

# LIVESTOCK HANDLER TRAINING MANUALS

## MODULE 3: SEASONAL PLANNING

# External parasite control in



Early identification of specific external parasites for effective eradication or control.

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### External parasite control in sheep

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Developed by Dr Danie Odendaal

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## INTRODUCTION

This manual forms part of Afrivet's series on primary animal health care (PAHC) for small stock and has been developed to help the veterinarian, animal health technician, livestock owner and livestock handler to understand the methodology used when implementing PAHC and production management.

These manuals are ideally suited as practical training aids for training livestock handlers in the principles of planned production management, disease prevention and early disease identification.

The information contained in this manual is a summary of the material used by Afrivet Training Services for the formal training of animal health technicians, extension officers, livestock farmers and livestock handlers.

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## Early identification of the specific external parasites for effective eradication or control

A basic understanding of the life cycle of the various external parasites and the damage caused by them can heighten an awareness that it is urgent to control/eradicate them in order to limit losses.

In wool-producing sheep, some specific external parasites can cause disease outbreaks, which will lead to severe loss of wool production, if they are not identified and treated early on.

Infestations by the other external parasites affecting small stock can be prevented by tactical treatment or management strategies during the season in which they cause difficulties. Regular inspections can identify the level of infestation and the urgency of the treatment needed.

The cost of using external parasite control remedies is far less than the loss of production that occurs without treatment/management.

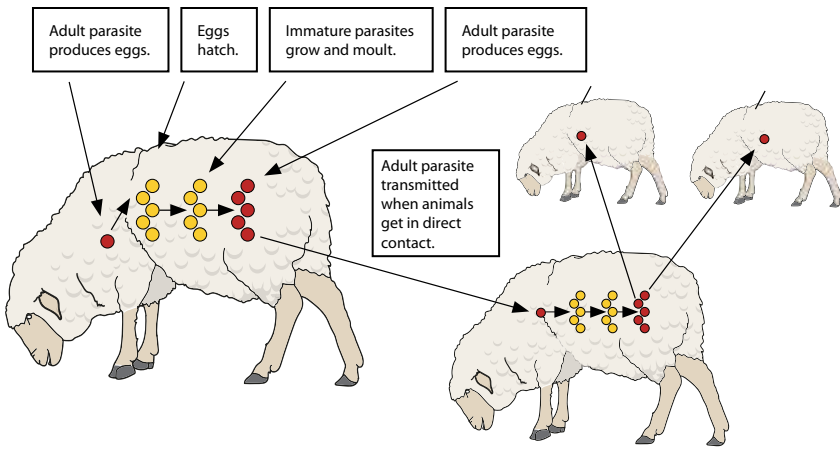
**The livestock handler plays a critical role in the early identification of external parasite infestations.**

# Transmission of external parasites

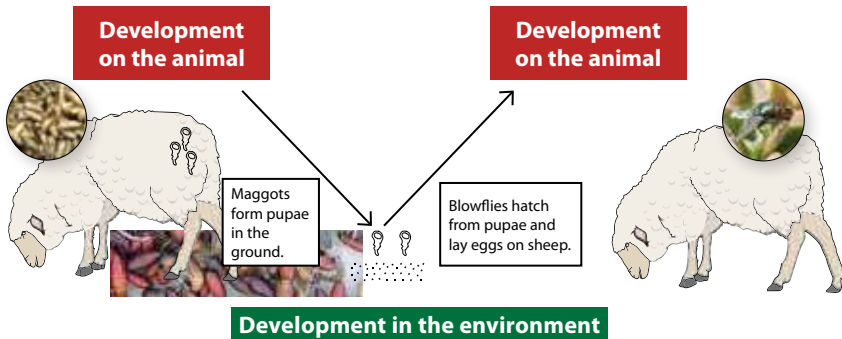
There are basically two ways in which external parasites are transmitted, based on their life cycle.

