The Deadly Barber Pole Worm

—Ulf Kintzel

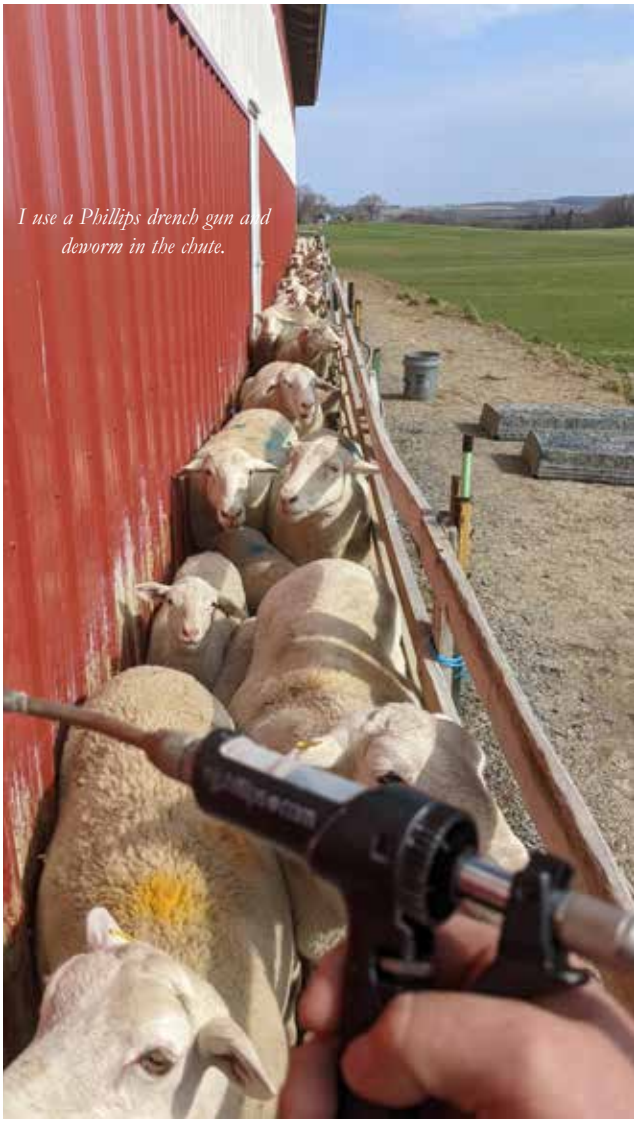
More than ten years ago, I wrote an article about the management of the barber pole or barber's pole worm in sheep. It is long overdue to comprehensively update the information with this new article. Why? Because many of the readers of this magazine are new. Raising sheep on a small scale is on the rise. Also, I learned a few new and important nuanced facts in recent years after more than 40 years in the sheep business.

The barber pole worm *(Haemonchus contortus)* is potentially a problem for everyone who is raising their sheep on pasture. It is potentially deadly and it is common. Some other parasites can be deadly too, but none is as deadly as the barber pole worm. In fact, I rank this worm as one of the two most common causes for people losing sheep; the other most common cause for losses being overeating disease.

Sheep and lambs with a barber pole infestation appear weak, slow, and "sad." When doing a pasture shift, sheep with a heavy infestation often come at the end of the flock and, while all the other sheep might graze vigorously, seem listless, graze perhaps some, and will likely lie down when all other sheep still graze. Some may develop a "bottle jaw," which is a soft swelling under the lower jaw. However, not all do, and those that develop it often develop it late during the infestation when they are already close to death. The barber pole worm does not cause diarrhea. That is an important detail because many flock owners assume it causes diarrhea; after all, many other common nematodes (roundworms) cause exactly that.

If you look up the life cycle of the barber pole worm in a book or on the internet, you will see a circle that shows you how the sheep ingest stage 3 larvae (L3) on pasture. The L3 larvae move up the blades of grass and stems of forage when the pasture is moist, most notably when you have dew. The sheep will consume them when grazing.

After being ingested, the L3 larvae move to the sheep's fourth stomach, the "true" stomach (abomasum) and develop into the stage 4 larvae (L4). Then the L4 larvae develop into male and female adult worms.



I use a Phillips drench gun and deworm in the chute.

Photos by Author

They stay in the fourth stomach, sucking blood by the thousands. That leads to anemia, which is a lack of red blood cells. Blood cells carry oxygen through the body to organs. Without adequate amounts of oxygen, these organs may fail and the sheep may die.

The adult worms mate in the abomasum and shed thousands and thousands of eggs, which enter the pasture in the sheep droppings, infecting the pasture. When the soil is warm and moist, the eggs develop into stage 1 (L1), then stage 2 (L2), and then stage 3 (L3). The L3 larvae are

then being consumed by the sheep when they graze. That closes the cycle. Under favorable conditions during moist and warm weather, this cycle takes about three weeks.

