

Paper No. 25.

SHEEP SCAB.

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IN view of this assembly of State Veterinarians, I thought it would not be out of place to introduce the question of Sheep Scab inasmuch as this is frequently one of the most difficult problems the State veterinarian is faced with, and past records demonstrate that very few Governments have been lucky enough entirely to eliminate the scab mite.

A striking example of this is Great Britain, a country where only civilized farmers farm sheep, and one would imagine that under entirely European conditions it should not be difficult to exterminate sheep scab.

The difficulties in Africa are well known, as is also the fact that in the Union of South Africa millions have been spent during the last fifty years in trying to eradicate sheep scab. So far, it has been an easy victory for the scab mite.

Africa, I think, presents many difficulties that are peculiar to herself and among such may be named her vastness, idiosyncrasies of the sheep-owner, and, probably the most important, her weather vagaries, some of which are peculiarly favourable to the increase of the scab mite, and I am sure all of us who have handled the treatment of scab know what it means to deal with serious outbreaks of scab during a prolonged droughty spring, when not only are the sheep in a deplorable condition of poverty and scab, but one may be faced with the fact that there is no water to dip the flocks in.

In Basutoland I have been carrying out a serious endeavour to eradicate scab since 1923, and during this time I have had ample opportunity for making many observations on this disease. These observations have clearly indicated how difficult it is to eradicate scab from a country full of sheep and where scab has been rampant up to the time our campaign was started.

In Basutoland it is estimated we have 2,000,000 sheep, and these are more or less evenly distributed throughout the Territory, but our best sheep country is in the true mountain areas varying from 7,000 to 11,000 feet high, where material for building and supplies can only be sent on pack animals, and to erect tanks in these localities makes the work costly and difficult, but I am glad to say the erection of tanks is progressing very favourably and nearing completion; at the present moment we have 153 tanks in operation, and it is anticipated 190 tanks will be sufficient to give every sheep-owner the necessary facilities for dipping his sheep.

In presenting this paper, it is not my intention to go into those details of scab that every State veterinarian is familiar with, but to sketch an outline of the policy adopted in Basutoland and which has hitherto been attended with very considerable success, and point out

to you the important factors that I think are necessary in dealing successfully with scab. The policy I have adopted is as follows:—

1. Erection of well-constructed circular tanks at intervals of about 12 miles and defining a tank area on each tank.
2. Appointing and training a native Dipping Supervisor for each tank.

3. The simultaneous dipping of all sheep and goats in that proclaimed area twice.

4. The hand-dressing and dipping of all infected sheep three times, and in badly infected flocks the whole flock is dipped three times.

5. The careful branding of all sheep with red and black tattoo oil—each area having its own special brand.

6. The marking of all infected sheep in each flock, and taking an accurate count of the numbers of each flock and infected sheep at each dipping.

7. The dipping of all flocks, found infected during simultaneous dipping, twice before the advent of winter.

8. Controlling all movement of sheep from one area to another and in non-protected areas allowing no movement until the flock is inspected and passed clean and dipped; sheep to be accompanied with order to report to tank area of destination, where sheep are inspected and dipped again.

9. No infected flocks in tanked areas allowed to move until they have passed through three dippings.

10. Sheep travelling from areas where no tanks exist to call at first tank en route, where they are dipped and then allowed to move on with permit to their destination. If the flock is passed clean, then it is dipped again on arrival; if scabby, it completes a third dipping.

This is the procedure adopted in my Territory, and I will now attempt to give you some details of the treatment of scab that experience has shown me is of importance if successful results are to be obtained.

DIPPING TANKS.

I do not think there is any doubt the best tank is the circular one, as it ensures a thorough immersion of the sheep. Our tanks hold from 500 to 650 gallons and 6 or 8 sheep can be safely dipped at once. It is very important *no shoulder* is made in erecting the tank, otherwise sheep are able to stand out of the water—the tank should be wine-glass in shape. It is important a reliable 2-minute sand-glass is employed.

DIPPING MATERIAL.

