole worm (*Haemonchus contortus*) bankrupt worm (*Trichostrongylus* spp.) and brown stomach worm (*Teladorsagia circumcincta*).

A producer must first understand the parasite life cycle to be able to effectively manage the parasites in pasture systems. Adult parasites live and breed in the abomasum and intestines of small ruminants, potentially producing thousands of eggs per day. As sheep and goats graze, eggs are shed in fecal pellets deposited on the pasture. Under ideal temperature and moisture conditions (warm and wet), the eggs hatch, larvae go through two molts, and develop into the infective L3 larval stage as quick as 3 to 4 days.

Dew or raindrops may assist these infective larvae in migrating several inches up the blades of grass. When animals graze near the bottom of the plant, they ingest the larvae and re-infect themselves. In-



Goats grazing ryegrass

Image by: Heather Glennon

fective L3 larvae are very active in hot climates and may only have a life span of one to three months in tropical areas, while larvae in subtropical and temperate areas may persist for six months or longer.

ROTATIONAL GRAZING

When implemented correctly, rotational grazing can decrease the exposure of livestock to parasites and provide high quality forage. If small ruminants are forced to graze the same pasture continuously, they will repeatedly return to desirable areas, potentially re-infecting themselves with parasites. Frequent and severe grazing pressure also weaken forage plants leading to lower forage yield and persistence that increase weeds.

Rotational grazing allows producers to control how short plants are grazed (stubble height), the length of time animals graze in a paddock, and the length of time in between grazing events. The majority of infective larvae will be found within the bottom three inches of the plant. Animals should be moved to the next paddock of fresh forage before they graze plants below this height and before they re-infect themselves with parasites.

Because it could take as few as 3 to 4 days for a parasite egg to develop into an infective L3, it is recommended that animals be moved to a new paddock within 1 to 3 days, before reinfection occurs. If not moved regularly between pastures/paddocks, animals will spend extended periods of time in the shade or near water sources where parasites thrive. Depending on the pasture configuration, moving animals every 1 to 3 days will discourage this behavior and decrease subsequent parasite loads.

Under ideal moisture and temperature conditions, most grasses are generally ready to re-graze within 14 to 28 days, depending on species and soil fertility. Unfortunately, the larval population on pasture may reach peak infectivity near that same time. A longer rest period between grazing events can lower the parasite load in a pasture as infective L3 larvae may use their stored energy and die while waiting for a suitable host to ingest them. However, one disadvantage to a longer rest period is that the overall forage quality decreases as the plant matures. If small ruminants are forced to graze the same pasture continuously, they will repeatedly return to desirable areas, potentially re-infecting themselves with parasites.

MANAGING GRAZING HEIGHT

Small ruminant producers can reduce the risk of parasite infections to their animals by properly managing the grazing heights of the forage plants. Common cool-season perennial grasses such as tall fescue, orchardgrass, Kentucky bluegrass and perennial ryegrass can be easily overgrazed, if the producer leaves their animals in the pasture for too long. For tall growing cool season grasses, such as tall fescue, and orchardgrass, it is recommended that animals begin grazing when they are 12 inches tall and end grazing when there is 4 to 8 inches of stubble height. For short growing grasses, such as Kentucky Bluegrass and perennial ryegrass, the recommendation is to start grazing at 6 to 10 inches of height and to graze no shorter than 3 to 4 inches of stubble height to reduce ingestion of infective larvae.



Pasture residue after grazing by sheep

Image by Dave Scott



Warm-season perennial grasses such as eastern gamagrass, big bluestem and indiangrass can provide good quality forage during the summer months if they are grazed from a starting height of 16 to 22 inches down to an ending height of 6 to 12 inches. Grazing of warm-season annuals such as millet, sudangrass and sorghum-sudan hybrids should begin when the plants are 20 to 24 inches tall and end when they are 8 to 12 inches tall.