**Parasites that complete their whole life cycle on the host animals (sheep scab mites). These parasites are transmitted from one animal to the next through direct contact.**

## Development only on the animal



**Parasites that complete part of their life cycle on the host animals and part in the environment (blowflies). These parasites live on the animal only during part of their life cycle and complete the other part of their life cycle living free in the environment. These parasites are transmitted and infest animals from their free-living stage in the environment.**



## Development in the environment

# Treatment of external parasites

As a general principle, only the external parasites present on the animal can be killed through the use of a parasite-control product.

## Eradication

When external parasites complete their whole life cycle on the animal (they can survive for only a very limited time in the environment), they can be killed effectively by using parasite-control products correctly, and eradicating them from the flock and farm.

The two external parasites that can and must be eradicated effectively on farms where small stock is produced for wool farming in particular, are sheep scab mites and biting lice.

## Sheep scab



## Biting lice



## Control

When external parasites complete just a part of their life cycle on the animal and a part in the environment, the focus must be on controlling the parasite when it infests the animal because it is very difficult or impossible to eradicate these parasites completely.

**Blowflies** - Apart from treating or preventing blowfly maggots from damaging the animal, other preventive measures can be implemented to make the animals less attractive to these flies. Their proliferation in the environment can also be prevented by, for example, limiting the number of carcasses in the veld on which they can multiply.

**Ticks** - Ticks on small stock have very specific attachment sites that vary according to the different types of ticks. Spot treatment at the site of attachment is the most common method of controlling these parasites.

# Sheep scab



## Damage caused:

- Severe damage to the skin and fleece.
- Infected animals lose a lot of weight and, if left untreated, some can die.

## Disease development process

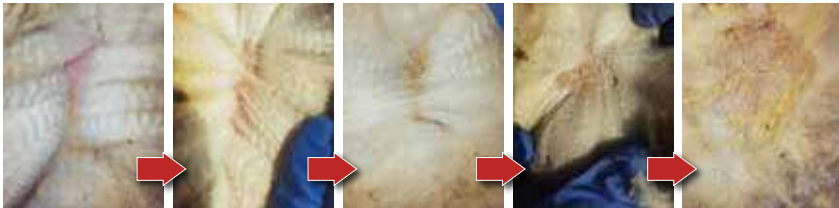
Sheep scab is caused by a small mite (the size of a grain of sugar) that feeds on the skin of sheep. Because the adult mites can easily be transmitted from one infected sheep to large numbers of uninfected sheep when there is direct contact between them, it is regarded as a big threat to the wool industry in South Africa.

The sheep scab mite has impressive reproductive abilities and can complete the whole life cycle in three weeks.

The adult mite feeds on the sheep by chewing through the skin and feeding on the serum which seeps from these small wounds. The bites cause severe irritation and inflammation, initially causing a wet wound on the skin. After a few days, a dry crust is formed in the middle of the wound.

The mites then move to the edge of the wound that is still wet and in this way causes the wound to expand the whole time until a very large part of the body is affected. New infections with very visible signs of disease are common in winter but sheep can be infected in ways that are not obvious in summer.

They will lose weight from the constant irritation and infection: rams won't mate and ewes may refuse to feed their lambs due to their discomfort.



Photos courtesy of Clinivet

**Lesions can increase very rapidly and many sheep can be affected over a short period.**



## First signs of disease

The first sign that can be observed in newly infected sheep is that they start biting and plucking at their wool. Later, pieces of wool will fall out when the sheep keep on plucking at the wool or scratching themselves against the fence. This then leaves a wet, round, superficial wound in the skin that becomes encrusted later on.

## Examination of affected animals

The purpose of examining the animals is to establish if there are other factors causing the sheep to itch such as biting lice, fleas or grass seeds.