As you are aware, extensive experiments have been carried out in the last few years in order to ascertain which of the proprietary dips are the most efficient, and much interesting and valuable work has been done by Green and Bedford at Onderstepoort, and, no doubt, most of you have read their observations. They report most favourably on nearly all the dips on the market, but as a prophylactic the arsenical dips appear to be the best.

In carrying out the dipping of huge numbers of sheep, efficiency of the dip utilized is all important, but the economic aspect must be considered also, and it is for these two reasons that I finally decided to adopt Cooper's Dip. Our observations show that Cooper's Powder Dip, when a correct diagnosis is made and thorough hand-dressing is done, is an efficient dip, but in practice one sometimes finds a correct diagnosis is not made, resulting in a recurrence of the disease.

The importance of a "fool-proof" dip cannot be over-estimated, and I have frequently pointed this out to Messrs. Cooper, and recently they have evolved a new arsenical dip, which they asked me to try. I arranged with them to dip 15,000 sheep in a mountain area, where no dipping had taken place, and the flocks were badly infected with scab.

In using this dip, I decided to put it to the most severe possible test and rely entirely on a 2-minute immersion without hand-dressing, but wash out the ears and orbital fossae with a brush only, and use two dippings at an interval of nine days. In handling these flocks, we found scab worse than we anticipated, and no dip could have been put to a more severe test. We left these flocks for nearly four months after the completion of our dipping and then had a very thorough table inspection of the worst infected flocks. The results were excellent and, in view of the fact that no hand-dressing took place, far better than I could have anticipated, and I am sure in this new Cooper's Dip we have made a most valuable step in the eradication of scab. This dip is used at full strength instead of half strength for second dipping, and in practice where one employs a native staff, this, I am confident, is an advantage, though of course it is not so cheap.

As the result of our experiment, I have now decided in future to adopt this dip throughout the Territory.

DIAGNOSIS OF SCAB.

In theory it should be a comparatively easy matter to diagnose scab, but in practice undoubtedly it is often difficult, and it is this factor, I am sure, that contributes so largely to the difficulties of scab eradication.

To determine whether a flock of sheep is clean or otherwise, it is absolutely necessary that every sheep is caught, placed upon the table, and given a very thorough optical and manipulative examination.

In Basutoland to-day no one is permitted to give a clean bill unless this is done, and the wisdom of this procedure is constantly demonstrated.

All flocks when brought to a tank, either for dipping or inspection, are treated in this way.

Experience has demonstrated that a very common site for scab is the perineum, testicles, round the penis and brisket; and this is a particularly common seat of infection in rams, and in such circumstances it is an impossibility to detect these infections by an optical examination in the veld or kraal.

The perineum, is a particularly favourable spot for the scab mite to feed, and it is frequently difficult to detect old scab in this locality unless one carefully manipulates the seat of infection, and it is only

on detecting the indurated skin associated with the characteristic itching on manipulation that one is enabled to make a correct diagnosis. There is no doubt in my mind that a healthy, vigorous ram can have scab at this spot for months and remain undetected until something happens to reduce the vitality of the ram, and so enable the mite to make headway and migrate to some spot on the skin where the infection is easy to see, or until the infected ram is put with the ewes and an unexpected infection commences amongst them.

The importance of the ram in diagnosing scab and clearing up mysterious outbreaks cannot be over-estimated, and all my staff are now thoroughly trained in this direction.

In observing scab one cannot help being struck with the variability of the natural resistance of individual animals to the scab mite. It is not uncommon to meet with cases where a patch of skin has undergone hardening, harbouring the scab mite, and apparently little or no irritation is manifested by the sheep, with no resulting wool disturbance; and it is these cases that only a careful manipulative examination of the sheep will bring about an accurate diagnosis. No doubt these particular sheep can remain in this condition for several months undetected as long as their surroundings are inimical to the spread of the disease. These sheep play a very important rôle in the upkeep of scab, and unless they are recognized and dealt with, there is no possibility of the successful eradication of scab.

