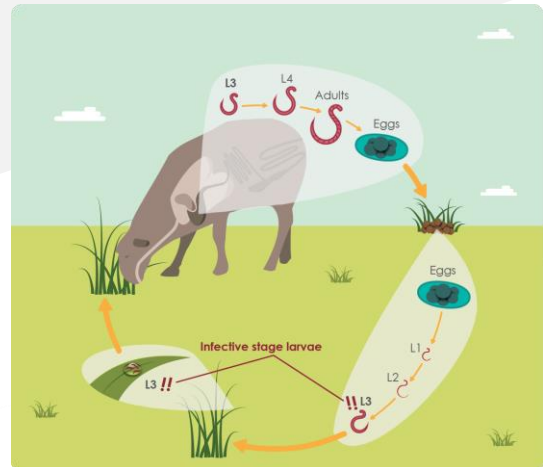


Optimal pasture management for the control of parasites

The present document describes one of the components of integrated management of parasitism – optimal pasture management.

Pasture quality

It's important that animals have access to pastures rich in energy and proteins, especially during periods of increased nutritional requirement (e.g. pastured lactating ewes, growing lambs). In fact, a rich and diverse diet contributes to proper immune function, allowing animals to better control parasite infestations. Ideally, varied forages should be offered in order to stimulate consumption and take advantage of the nutritional and medicinal properties of different plant species (e.g. chicory). Additionally, adequate management of grazing surfaces (seeding, pasture, mowing, fertilization, renovation) maintains the quality and diversity of grazing plants and helps animals live comfortably alongside parasites.



The ultimate goal of proper pasture management is optimization of the nutritive value and productivity of grazing surfaces, all the while reducing exposure to parasite larvae.

BETTER FED ANIMALS, BETTER CONTROL OF PARASITES

Bioactive forages¹: certain plants rich in condensed tannins and/or sesquiterpenes improve an animal's capacity to fight gastrointestinal strongyloses and maintain adequate productivity despite the presence of parasites. Among these plants, chicory and trefoil are two that can be cultivated in Quebec. As well as their high tannin/sesquiterpene and protein content, these species are appetizing for sheep. However, given that they are short-lived (particularly chicory, a biennial that rarely lasts more than 4 years after seeding), it's important to have an adequate reseeding strategy to ensure that these plants persist on parcels.

¹ [MAPAQ](#)

Chicory



Trefoil

Planning the use of grazing surfaces

The use of grazing surfaces should be planned at the beginning of the season based on the:

- number of animals and their needs;
- duration of the grazing season;
- available grazing surfaces;
- botanical composition of pastures (nutritive value, agronomic considerations, productivity);
- grazing system;
- parcels to be harvested for hay and their renovation.

This planning determines which paddocks will be used and in which order, as well as allowing farmers to establish the number and category of animals to stock in each paddock.

During the grazing season, adjustments to this plan may be necessary in order to adapt to grass growth, among others. This method allows farmers to properly feed their animals, all the while maintaining the productivity and health of their fields.

Animal density

Evidently, a decrease in animal density or load decreases the number of parasite eggs deposited on the ground. On the other hand, the number of eggs developing into infective larvae (L3) increases when animal density on the parcel is high. This is a concern that must be addressed in an intensive grazing system.

Different formulas exist to estimate the carrying capacity of a paddock. These calculations are especially useful to allow the farmer to develop his/her eye; his/her sense of observation in order to evaluate the ratio of animal



density/available forage at entry/residual forage at exit. That said, the farmer's experience and/or the support of an advisor are essential to the development of a plan adapted to the reality of each individual enterprise.

Grass height

Observing the height of grass is important to properly manage livestock entry and exit from paddocks. While most parasite larvae are found at the base of plants, in dry periods, some can migrate to a height of up to 20 cm. Therefore, in order to limit ingestion of larvae while still encouraging plant regrowth, animals should be rotated between paddocks before the grass is too short (ideally around 10 cm). As such, animals have access to abundant forages and are less inclined to graze close to the ground.

Secure pastures for at-risk animals

Weaned lambs and ewe lambs are more susceptible to parasitism than adults, and should be prioritized for placement in secure paddocks (low contamination).