Because of this three-week life cycle, it was conventional wisdom many years ago that a pasture rotation cycle of at least three weeks would break the life cycle of the barber pole worm. That would mean that each pasture cell would get at least three weeks rest and would not be grazed during that time. In fact, that is what I learned during my apprenticeship in the mid-1980s and what I practiced it until the early 2000s. Unfortunately, that three-week life cycle only occurs when the conditions are favorable for the worm. If they are not, and if it is cooler and/or drier, eggs may not hatch and the larvae can slow their development until conditions are favorable again. It is called environmental inhibition.

For how long can the development be slowed? Various field trials showed that it can take many months before the larvae resume development; one field trial I read showed a timeframe of six months. Regardless of whether it is two or three or more months that the development is slowed, ridding your pasture of barber pole worm larvae by giving each pasture cell a rest that lasts months is not a meaningful approach in wanting to control this worm.

Of course, a pasture rest of several weeks is good for various other reasons to establish strong plants and get higher yields; however, pasture rest in a climate like mine in western New York should not go much beyond 50 days in established pasture. I am aware that many graziers still lecture the long-held belief of breaking the worm cycle with pasture rest. However, that approach should be discarded.

The development of the L3 larvae inside a sheep can also be delayed. That is what I learned somewhat recently. A little over a year ago I received a call from a sheep farmer who uses my White Dorper rams to upgrade his Katahdin flock. He had again lost a number of ewes in the winter that were kept in the barn, fed haylage, and raised lambs. His vet suggested it was the barber pole worm that killed them. I was skeptical. Without any grazing, where could they have possibly infected themselves? The larvae would only be on pasture, but the ewes were not on any pasture.

I reached out to my veterinarian friend in Germany, now residing in Canada, a specialist in contagious diseases in small ruminants like sheep and goats. He too thought that the barber pole worm was the cause of death. I followed up with his assessment by doing some more reading myself. Here is what I learned: In the fall, when sheep consume pasture infected with the barber pole stage L3 larvae, the larvae will not necessarily complete their life cycle inside the sheep. They may remain inside the ewes until conditions are more favorable. This is called "arrested development" (hypobiosis).

The further development may be triggered months later by a weakened immune system of the ewes, typically during lambing and when ewes nurse young lambs. This is why you can get severe barber pole infections in sheep in late winter or early spring even though they haven't spent any time on pasture for several months.

What can you do to eliminate or control infections with the barber pole worm to avoid losses of sheep? Let me start by saying you cannot eradicate it. You will have to manage it. Getting rid of it is as likely as always having clean boots when working on the farm; it is not going to happen. Secondly, there is no silver bullet solution. There is no magical potion you can use. You must apply a multi-pronged strategy. Let's discuss the many "prongs."

Various sheep breeds have different levels of resistance to the barber pole worm. For instance, Caribbean sheep breeds like the Saint Croix sheep are highly resistant. Unfortunately, most sheep breeds that produce any meaningful amount of meaty carcasses do not come with a natural resistance. However, you can select for it by simply culling those adult sheep that continue showing signs of the barber pole worm while most of your flock does not. Be careful that you don't cull yourself out of business, since there will be other reasons you will need to cull sheep for also. In other words, start with the sheep that are the most affected; just don't cull half your flock at once.

I am aware that more extreme and uncompromising culling strategies are recommended by some. The catch is, the ones recommending it usually don't make a living raising sheep. If you raise sheep for a living and you follow such radical advice, you will soon have culled yourself out of the sheep business.

You want to be aware that lambs and young sheep must still build resistance when the barber pole worm challenges their immune system. You also want to be aware that the immune system weakens when a ewe nurses lambs. The barber pole worm may infect a ewe on which it had no chance when the ewe was without lambs. Take those two facts into consideration when applying

Throughout the grazing season I practice a daily pasture shift.

your culling strategy.

Over time, through targeted culling, you will increase the level of resistance to the barber pole worm within your flock. This approach will go a long way; however, it alone will not do it.

Your grazing management affects the management of this parasite as well. If you still practice set-stock grazing, I will have to disappoint you. I have no advice for you. Rotational grazing is a necessity for economic and pasture productivity reasons as well as the control of the barber pole worm. A daily rotation is preferable. A two-to-three-day rotation is acceptable. Anything beyond that becomes problematic, since the life cycle from eggs in the pasture to infective L3 larvae may only take 5 to 7 days in warm and moist conditions.

As an aside, grazing a pasture cell down, needing a week or two doing so, and then moving to the next grazing cell is not rotational grazing at all, even though you rotated the flock into a new pasture. It still is set-stock grazing. Any grazing system that goes beyond a week of grazing a pasture cell, thus grazing regrowth, is considered set-stock grazing.

Leaving residual in a grazing cell of about four inches is recommended. Since most of the larvae stay at or below four inches and don't crawl higher on a blade of grass, the intake when grazing is reduced. That matters. Fewer worms mean a sheep's immune system is challenged but not necessarily overwhelmed. That is one good reason for leaving residual of about four inches after grazing a pasture cell. The other main reason for that length of residual is rapid regrowth of the pasture through photosynthesis.

