



THE HEATHER TRUST

Promoting Integrated Moorland Management

Members' Briefing

Sheep Ticks

The principle threat posed by sheep ticks *Ixodes ricinus* is through their capacity to transmit diseases that affect humans, birds and animals. The principal cause for concern amongst humans is Lyme disease, which can be fatal or cause chronic disability. In animals, a range of diseases is transmitted by ticks, including redwater in cattle and tick borne fever, tick pyaemia and louping ill, all of which affect sheep. Louping ill is of particular interest as it involves a cycle affecting grouse and sheep, modified in some places by mountain hares, which can severely reduce the economic earning capacity of moorland.

Techniques have been developed to control tick numbers and diseases. If these are applied rigorously, they have been shown to be effective. Reducing tick numbers reduces transmission of diseases and the risk of exposure to humans, livestock, wild animals and birds. Vaccination of cattle and sheep against specific diseases is recommended when disease prevalence is high.

In Brief

It is likely that the use of sheep treated with acaricides and the control of wild host animal populations is necessary to reduce high populations of ticks. Whether transmitting diseases or not, a tick burden can place a cap on the productivity of the red grouse population. It is to the advantage of all moorland interests, sporting, farming and recreation, that tick populations be monitored and controlled.

Tick control and louping ill reduction are related activities, dependent upon the prevalence of the disease in an area. If levels of louping ill are high, there is justification for controlling the disease directly by the vaccination of sheep.

It is crucial that a tick management plan is not undertaken in isolation. Cooperation between neighbouring landowners and tenants is crucial to the success of any attempt to control tick numbers.

Tick Habitat

Habitat management may play a role in tick control. Though there is little concrete evidence of a control effect by managing habitat, actions which might limit tick numbers generally represent good practice for moorland biodiversity. Ticks need moisture to survive, and they thrive in conditions where there is a deep, moist (but not saturated) litter layer made up of dead and fallen vegetation.

Rank grasses, bracken and stands of old heather provide this litter layer in abundance and if management can reduce the depth of vegetation (and the litter layers in particular), this will help to reduce the survival rate of the ticks.

Ticks also require structural vegetation on which to climb and find hosts. Well-balanced grazing management can achieve the necessary degree of habitat control on grass-dominated areas to prevent tall vegetation.

Burning is effective for dwarf shrub heaths such as heather, and bracken control may be necessary to reduce the dominance of this plant and to allow the litter beds to be broken up.

Tick Control

Domestic stock can be used to kill ticks directly. If sheep are correctly dosed with a pour-on acaricide, the great proportion of ticks biting the sheep will be killed. This practice uses sheep as “tick mops”, and has been shown by Game and Wildlife Conservation Trust (GWCT) research to be an effective means of tick control.

The main acaricides are Dysect or Crovect, but Coopers Spot-On is sometimes recommended for lambs. Be aware that veterinary advice and an assessment of personal protection needs should be taken before any treatment programme is commenced.

There has been some debate about treating wild animals for ticks, but legislation does not allow this. Moorland mammals such as deer, goats and hares will all carry *I. ricinus* ticks to some extent, but there is no provision for treating these animals other than through research licences. The primary concern is that treated animals might enter the human food chain.

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Tick Mops

The Heather Trust has long supported the benefits of sheep as part of an effective management regime, and the “tick mop” function is a further benefit that they can offer.

The drawback with the “tick mop” approach is the cost. The protection provided by the pour-on acaricide does not last long, and its duration will vary depending on the quality of the application of product, the level of tick challenge and the environmental conditions in the area. At most, the protection is likely to last eight weeks and if application has been less than perfect, it could be much shorter than this.

When the protection has expired, it is necessary to gather the stock and re-treat them. The cost of the additional gathers is a further expense in addition to the cost of the acaricide. However, there are no short cuts, and leaving the stock without protection provides an opportunity for the ticks to obtain blood meals and reproduce, thus defeating the object of the exercise.

Monitoring Tick Numbers

The progress of the “tick mop” protection can be monitored by examining the sheep. If they are carrying large numbers of ticks, clearly they are out of protection and need to be treated as a matter of urgency. When all is working well, very few ticks will be seen on each sheep, and it may be necessary to examine several sheep before finding a single tick.