The only definite diagnosis of sheep scab is made through a **skin scraping that can be examined under a microscope by a veterinarian or an animal health technician.**

## Prevention

A full biosecurity plan must be in place in order to prevent the parasite from entering a farm. This includes:

- Good outer fences
- Quarantine of new animals
- Rules and procedures relating to shearing teams

## Treatment

### Dipping

The only acceptable dipping method for eradicating sheep scab is plunge dipping, which allows for the effective wetting of the whole animal.

Only certain dipping compounds are registered for the control of sheep scab and the correct dilution must be used as indicated on the label.

The animals need to be dipped twice, at an interval of one to two weeks between their being dipped.

### Injectable products

- Injection with macrocyclic lactones (ivermectin, doramectin and moxidectin, etc.) is effective against sheep scab at the recommended dose. It is a very convenient means of treatment.
- To be effective, follow the registered treatment interval as indicated on the label.
- All animals must be treated and the correct dose given.
- The accuracy of automatic syringes must be checked beforehand and is of the utmost importance.

**Sheep scab is a notifiable disease, which means that an outbreak must immediately be reported to the state veterinary office. The state veterinarian can also demand that a specific treatment protocol be followed.**

# Biting lice



## Damage caused:

- **Severe damage to the fleece (long wool) due to animals scratching themselves against fences and other fixed objects like poles.**

## Disease development process

Lice are small, flattened, and wingless insects with a simple life cycle. They are permanent parasites on animals and are species specific, which makes them easy to eradicate.

Although lice are small, they are visible to the naked eye. Biting lice are about 1.8mm long and 0.6mm wide. They have a broad, reddish head and a pale brown abdomen with slightly darker brown stripes. Most biting lice are usually found near the skin.

They hatch from the nits (eggs in a protective sheath attached to the hair or wool) within seven to 14 days in the form of nymphs which moult three times before they become adults.

### **The life cycle is completed within three weeks.**

The parasites are transmitted from an infected animal to other animals during direct contact.

When wool sheep or angora goats are sheared, most of the biting lice are removed with the wool/hair. A small number of lice remain, which will start to multiply as the wool/hair grows. During the winter months, their numbers will rapidly increase on the animals that now have long wool or hair.



**Infestation can increase very rapidly in winter in sheep with long wool or angora goats with long hair.**



## First signs of disease

The first sign in infested sheep or goats is that they scratch against fences and nibble on their fleece or hair. The fleece/hair appears rough with numerous loose strands. The first signs appear when there is a rapid increase in the number of lice.

## Examination of affected animals

The purpose of examining the animals is to see whether lice are visible when the wool/hair is opened at 10 or more sites to distinguish it from sheep scab infestation. Observation must be done immediately after the wool or hair is opened because biting lice will move out of sight very quickly.



## Prevention

A full biosecurity plan must be in place in order to prevent the parasite from entering a farm. This includes: good outer fences, quarantine of new animals and rules and procedures relating to shearing teams.

## Treatment

### Dipping

Dipping animals shortly after shearing (when shearing wounds are healed) is the only way of eradicating biting lice in a flock and on a farm. Two dippings are needed at an interval of one to two weeks.



### Showering/jetting

Biting lice in animals with long wool/hair can be controlled by jetting the animals with a product registered for use in long wool/hair. This will prevent further wool damage just for long enough until the animal is sheared. This treatment is not effective enough to eradicate the infestation.



### Injectable products

Injection macrocyclic lactones **is not effective for killing biting lice** because the lice don't suck blood and therefore will not ingest the product. These products are very effective against sucking (blue) lice.

# Blowflies



## Damage caused:

- **Blowfly maggots can cause severe irritation to the animal. The damage to the skin is called sheep strike. Wounds can extend to large areas under the skin and lead to the animal's death.**
- **Secondary bacterial infection of the wounds created by the maggots can also take place.**
- **Severe production loss (wool that must be cut off when treating the wounds) and rapid loss of condition.**

## Disease development process

Female blowflies are attracted by smell to any place where there can be food for their offspring. This includes rotten material (carcasses, rotten fruit) in the environment and on animals (wounds, skin/wool/hair soiled with dung, urine, after birth fluids or exudate from skin infections).