A secure pasture – (low level of infestation) – is defined as follows:

- Surface grazed by animals other than sheep or goats during the last year, or
- Surface tilled since the last sheep were present, or
- Surface mowed/harvested at the beginning of the season and grazed for the first time since, or
- Surface left to rest (not grazed) for at least 3 months (in hot temperatures), or 6 months (cold temperatures).

Water systems and rest zones

In a grazing system, access to water must be well planned. Whether mobile or permanent, water troughs must offer constant access to potable water without animals having to travel long distances. **CAUTION:** fixed troughs can create damp zones where fecal matter accumulates; these zones become a potential source of parasites and other diseases. To avoid this effect, troughs should be laid out in such a way that the zone remains dry.

Rest areas in a paddock are also important features, especially to allow pastured animals access to shade. **CAUTION:** when sheltered areas are small, or when few are offered for a large amount of animals, manure may accumulate and create damp zones.

Grazing systems

Rotational grazing is a key element for prevention of internal parasites. Returning animals to the same parcel of land at certain moments during the season increases the risk of parasite infestation. Various approaches can help reduce this risk, all the while maintaining quality pastures.

The chosen system must match the reality of each individual enterprise. Whether rotational or continuous, there exist a wide range of grazing systems, from **intensive** to **extensive**. No matter the intensity of the system, the organization of pasture space must be planned carefully and must include predetermined paddocks with gates and livestock corridors. Infrastructure is therefore necessary: permanent and/or mobile fences, consistent access to water troughs (permanent or mobile), shady areas, etc.

Strip grazing

The most intense grazing system consists of a daily allocation of fresh grass as a result of the shifting of portable fences; some opt to change strips every 2-3 days. This strip, or rationed grazing system requires moveable, high-tensile fencing. This type of system:

- supports a higher density of animals and, when well-managed, produces high-quality grass while limiting forages wasted due to trampling;
- allows frequent observation of animals, and thus early detection of suspect animals or animals with clinical signs;
- allows animals to be moved before eggs deposited on the strip with feces have time to transform into infective L3 larvae; considering that hot, humid conditions accelerate the development process of eggs into L3, a maximal duration of 4-5 days per strip is recommended to avoid ingestion of L3.

Animal movement is also influenced by the quantity of available forages, the size of parcels, and estimated seasonal growth.

In such an intensive system, returning to the same strip during the season may be inevitable in order to use forages at their moment of optimal growth and nutritive value. Such an intensive technique means the farmer must be extra vigilant with respect to parasite screening; the use of each strip should be documented in a pasture registry.

A note on twice-over grazing: In optimal conditions (heat and humidity), parcels are often ready to be regrazed 21 to 28 days after a pass, which corresponds, on average, to the period of peak infectivity of larvae. A longer interval between passes on the same strip decreases risk of infestation by L3 larvae, but means that use of the forage resource is less optimal. The following are certain approaches that can help delay the return of animals to the strip, thus decreasing the risk of parasitism, all the while encouraging high-quality grass on the strip:

- harvest a cut of hay;
- renovate the strip and plant a catch crop;
- pass less sensitive animals (dry ewes, for example);
- alternate with a different animal species (other than goats).

Rotational grazing (simple or multiple)

These systems are less intensive than strip grazing: parcels are larger, and animals spend more time on each parcel. With simple rotational grazing, animals change paddock after 10-20 days of grazing and never return to the same paddock during the season. Grazing alternates with cutting to ensure proper management and optimal use of the forage resource. Rotational grazing with multiple passes (two, or even three) is similar to simple rotational grazing, but animals can return to the same paddocks during the season. It's the system most frequently used in Quebec.

Rotational grazing is a system that:

- requires less labour than strip grazing, but requires numerous available grazing surfaces;
- reduces exposure to parasites, but grass management is slightly less optimal (more picking and choosing by animals, more losses).

Continuous grazing

A continuous grazing system refers to one or a few very large parcels on which animals graze for several months, if not the entire season.

This type of system:

- is less costly and requires less management;
- increases the risk of causing serious parasite infestations;
- does not allow optimal utilization of the forage resource because the most nutritious or appetizing plants quickly disappear with repeated grazing.