USE OF ANNUAL FORAGES

Incorporating annual forages into the pasture system can reduce the risk of parasite infection in multiple ways. Warm-season annuals such as pearl millet, sudangrass, and sorghum-sudan hybrids can meet the energy and protein requirements of many classes of small ruminants, if they are managed properly and grazed at the correct heights. Before planting annuals, a producer may disk the soil or spray herbicide on the existing vegetation. These practices will dry out the parasites' environment leading to their death. It may take 45 to 60 days of plant growth before the annuals are at the correct height to begin grazing. It is likely some larvae would die during this time period, even if the producer did not disk or spray the area before planting.

UTILIZING BROWSE

Allowing animals to browse on woodlot vegetation encourages them to eat higher in the canopy where there is less chance of picking up parasites. This also gives permanent pastures time to rest and provides an additional feed source while warm season annuals are growing. Silvopasture, the practice of integrating livestock, forage production, and forestry, can also provide high quality feed while keeping animals from continuously grazing close to the ground. Stands of black locust, honey locust, and mimosa have been successfully incorporated into silvopasture systems for small ruminants. Even though mimosa is not in the Federal Noxious Weed list published by the US Department of Agriculture, it is considered invasive in several states. Contact your local county extension office for more information about plants suitable for silvopasture systems in your area.



Before and after

Image by Heather Glennon

FORAGES RICH IN TANNINS

Numerous research studies have shown that forages containing condensed tannins can have anti-parasitic effects. Sericea lespedeza, birdsfoot trefoil, chicory, sainfoin, certain browse species, pine bark, black locust trees, and tropical legumes could be incorporated into the diets of small ruminants to decrease parasite burdens. Sericea lespedeza has been extensively researched. More information on this topic can be found at https://www.wormx.info/sl.

MULTISPECIES GRAZING

In general, cattle and horses do not share the same gastrointestinal parasites as sheep and goats, therefore grazing them in the same pastures as small ruminants could help manage internal parasites. When cattle or horses ingest the infective L3 larvae that infect small ruminants, the parasites die because they cannot complete their life cycle in the foreign



Goats grazing sunn hemp

host. These other livestock species help "clean" the pastures before the small ruminants re-graze the area. The popular leader-follower system allows the sheep or goats to graze the taller, higher quality vegetation first. Cattle or horses then follow and graze the remaining vegetation closer to the ground. Mixed species grazing can also lead to better utilization of vegetation in a pasture due to the animals' differences in grazing preference.

HARVESTING HAY

Harvesting hay is another way to increase the time between grazing events on a pasture. Producers who rotationally graze their pastures may have extra forage due to the increased forage utilization. By making hay on this land rather than grazing animals, producers can increase the length of time the land is without animals. Hay mowers usually cut the forage shorter than grazing animals. This allows sunlight and heat to penetrate to the soil surface causing larvae to dry out and die. Additionally, the process of drying involved in hay making kills infective larvae on the forage so that, if well preserved, hay may safely be fed to small ruminants.

Image by Heather Glennon

INCREASING FORAGE QUALITY

Livestock fed a diet that meets or exceeds their nutritional needs, especially the protein requirement, have better resilience against parasite infections. Including legumes in pasture systems will increase the protein content of the diet. Common cool-season legumes include white clover, red clover, crimson clover, crown vetch, hairy vetch, and birdsfoot trefoil. These could be interseeded into perennial or annual grass pastures. Legumes that could be grazed during the summer months include alfalfa, sunn hemp (not allowed in some US states – consult state guidelines for regulations), cowpeas, forage soybeans and sericea lespedeza.

Forages in the leafy, vegetative state are higher in crude protein than those in the stemmy (with seedhead), reproductive state. Rotationally grazing helps keep the pastures from getting too mature or stemmy. Applying the recommended amounts of lime and fertilizer to pastures will encourage high yield and, with proper grazing management, high quality of desirable forage species. Cool-season forages are generally regarded as being higher quality than warm -season forages.

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BEST MANAGEMENT PRACTICES FOR PASTURE

- Rotational grazing
- Follow recommended grazing heights
- Using annual forages
- Including browse
- Incorporating tannin rich forages
- Grazing multispecies of animals
- Harvesting hay
- Increasing diet quality



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