Within 72 hours of the female blowflies laying their eggs, the larvae (maggots) begin to feed on the animal's skin using their mouthparts. As the larvae feed, they emit a smell that attracts more blowflies.

The larvae feed for three to five days and then drop off to pupate (forming a protective casing around it) in the soil. The pupae do not feed, but change from rice-like larvae into adult flies with wings and six legs inside the casing. This takes from 11 to 21 days. The casing then breaks open and the adult flies come out.



**Under good environmental conditions (warm and wet) the whole life cycle can be completed in three weeks' time. Under these good conditions, these blowflies can produce four to six generations a year. Blowfly numbers can therefore increase dramatically under favourable environmental conditions within a very short period.**

## First signs of disease

**The condition often goes undetected because it may be concealed by long wool or hair.** Sheep show signs of skin irritation by rubbing, tail wagging and trying to bite the affected areas (frequently the backside) during the first few days after the larvae start to feed.

## Examination of affected animals

Any animal showing signs of skin irritation (itching) must be examined immediately. In the case of blowfly strike, the maggots (larvae) are visible if the wool and hair are opened up in order to see the skin.



## Prevention

Focused daily observation and immediate closer inspection during the period when adult blowflies are at their most active (warm, wet summer months) and infection is suspected.

Trimming of fleece around the crutch (crutching) to prevent soiling with faeces, urine or during the lambing process.

Preventing scours (soft watery dung) by managing the animals' diet correctly and deworming small stock effectively when needed.

If a number of animals are affected over one week or if there is a recorded yearly problem during a specific period, preventive treatments must be considered.

## Treatment

### Dipping in a dip tank

This used to be common practice but is now discouraged in sheep or angora goats with long wool/hair due to the dip (pesticide) residues that stay in the wool or hair for a long time.

### Dipping by spraying the backside or other areas prone to blowfly strike

Excellent products are available that will protect the animals for long periods against blowfly strike.

### Treatment of affected animals

A product registered to treat blowfly-infested wounds must be applied immediately after such wounds have been identified. This also includes clipping the wool and hair so that the whole wound can be observed and treated effectively.



# Ticks



## Damage caused:

- The ticks with large mouthparts cause wounds that can be infected, leading to abscesses or blowfly infestations.
- Specific ticks can cause paralysis (the animal will be unable to get up), which can lead to death.

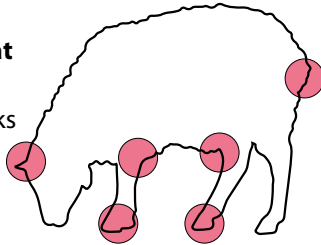
## Disease development process

Ticks affecting sheep and goats are mainly multi-host ticks with large mouthparts. These adult ticks attach to specific sites in sheep and goats and not all over the body in the way blue ticks (one-host tick) in cattle do. They mostly don't have a developmental phase on the animals and therefore just need to attach and mate. The female ticks will then feed until engorgement, when they fall off and produce eggs.

Most treatments are aimed at controlling the ticks at their site of attachment.

### Multi-host ticks that infest small stock:

- Karoo paralysis ticks
- Red-legged ticks
- Bont-legged ticks
- Bont ticks



Bont ticks between the claws, which can lead to severe lameness

## Diseases transmitted by ticks

### HEARTWATER

Sheep and goats are not susceptible to a number of tick-borne diseases such as redwater and anaplasmosis. But they do get heartwater, which is a disease transmitted by the bont tick. This disease has a very high death (mortality) rate in susceptible small stock and is an important limiting factor for small stock production in areas where this disease occurs.



## First signs of disease

The only ticks that cause specific signs of disease are ticks causing paralysis and lameness. The other ticks are not easily visible.