It is also possible to inspect deer or hares and to use these as a monitor for tick numbers. To establish trends, a consistent form of monitoring is required. Arguably, where sheep are present it is better to use them for this purpose, since the subject does not need to be killed before inspection. One part of the sheep should be chosen as the area from which to assess tick burdens. This is often the bare skin areas at the tops of the legs.

Typically, the distribution of sheep ticks will not be even and some parts of a moor will have higher densities than others. Monitoring can reveal where the high densities are and it might be possible to focus the tick mop work on sheep hefts that carry the greatest tick numbers.

It should be realised that if the tick population is large, they can have a significant impact on young bird populations even without any disease. GWCT research has indicated that if there are 18 ticks on a bird chick, their presence alone is enough to decrease the survival rates of chicks.

Ticks do not respect man-made boundaries. Many wild animals can carry ticks, and red deer have been known to carry over 5,000. The number of these that are viraemic will vary with a wide range of factors including the host species. Even red deer which do not allow louping ill virus to replicate can spread previously infected ticks.

Unless neighbours are also involved in a tick control programme, there is a risk that viraemic ticks will be imported into the tick vacuum induced by tick control work on adjoining land.

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Louping ill

Tick control measures and the treatment of louping ill often get lumped together in people's minds. They can be related, but a clear understanding that ticks are the transmission path for the disease of louping ill (as mosquitoes are for malaria) helps in designing control programmes.

Work by Moredun Research Institute (MRI) established that louping ill is a viral disease that primarily affects grouse and sheep. Exposure to the virus is established by testing grouse and sheep blood for antibodies. In sheep, the disease symptoms are a loss of muscle control leading to shaking and ultimately to death. In grouse, the disease causes a loss of condition and death. Being bitten by or eating a tick that is infected with louping ill can kill up to 80% of grouse chicks.

Although other species may carry ticks which are infected with louping ill, only grouse and sheep show amplified symptoms as they appear to be the only species which allow the virus to replicate inside their bodies.

MRI and GWCT research indicates that the type of treatment recommended depends on the proportion of the blood samples that test positive for louping ill. If less than 10% of tests are positive, it is likely that the disease can be controlled through the use of acaricides (pour-on or dips) only.

Above 10% but less than 25%, it is likely that vaccination of young stock to boost immunity to louping ill would be recommended.

At higher levels, it may be necessary to double vaccinate the stock to give a higher level of protection. At about £4.00 per injection for the vaccine alone, this adds to costs considerably.

Conclusion

- Managing ticks where they are common and carry diseases can be shown to have sporting, farming and public health benefits.
- Managing ticks is an expensive process, and at present there is no public funding available to help with these costs.
- It is necessary to run the treatment programme for long enough to make a difference. It often takes at least five years to achieve the desired results, and it could take longer.
- It is important to have the commitment of everybody involved in the programme from the start. Gaps in treatment mean any benefits can be quickly lost.
- When there has been the required attention to detail, a programme of tick reduction and louping ill control has been shown to be successful in different parts of the UK. However, a half-hearted attempt can be complete waste of time and money. If there is uncertainty about the continuity of funding or the commitment to the work, it would be better not to start and invest the money on a horse!

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This is one of a series of briefings that have been produced by the Heather Trust to provide an overview on a range of topics that are relevant to people with an interest in the management of moorland or through visiting these areas.

These briefings are not intended to be definitive but aim to provide some useful background. We are only too aware that every bit of moorland is different and the Trust will be pleased to provide more detailed advice about how this guidance could be relevant to a particular area of moorland. Please see the contact details above.

All the briefings are available to download from the Trust's website free of charge. However, if you find the content useful and you are not already a member of the Trust, you might like to consider supporting our work by joining. Details of how to do this can be found on the "[membership page](#)" of our website:

We acknowledge the role played by the Moredun Research Institute and the Game and Wildlife Conservation Trust in conducting much of the contemporary research into tick, disease and control strategies.

Available for download from the HT website