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Control of the sheep ked

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Highlights

The sheep ked is a wingless, blood-sucking fly that spends its entire life in the fleece of sheep. Unless they have been treated, animals that become infested in the summer have many keds by midwinter, after which they become resistant. The insects gradually die off and few are left by shearing time. In the meantime, the new crop of young lambs has become infested and remains so until the following winter.

In greasy wool, ked debris and excrement account for a 5–10% shrinkage, resulting in a lower classification of wool and a lower price per kilogram. Keds cause reduced weight gains of lambs and reduced wool growth in all sheep. Because range grass and hay deteriorate over the fall and winter, sheep need a supplement to bring protein intake to 10% of the diet, as well as 5000 IU of vitamin A daily to maintain vigor and decrease lambing problems and ked infestation.

Range animals should be treated once a year, and all newly purchased animals before they are allowed to run with the clean flock; the best time is 1–2 weeks after shearing. Treat every animal in the flock; otherwise the entire flock may become reinfested. Separate ewes from lambs. Power spraying is now the most popular method of treatment. Do not spray animals when daytime temperatures are below 5°C.

Life history and abundance

The sheep ked, *Melophagus ovinus* (Linnaeus), sometimes misnamed the sheep tick, is a wingless, blood-sucking fly that spends its entire life in the fleece of sheep. It may also infest goats running with sheep.

Only two stages in the life cycle of the insect are visible: the pupa and the adult. The larvae develop within the body of the adult female and mature one at a time. They are deposited in the fleece every 8–10 days and change to pupae immediately. A gluelike substance covers them when they are deposited and holds the pupae firmly in the fleece.

In about 3 weeks, adults emerge from the pupae. The adults mate within 1 week and the females begin depositing larvae in about another week. The females live for about 4 months and the males for about 3 months. The entire cycle from emergence to emergence takes about 5 weeks.

Keds are most numerous during the winter. They increase gradually through the fall until December, January, or February, when they begin to decrease. This occurs because most sheep develop a temporary resistance to them. The later an animal becomes infested, the later this protection develops. Thus, ked-free sheep brought into an infested flock late in the fall almost always have many keds on them at shearing time. This explains why some sheep have many keds at this time and others have few or none. Ewes in lamb remain heavily infested until their lambs are born, after which the ewes become resistant. The young keds then move to the lambs and the older keds die. In the fall, the resistance breaks down and the keds start to increase again.

At shearing time, half the keds are usually removed with the fleece. Because resistance has developed, very few keds that are left survive the summer.

Economic importance

In greasy wool, ked debris and excrement account for a shrinkage of 5–10%, resulting in a lower classification of wool, which is based on shrinkage, and a lower price per kilogram. However, the grade of the wool (fine, medium, and so on) is not affected.

Research at Lethbridge has shown that a ked-free lamb gains, on average, 3.6 kg more than an infested lamb over a 5-month period, and that a ked-free ewe produces 11% more wool than an infested ewe. High-energy feed allows an infested lamb to gain weight but does not improve the depressed wool growth caused by keds.

Research has also shown that sheep receiving adequate protein and vitamin A in their diet not only harbor fewer keds but are better able to withstand the stress of cold and have fewer lambing problems. The minimum dietary requirements for overwintering sheep are 10% protein and 5000 IU of vitamin A daily. Because the quality of range grasses and hay deteriorates over the fall and winter, range animals must receive supplements to get the minimum dietary requirement. Even when sheep are confined over the winter, they should receive these supplements.

Control

Control sheep keds by spraying, dipping, or dusting. If you take the proper precautions, you can keep your flock ked-free with one treatment a year. With care, eradication of keds is possible.

For range sheep, it is not necessary to move the flock back to the buildings for treatment if holding pens are available on the range. However, water will have to be hauled for spraying.

Time of treatment

The most suitable time for treatment is 1–2 weeks after shearing, when lambs have again mothered up, ewes have become used to loss of

fleece, and shearing cuts have healed. However, it may be advantageous to treat sheep at shearing time because several tasks can be done at the same time.

Do not spray or dip animals when daytime temperatures are below 5°C and allow enough time for the animals to dry off by evening. It is more convenient to dust the animals (see "Dusting") when the weather is unsuitable for spraying or dipping.

Animals that need treatment

Treat all sheep, including ewes, lambs, and rams, and goats running with the sheep. Even though most of the keds are found on lambs after shearing time, do not restrict treatment to lambs only. One infested animal left untreated can reinfest the entire flock. A ewe harboring five keds during the summer may have 500 on it by midwinter.

Treat all new stock brought into the flock, particularly rams. If you bring in new animals during the fall or early winter, keep them separate from the main flock until the weather is warm enough for spraying or use a dust treatment.