## Examination of affected animals

Because most ticks don't cause very specific signs of disease and are not as visible in sheep and goats, a weekly inspection of the attachment sites is needed in order to decide on the urgency and need for treatment. Inspect the following areas:

Inside ears and on the face, armpits, belly and groin, under the tail (vulva and udder in female animals and testes and sheath opening in male animals), front, between and back of the claws.

## Prevention

Ticks are seasonal and because the immature ticks feed on other small animals and birds, prevention of tick infestation is not practical.

The exception is the prevention of ticks causing paralysis where pour-on dips are applied to the attachment sites of these ticks. This can be done because these ticks infest sheep during a specific period just after the start of very cold weather (the first frost). These ticks occur and cause this condition only in a small part of the country.

## Treatment

### Dip tanks used for dipping

This is not a common practice for the specific control of ticks but is mostly used for treatment against sheep scab and biting lice.

### Foot baths and belly baths used for dipping

In cases where tick infestation of the claws leading to lameness is a severe problem, foot baths with a dipping compound can be used for weekly treatment against these ticks.

### Spot treatment

Tick grease can be very effective to treat ticks at the attachment sites. Pour-on remedies (total dose divided into equal parts and applied to attachment sites) can also be used for this purpose. Hand-spraying is a very common and effective way of treating ticks at the attachment sites.

### Injectable products

Injecting macrocyclic lactones is not effective for tick control in small stock because **it is not effective against the adult multi-host ticks.**

For small-scale farmers that need to treat up to 20 animals, tick grease is the most cost-effective way of controlling ticks.



Wear gloves and apply tick grease to attachment sites like inside ears, between and behind claws.

## Other external parasites of small stock

There are a number of other external parasites that can infest or feed on small stock which are briefly mentioned here due to limited space available in this module.



**Keds** – Keds are big (4mm to 6mm long) brown, wingless, blood-sucking flies that live and feed on sheep. They look a bit like ticks but don't attach like ticks and have six legs because they are insects. With their sharp mouthparts they penetrate the skin and suck blood for a short period each day. They also complete their whole life cycle on the sheep.

This feeding causes irritation, wool damage and blood loss. Most remedies that kill biting lice can also be used to kill these parasites and they can also be eradicated from a flock and farm if two follow-up treatments are used after shearing.



**Screw worms** – These parasites that are not worms like the common name indicate, but are maggots (larvae) of a specific type of blowfly that infest small wounds. This condition was previously commonly seen in cattle but now sheep and goats are also affected in some areas of South Africa. While feeding, these maggots are tightly packed into the wound and cause the wound to increase in size and deepen as they grow, before falling out of the wound to form pupae in the ground. This condition can be treated with injectable products like ivermectin or other products that are effective against blowfly maggots.



**Midges and mosquitoes** – Both are flying insects that feed on sheep and goats. In sheep, midges are the main vectors that transmit bluetongue to sheep and mosquitoes are the main vectors that can transmit Rift Valley fever to sheep and goats. Both these blood-sucking parasites can also cause irritation and some blood loss.



Vaccination against these diseases is the only long-term way in which these insect-transmissible **diseases can be prevented**.

Transmission of these diseases can be prevented in susceptible animals by spraying animals weekly with a dipping compound containing deltamethrin, but this is only practical for short-term prevention in unvaccinated animals.



