

# A short history of sheep scab

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## Abstract

The history of sheep scab is briefly discussed since it was first mentioned in 180 BC. It was probably introduced to South Africa by the early settlers and was mentioned as a problem by Simon van der Stel, although its cause was only discovered in 1809. Various measures taken over the centuries to control or eradicate the disease, which has always been of considerable economic importance, are discussed, as well as the failures and reasons why it is still with us today.

Sheep scab is a serious skin condition of sheep. A minute mite *Psoroptes ovis*, hardly visible to the naked eye, causes it. The mites cause an exudative dermatitis characterised by scab formation and intense itching that results in scratching, rubbing, wool loss, wounding and emaciation. Initially small lesions enlarge and fuse to sometimes extend all over the body. The mites can be transmitted directly through sheep to sheep contact or indirectly through rubbing on the same posts or fencing. The disease is highly contagious and can spread rapidly throughout a flock<sup>2,5</sup>. Sheep scab is one of the worst diseases from which an animal can suffer.

Sheep scab is one of the oldest known diseases of sheep and is probably the same as the disease mentioned in the Bible (Leviticus 22, 22) and, according to Kirkwood<sup>4</sup>, was also discussed by authors such as Cato (180 BC) Virgil, Pleno and Columella. The word 'scab' is derived from the Latin scabere, which means to scratch. Despite the fact that the mite is visible to the naked eye it was not identified as the cause of sheep scab until 1809 by Walz. Cato, in 180 BC, advised treating sheep after shearing with equal parts of olive oil dregs, water in which lupins had been steeped and lees of a good wine. Similar ointments containing mercury and lard were still being used in the middle ages. An indispensable part of the shepherd's equipment was his tar box containing an ointment of tar, butter and lard. Washes applied by hand containing lime, mercury, nicotine, turpentine or arsenic were popular until the end of the 18th century.

Dipping by total immersion of sheep was not introduced until 1800. This was an arduous task because it was usually done in a tub. Dipping below ground level did not become popular until the middle of the 19th century after the method had been widely used in Australia. The first commercial dip was a wettable powder that contained arsenic and sulphur. It was developed and marketed by William Cooper in 1843. This was followed by formulations of coal tar, creosote, crysallic acid, rotenone, lime-sulphur and arsenic preparations. The introduction of Gamma-BHC in 1948, which remains acaricidal in the fleece for several weeks, made control of sheep scab very effective but it

was later replaced by less persistent organophosphates and synthetic pyrethroids.

According to Kirkwood<sup>4</sup>, the earliest attempt to legislate against sheep scab can be traced to King Hywel Dda of Wales in AD949, who prohibited the sale of scabby sheep from November to April. He also ruled that sheep should not be placed on land which had been occupied by scabby sheep during the past 7 years. In Britain the first legislation to control sheep scab was introduced in 1798 to prevent the movement of sheep infested with scab or mange. The disease was first made notifiable in that country in 1898 and local authorities were required to arrange veterinary investigation of reported cases. In 1905, much later than in Australia and

South Africa, it became compulsory to dip all scabby sheep and since then all scab dips had to be government approved. In 1905 regulations stipulated that sheep must be immersed in the dip for at least 30 seconds. By 1914 it became clear that a single dipping in the compounds then used did not kill the eggs of the mites, which hatched 3–4 days after the dipping. Consequently a 2nd dipping within 11–14 days of the 1st was introduced. In 1926, it was realised

that dipping for only 30 seconds, even twice within 14 days, was not fully effective. Since then a minimum period of 60 seconds has been required.

In South Africa sheep scab has been a problem since the 17th century when it was presumably introduced by the importation of European sheep. According to Van Heerden<sup>6</sup>, Simon van der Stel, in a note to his son and successor, warned him against butchers who sell inferior, scabby sheep to the troops and citizens of the Cape. In 1693 he promulgated regulations to prevent the spread of the disease and stated that infested sheep contaminate corrals and pastures. Sheep scab remained a problem, undermining the income of sheep farmers in the Cape, which mainly depended on the export of wool in competition with Australia, which had the disease under control by the 1860s. By 1874, regulations that were not strictly enforced existed to combat the disease. Ordinance 11 of 1885 provided an amendment to the sheep scab act in the Cape that introduced compulsory measures. A special unit with scab inspectors and scab councils was appointed.

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A chief inspector of sheep, with many assistants and inspectors, attempted to enforce the legislation to control or eradicate scab under very difficult conditions of which martial law, severe droughts, inadequate dipping tanks and a lack of water to fill the tanks were the main obstacles. The 1894 Scab Act made dipping compulsory on a national basis but met with intense opposition. It caused serious tension between the government and farmers and also between commercial producers and less prosperous farmers or pastoralists. It even threatened the stability of the Rhodes-Afrikaner Bond government in the Cape Colony<sup>1</sup>. Apparently scab and stock theft were the most frequently discussed subjects at farmer meetings and in editorial columns and had serious political implications for the country. The next decade or 2 saw amendments to the scab regulations based on experience and research conducted to verify or adapt overseas data on the epidemiology of scab. All these efforts led to a marked decrease in the incidence of the disease and by the late 1930s sheep scab was thought to have been eradicated. However, between 1940 and 1966 periodic outbreaks of the disease were still reported in certain parts of the country. In some instances these outbreaks were attributed to illegal movement of sheep between South Africa and neighbouring countries.

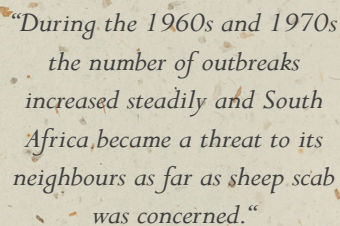
During the 1960s and 1970s the number of outbreaks increased steadily and South Africa became a threat to its neighbours as far as sheep scab was concerned. In March 1975, 9 Merino rams were purchased by the Government of Lesotho from a farmer in South Africa for the purpose of breed improvement in Lesotho. At the time it was not realised that the sheep were infected with scab and Lesotho, one of the few countries in the world to have eradicated the disease, was re-infected<sup>3</sup>. In 1976 a liaison committee was established between members of the Department of Agriculture and the Veterinary Chemical Association of South Africa (AVCASA) to research and develop additional chemical compounds for the control of sheep scab. This was done in an attempt to replace the highly effective Gamma-BHC dips that had to be withdrawn from the market due to their negative environmental impact and concerns for human health due to residues in the meat and fleece of treated animals.

Sheep scab had become so widespread in South Africa that additional measures were necessary to contain the disease. In 1978 a decision was made to introduce a single compulsory dipping for all sheep within a specific time period. It was hoped that such an event would reduce the

prevalence of the disease to a few foci that could be cleaned up with simultaneous dippings. The first compulsory dipping took place between 1 October 1979 and 31 January 1980. Many farmers cooperated in this event but unfortunately some did not and by the end of January 1980 there were still many undipped sheep in South Africa. The compulsory dipping programme continued during the years 1981–1985. Initially there was a decrease in the number of outbreaks but it did not succeed in controlling the disease and the programme was suspended on 30 June 1985. After that the disease remained a notifiable disease but the responsibility for the control was now transferred to the stock owner. By the end of the 20th century it had become clear that attempts to control or eradicate sheep scab with toxic chemicals are fraught with difficulties. Ecological concerns about toxic residues in meat and fleece, operator safety and the development of parasite resistance are all undesirable features of chemical control. These problems have led to an upswing in the search for alternative methods of control such as the development of effective vaccines, biological control with fungi or bacteria and the breeding of genetically resistant animals.

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