Spraying

Spraying is now the most popular method of controlling keds and in many areas has replaced dipping. For best results, treat the lambs and the ewes separately; otherwise you may miss some of the small lambs or severely injure them. Crowd the sheep into a chute (about 1 m wide) and spray the insecticide on the backs, sides, and underlines of the sheep with a high-pressure power sprayer similar to one used against cattle grubs. This method requires less labor than dipping and is simpler, faster, and easier on both sheep and workers.

Apply the spray at 14–28 kg/cm^2 pump pressure with a 1-m, angle-head gun fitted with three nozzles. When using an emulsion, use 1.2-mm disks in the nozzles; for wettable powders, use 1.6-mm disks. If you spray soon after shearing, use no more than 1 L of the mixture per animal for ewes and early lambs. A 450-L tank treats 400 ewes. If you delay the spraying until fall, up to 2 L per animal may be needed, depending on the length of fleece.

Dipping

Dipping is satisfactory if you use a dipping vat. Force the sheep into the vat and make them swim to the other end. Submerge each animal briefly to ensure complete coverage with insecticide. This method requires much more time and labor than spraying.

For small farm flocks, dip the animals one by one in a barrel containing the insecticide. This may be more economical than custom spraying or renting a sprayer.

Dusting

Power dusters may be used for applying insecticide powder. This method is popular in some parts of the United States but so far is not used in Canada. The sheep are moved through an ordinary sorting chute leading into the duster, which has eight outlets for the insecticide and blows the dust into the entire fleece.

Although this method appears to be fast and safe, it requires as much labor as spraying. Moreover, control is difficult unless the dusting is done immediately after shearing. If it is done in the fall, when the fleece has grown, two applications are recommended.

It may be necessary to treat a few animals, such as newly purchased rams, during cold weather. Dusts are sold in special containers for sprinkling by hand; work the dust thoroughly into the fleece. If such a container is not available, devise one by making holes in the bottom of a can with a tight-fitting lid (e.g., a tobacco can).

Cautions

Misuse of insecticides by failing to follow directions on the label may create hazards to livestock or humans. It may also result in illegal residues of the insecticides in the meat of slaughtered animals.

Follow closely all warnings and cautions listed on the insecticide label. In addition, do not inhale the spray or let the insecticide get on your skin. For some treatments, an interval is required between the last application and time of slaughter. The interval varies with the material used, the number of applications, and the amount applied. Allow the interval specified to avoid residues that would render the meat unfit for sale.

The table shows dilutions of commercial preparations and should be followed if they are not specified on the package label.

Insecticide concentrates for sheep keds*

Required concentration	50% wettable powder	Emulsifiable concentrate		
		25%	50%	75%
Dip (0.25%)	2.2 kg	4.5 L	2.3 L	1.4 L
Spray (0.50%)	4.5 kg	9.1 L	4.5 L	3.2 L
Spray (0.05%)	0.5 kg	1.1 L	0.6 L	0.4 L

*Add concentrate to 450 L of water for sprays and dips. Spray tanks constructed under U.S. patents usually hold 360 L.

Note: Provincial recommendations of specific pesticides are published each year. Consult your agricultural representative.

Inquiries

For more information, consult your agricultural representative or provincial entomologist, or write to Agriculture Canada, Communications Branch, Sir John Carling Building, 930 Carling Avenue, Ottawa, Ontario K1A 0C7 or Agriculture Canada Research Station, Lethbridge, Alberta T1J 4B1.

CONVERSION FACTORS

Metric units	Approximate conversion factors	Results in:
LINEAR		
millimetre (mm)	x 0.04	inch
centimetre (cm)	x 0.39	inch
metre (m)	x 3.28	feet
kilometre (km)	x 0.62	mile
AREA		
square centimetre (cm^2)	x 0.15	square inch
square metre (m^2)	x 1.2	square yard
square kilometre (km^2)	x 0.39	square mile
hectare (ha)	x 2.5	acres
VOLUME		
cubic centimetre (cm^3)	x 0.06	cubic inch
cubic metre (m^3)	x 35.31	cubic feet
	x 1.31	cubic yard
CAPACITY		
litre (L)	x 0.035	cubic feet
hectolitre (hL)	x 22	gallons
	x 2.5	bushels
WEIGHT		
gram (g)	x 0.04	oz avdp
kilogram (kg)	x 2.2	lb avdp
tonne (t)	x 1.1	short ton
AGRICULTURAL		
litres per hectare (L/ha)	x 0.089	gallons per acre
	x 0.357	quarts per acre
	x 0.71	pints per acre
millilitres per hectare (mL/ha)	x 0.014	fl. oz per acre
tonnes per hectare (t/ha)	x 0.45	tons per acre
kilograms per hectare (kg/ha)	x 0.89	lb per acre
grams per hectare (g/ha)	x 0.014	oz avdp per acre
plants per hectare (plants/ha)	x 0.405	plants per acre