## Afrivet products registered for the control of external parasites in sheep and goats

Product Name	Active Ingredient	Application method	Afrivet Product	sheep scab	Biting lice	Sucking lice	Blowfly treatment	Blowfly strike prevention	Blue ticks	Multi-host ticks	Paralysis ticks	Keds	Flies and flying insects
Ecomectin 1%	Ivermectin	Injectable	Ecomectin 1% Reg.: G2275	√		√	√		√				
Expel Plus Jetting fluid	Ivermectin 3% m/v; Novaluron 2% m/v	Spray on Jetting	Expel Plus Jetting fluid Reg.: G3941	√	√		√	√					
Afrivet Redline	Flumethrin 1% m/v	Pour on - oil based	Afrivet Redline Reg.: G3445						√	√	√		
Deltapor 10 Plus	Deltamethrin 1 % m/v; Piperonyl butoxide 3,00 % m/v	Pour on - oil based	Deltapor 10 Plus Reg.: G1447						√	√	√	√	√
Deltapor 5	Deltamethrin 0,5 % m/v; Piperonyl butoxide 2,5 % m/v	Pour on - oil based	Deltapor 5 Reg.: G3433						√	√	√	√	√
Eraditick Plus	Amitraz 1,5 % m/v; Deltamethrin 0,50 % m/v; Piperonyl butoxide 3,0 % m/v	Pour on - oil based	Eraditick Plus Reg.: G3434		√	√			√	√	√	√	√
Eraditick 125	Amitraz 12,5 % m/v	Plunge dip & spray	Eraditick 125 Reg.: G3189	√	√	√			√	√	√		
Deltaforce 100	Deltamethrin 10 % m/v	Plunge dip & spray	Deltaforce 100 Reg.: G1348	√	√	√	√		√	√		√	√
Eraditick Grease	Deltamethrin 0,10 % m/m; Piperonyl butoxide 0,05 % m/m	Patch treatment	Eraditick Grease Reg.: G3667						√	√	√		
Expel Wound Spray	Resins and oils 99,39; Germicide 0,51; Deltamethrin 0,10 % m/m	Aerosol spray	Expel Wound Spray Reg.: G3245				√	√					

NB: Please note √ = These specific indications have only been registered for cattle.

## EXPEL PLUS JETTING FLUID

EXTERNAL PARASITE REMEDIES SPRAY

G4027 (Act 36/1947)

Ivermectin 3 % m/v / Novaluron 2 % m/v

Kills red lice on sheep & goats. Kills blowfly maggots in sheep and kills sheep scab mites. Prevents blowfly strike for up to 16 weeks.



**Plunge dip (fresh fill):**

1 L / 1 000 L water

**Plunge dip**

**(replenishment):**

1 L / 1 000 L water

**Jetting:** 1 ml / 1 L water

**Sheep scap mites:**

Two treatments with an interval of 7 – 10 days as a plunge dip

**Withdrawal period: Meat:** 70 Dae  
**Milk:** Not for human consumption

Registration holder: Afrivet Business Management (Pty) Ltd, Co Reg 2000/011263/07



**Plunge dip (fresh fill):**

1 L / 1 000 L water

**Plunge dip**

**(replenishment):**

1 L / 1 000 L water

**Jetting:** 1 ml / 1 L water



Packaging available

1 L, 5 L

## ERADITICK PLUS POUR-ON

EXTERNAL PARASITE REMEDIES POUR-ON

G4251 (Act 36/1947)

Amitraz 1,5 % m/v / Deltamethrin 0,5 % m/v / Piperonyl butoxide 3 % m/v

**Cattle:** Controls ticks. Controls stable flies, horn flies, cattle louse flies and nuisance flies e.g. house flies. Kill lice (biting and sucking) and mange mites. Protects against black flies.

**Sheep & Goats:** Controls Karoo paralysis-, bont-legged and red-legged ticks.

OXPECKER COMPATIBLE.



**Withdrawal period:**

**Meat:** 7 Days

**Milk:** None

Registration holder: ECO Animal Health Southern-Africa (Pty) Ltd, Mpy, Reg. No. 1992/000835/07



Packaging available

1 L, 5 L, 10 L

 1 ml/10 kg  1 ml/5 kg

## ERADITICK GREASE

EXTERNAL PARASITE REMEDIES TICK GREASE

G3667 (Act 36/1947)

Deltamethrin 0,1 % m/m / Piperonyl butoxide 0,5 % m/m

Patch treatment for the control of ticks at the site of application.



**Withdrawal period:**

**Meat:** None

**Milk:** None

Registration holder: Afrivet Business Management (Pty) Ltd, Co Reg 2000/011263/07



Packaging available

500 g, 4 kg