Bedford, in carrying out observations at Onderstepoort on scab, has rightly drawn attention to the importance of a possible infection of the ears, and pointed out that head immersion is not sufficient to destroy the mite when they reside inside the ear. In carrying out scab experiments in Basutoland in conjunction with Messrs. Cooper's, my attention was drawn to the presence of scab mites in the orbital fossa of sheep by Mr. Shoebottom, who, with Mr. Dixon, had charge of the experiments, and since then field experience has demonstrated the importance of this observation. This site, like the perineum, is always in a moist condition and apparently very favourable for the existence of the scab mite. Little or no local disturbance takes place at this site, and the mite can only be detected either by noticing the sheep rub their heads against the kraal wall, or by carefully scraping out the contents of the fossae and examining them for mites. Like the ear, the head immersion is not efficient in getting at this spot, and in Basutoland all infected scabby sheep are not considered efficiently hand-dressed unless their ears and fossae are washed out with a small brush, using a mixture of fuel oil and sulphur. The importance of this precaution, I am sure, cannot be over-estimated, and without it I don't think scab is going to be finally eradicated.

Another site one should be very careful to manipulate is round the base of the horns, an easy spot to miss and a difficult place to treat unless careful hand-dressing is employed.

KRAAL INFECTION.

You are all aware of the valuable experiments carried out at Onderstepoort in ascertaining the time a kraal remained infected after removing scabby sheep. The result of these experiments came as a great blow to many farmers and sheep inspectors, and once and for all eliminated the old-time unanswerable excuse for their frequent incompetency and carelessness.

Unless these experiments were borne out by practice in the field, then it would be impossible to eradicate scab in Basutoland, as in the lowlands thousands of sheep are kraaled every night, and it is useless instructing owners to do otherwise.

No attempt has been made by us to avoid infected kraals after dipping unclean flocks, and we have a vast number of observations to support the correctness of the Onderstepoort experiments.

MORTALITIES FROM DIPPING.

In using an arsenical dip, one naturally expects some deaths from dipping, but we have in the last few years reduced this to a minimum. Careful records of all animals killed by dipping showed that 75 per cent. of the casualties took place amongst those sheep that entered the tank first after making a fresh mixture of the dip. This suggested improper mixing, and since we have adopted the policy of allowing no sheep to go into a freshly mixed tank until 15 minutes has elapsed after mixing, our deaths have been reduced to a minimum. During 1927 we dipped 2,118,319 sheep and goats with 83 casualties, and in 1928 we dipped 2,242,918 sheep and goats with 106 casualties.

It is important Cooper's powder is thoroughly mixed, and we go to a lot of trouble in doing this; not more than four packets are employed at once in a large bucket, and after very thoroughly mixing in the bucket the contents are passed through a grain bag into the tank. With the New Cooper's Dip this will not be necessary; the powder in this case is more soluble and easier to mix.

As State veterinarians, the financial aspect of a scab campaign cannot be overlooked, as without funds one cannot hope to carry out the provisions of enforcing a successful scab campaign, and as all Governments know in the past the machinery necessary to enforce a scab crusade is a very costly business.

In Basutoland we have successfully overcome this difficulty by making the sheep-owner pay for this work. To commence with, we put an export duty of $\frac{1}{4}$ d. per lb. on all wool exported; but as our tanks increased this was found insufficient, and we have now raised the tax to $\frac{1}{2}$ d. per lb., and this is now found sufficient to pay all expenses.

In carrying out our policy, all dipping is free, and I am sure it is not necessary for me to emphasize to you as State veterinarians what that means to my staff and to the innumerable sheep-owners, and it is this policy which assists so largely in bringing about the loyal co-operation of the sheep-owner, a factor that is absolutely necessary if one aspires to the complete eradication of scab.

It is of the utmost importance to see that a comprehensive Scab Law is in force and one suitable to the local requirements of one's Territory, and in addition it is also essential one should have the sympathy and co-operation of the Magisterial Branch of the Government in this difficult work. Without these two factors it will be found impossible to produce that state of discipline amongst sheep-owners that is a necessity when scab eradication is aimed at.