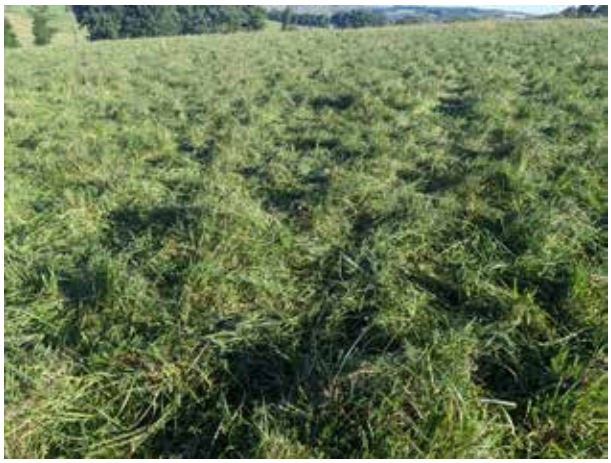
Then there is treatment. If you use chemical dewormers, stay clear of ivermectin. One brand name for it is Ivomec, but there are generic versions with the active ingredient ivermectin. It is highly unlikely to be effective because of the worm's resistance to it after decades of overuse. The same will likely hold true for any white dewormer like SafeGuard or Valbazen. The two dewormers that may still be effective are moxidectin, brand name Cydectin, or levamisole, brand names Prohibit and LevaMed. Both come as an oral drench suitable for sheep. Please take into consideration that levamisole may kill adult worms but is likely not as effective against ingested larvae.

If testing your flock's level of resistance to individual dewormers before treatment is an option for you, go for it. I suspect that the great majority of my readers cannot access such service. Likewise, before treatment one should collect stool samples and have an egg count done before deworming. To be thorough, I ought to mention this, although I am aware that this too is a service many

cannot access in any reasonable or timely fashion.

However, there is a quite reliable way of checking if your sheep are suffering from a barber pole infestation. It is done by checking the color of the mucous membranes of the lower eyelid. This is often described as "checking the eyelid color." A sheep suffering from barber pole infestation, and thus being anemic, will have a pale or only slightly pink eyelid color. A sheep that is not affected will have deep pink, even red, eyelid color. There are color charts available on the internet. Research the FAMACHA test, and you will find a chart and a description. It is a wonderful tool that can easily be implemented, even by those who lack experience.

If you belong to a church of the plain people and do not have access to the internet, just remember this: white, pale, and only slightly pink eyelids indicate a barber pole infestation; deep pink or red eyelid color means there is no treatment warranted. In cases that are borderline, I also take the overall behavior and body condition of the animal into consideration.



This picture shows the residual I leave after a cell has been grazed.

When you deworm, remember that resistance will inevitably build over time. So don't deworm in regular intervals. If you deworm the whole flock, know exactly why. Consider deworming individually affected sheep instead of the whole flock. When deworming, formulate the dose according to the heaviest sheep in that age group. Don't underdose; that too can increase the likelihood of resistance to the dewormer. For instance, when you deworm ewes ranging in weight from 170 to 200 pounds, deworm all for 200 pounds. Likewise, if the weight of your lambs ranges from 35 to 50 pounds, deworm all lambs for 50 pounds.

Be careful not to overdose too much. Levamisole can be life-threatening if overdosed since it is a nerve poison. More is not better anyway. More will not make it more effective. Cydectin has a much broader safety margin and overdosing is not a high risk.

What if you don't want to use chemical dewormers or can't because you are organic? I mentioned in a previous article this year that I am using copper sulfate as a dewormer from time to time. Just don't use it indiscriminately. Educate yourself before you do. Copper toxicity, while often exaggerated, is still a real thing. As a preventative measure, you can also use copper boluses designed for goats. The particles in these boluses are made of copper oxide, a much safer version of copper compared to copper sulfate since it is poorly absorbed.

Another strategy to combat the barber pole worm could be the use of tannins. They reduce the reproduction of the barber pole worm, meaning the worms lay fewer eggs. A commonly known plant with tannins that can reduce the egg count of the barber pole worm is birdsfoot trefoil. The most effective plant I have heard of is Sericea lespedeza. However, I have no personal experience with it. If that is a route you wish to try, please seek someone out who has experience with it.

Are you also raising cattle besides sheep? Then you may be in luck. Cattle are dead-end hosts for the barber pole worm. So, if you graze your sheep first in a pasture and then your cattle several weeks later, you will "clean up" your pasture with no ill effect to your cattle. Then you can graze the pasture again with sheep during the next cycle.

That concludes my list of management tools. If you are wondering why some treatment options are absent, that is not an oversight. I am aware of other practices, but since I found no evidence anywhere of their effectiveness, I am leaving them out.

If you happen to read one of the decades-old articles I wrote about deworming and the barber pole worm and you find there some statements that are seemingly contradictory, go with what I wrote here. I have learned more about this deadly parasite over the years. With that in mind, and since some of my followers love my German sayings, here is one that addresses the fact that for me too learning never ends: "*Du kannst alt werden wie eine Kuh, du lernst immer noch dazu.*" (You can get as old as a cow, yet you will still learn something new.)

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