In conclusion, there exist numerous grazing systems, each with its advantages and disadvantages. The choice of a system is dependent on the goals of the farmer. Here we describe an intensive first system for grass-fattening of lambs.

Case study: Intensive strip grazing system for grass-fattening of lambs in Montérégie

A herd of 70 ewes is kept on approximately 16 hectares dedicated to production of forages. Of these 16 hectares, 4 are never grazed and provide 2 to 3 hay harvests (depending on the season). On all the areas dedicated to grazing (12 hectares), a mixture of forages including white clover, smooth brome, Type B Mixture, ryegrass, and chicory is used (Table 1). Chicory is present for the first two seasons, but has practically disappeared by the 4th pasture season. Frequent reseeding of parcels (every 5-6 years) ensures the nutritive quality of grass and higher pasture

and animal productivity. Frost seeding can be performed after the 3rd or 4th season in order to make certain that clover persists in the mixture.

Mixture of forage species used in pastures

Species	%	Kg/ha
White clover	10	2
Smooth brome	35	6
Type B mixture	25	5
Ryegrass	25	5
Chicory	5	1
	100	18

The herd lambs once yearly, between April 20th and May 7th. Ewes and their lambs go out to pasture the second week of May. At the beginning of the season, between 65 and 70 lactating ewes accompanied by their 150 lambs graze on an area of approximately 4 hectares. The first pass is quick; the 4 hectares are grazed in 16-18 days. Each day, the herd has access to a strip of grass approximately 2 000 to 2 500 m². Abundant grass growth in May and June can support the increased nutritional requirements of the ewes as well as their lambs, who will progressively consume more and more grass. Two more rotations of approximately 18-20 days each will then follow on the same surface. If necessary, a cut can be performed between the 2nd and 3rd pass. At the end of the 3rd rotation, it's the beginning of July – time to wean lambs.

Freshly weaned lambs are moved onto new parcels on an area of the farm where ewes have never grazed. Approximately 4 hectares grazed between July and October are thus dedicated to the fattening of 150 lambs. A first cut of hay is performed mid-June before the arrival of lambs, as the regrowth is of optimal quality to introduce to young lambs in their growing period.

At weaning time, mothers are kept in pens and fed with first cut dry hay for a week to encourage drying-off. Next, they are given access to a new paddock of approximately 2 to 3 hectares that has been preliminarily mowed and harvested in mid-June. In this paddock, a new strip of grass, the dimensions of which are adjusted to the needs of the ewes (around 1 200 to 1 500 m²), is offered each day. The growth of grass is less rapid in July and August; as such, rotations last 25 to 30 days depending on the season. A large portion of the 4 hectares intensively grazed between May and June will be pulled from pasture rotation for 2 months, allowing for a cut of hay towards the end of August.

Each year, approximately 2 of the 12 hectares are renovated. Left fallow at the beginning of July, the paddock is seeded mid-August with oat-wheat-pea fertilizer; it is then added to the grazing surfaces available for ewes or lambs at the end of the season. This cover crop allows for at least two passes, one at the end of September and another at the end of October, as well as providing green manure (rejects and roots). The following spring, the parcel will be re-seeded with forage mixture for grazing.

Parasite management in intensive grazing systems

Such an intensive strip grazing system leads to a high parasite pressure that should not be taken lightly. Hot periods in Southern Quebec at the end of June can be sufficient to prompt rapid development of eggs into larvae at a moment when ewes and lambs are more vulnerable. To combat this phenomenon, farmers observe the herd daily and regularly monitor fecal egg counts using feces collected from the pasture (analyzed in pools at the laboratory).

On the other hand, such an intensive strip grazing system has characteristics that better equip the herd to live with a certain level of parasitism. These include:

- Prairies composed of diverse flora, both from a nutritive and productive point of view, which can satisfy the increased nutritional requirements of lactating ewes and fattening lambs;
- Young lambs quickly learning to consume forages;
- Weaned lambs grazing on minimally contaminated pastures;
- Introduction of a cut in the rotational system, allowing better exposure to sun and dry conditions in summertime, as well as a 2-month rest that contributes to a decreased number of infective larvae on the pasture.