Cattle Scab and Its Control

BY RUDOLPH SNYDER

COMMON SCAB of cattle, once widespread and serious in this country, has been almost eradicated, but sarcoptic scab, once rare, is now becoming a real menace. These and the two other types of cattle scab are discussed in this article.

In his annual report for 1902, the Chief of the Bureau of Animal Industry referred to numerous inquiries about a disease commonly known as Texas itch. As the disease appears to have been more prevalent in other sections of the country than in Texas, it seems strange that this name was applied to it. At that time the disease was apparently fairly common among the range cattle of the West and Northwest, and it had also been heard of in other parts of the country. Investigation showed that the condition was scabies, a contagious skin disease commonly known as scab, mange, or itch, caused by insectlike parasites called mites.

There are four species of the scabies parasite which affect cattle, and they belong to four different genera—Psoroptes, Sarcoptes, Choriopites, and Demodex. The psoroptic mites, which cause common scab, live in groups or colonies on the surface of the skin, and the lesions, or damage to tissues they cause, spread in all directions from the spot first affected. The sarcoptic mites, which cause what is known in some regions as barn itch, bore into the skin, each female making a separate gallery in which she lays her eggs. The chorioptic mites live in groups on the surface of the skin and usually remain localized on the legs or tail with little or no tendency to spread. The demodectic mites are microscopic in size and are more like worms than typical mites; they live in the hair follicles and sebaceous (sweat and oil) glands and cause smooth spherical swellings, or pustules, in the skin.

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PSOROPTIC, OR COMMON, SCAB

The mites causing psoroptic, or common, scab of cattle were encountered throughout the range and semiarid States in the early 1900's. Although not so dangerous a disease as sarcoptic scab, psoroptic scab caused more extensive losses to the livestock industry because of its greater prevalence. It occasionally occurs on cattle in farming communities in various parts of the country, and, unless properly treated, causes great losses through reduction in weight, failure of young stock to thrive and gain weight normally, and an increase in the death rate, especially among cattle in a state of poor nutrition and low vitality when they are exposed to inclement weather.

The mites that cause common cattle scab are small white or yellowish parasites known technically as *Psoroptes equi borus*, or perhaps more often as *Psoroptes communis borus*. The female when full grown measures about one-fortieth and the male about one-fiftieth of an inch in length. They are visible to the naked eye, especially when placed on a dark background. The entire life cycle is passed on the body of a host animal. Each female may deposit 15 to 24 eggs, which hatch after 3 or 4 days' incubation. The young mites reach maturity and mate, and the females of the new generation deposit eggs in 10 to 12 days.

The mites may attack any part of the body that is thickly covered with hair. The first symptom of the disease is usually an intense itching of the skin on the withers, on the top of the neck just in front of the withers, or around the root of the tail. From these points the lesions spread over the back and sides and, unless checked, may involve practically the entire body.

The most certain diagnosis consists in demonstrating the presence of the parasite that causes the disease. This may be done by scraping the outer edges of the infected areas with a blunt-edged knife and transferring the scrapings to a smooth black surface, such as a piece of black paper. Spreading the scrapings in the warm sun or near artificial heat usually causes the mites to become active, and they can be seen as minute, gray, moving bodies against the dark background. Well-advanced cases of scab are usually easy to diagnose, but the disease should never be allowed to reach this stage; in the early stages it yields readily to proper treatment, but if allowed to spread it will entail heavy losses.

The transmissibility of the disease is not limited to any one season of the year, although cattle on green, succulent feed and in a thriving condition seldom contract scab. In fact, in the spring, when infected cattle are turned out on green grass, the old coat of hair is shed, and the disease often seems to have been cured. It will usually break out again, however, with the coming of cold, stormy weather.

Although the infected animal is the most important factor in spreading cattle mites, infected premises should not be overlooked. Owing to the varying conditions that may affect the ability of the mite and its eggs to remain alive when separated from a host, it is impossible to state definitely how long premises may remain infectious after the removal of the cattle. Hence, it is advisable to clean and disinfect all
infected sheds, barns, yards, or small inclosures thoroughly before using them for clean or dipped cattle. There are a number of cresylic disinfectants which when diluted in accordance with instructions on the container are suitable for this purpose. (See the article on Disinfection and Disinfectants, p. 179.)

**CONTROL MEASURES**

The only rational way to treat cattle scabies is to use some external application that will kill the parasites without injuring the animals. Dipping is the method most commonly used to accomplish this. It consists in immersing the animals in a medicated liquid that will thoroughly wet the entire surface of the body and kill the parasites. It is the only method recognized by the Bureau of Animal Industry in the official treatment of scabby cattle because it is the most practical and effective. Dipping plants are usually arranged so that the cattle enter one end of a vat filled with the dip, swim through it, and leave the vat at the opposite end. The dips commonly used by the Bureau of Animal Industry and permitted for use in official dipping of cattle for scabies are lime-sulfur solution and a nicotine solution.

The stages in the life cycle of the mite have an important bearing on the interval which should elapse between treatments for common scab. Dipping properly done will kill the mites but cannot be depended upon to destroy all the eggs, and the animals should be dipped a second time before the newly hatched mites have had time to develop and deposit eggs. Practical experience has shown that the interval between the first and second dippings should be 10 to 12 days, although in some instances this may be safely extended to a maximum of 14 days.

During 1903 some preliminary inspections and dippings were carried out, and in 1904 regulations were issued which placed in quarantine that part of the United States lying west of the Mississippi River and the eastern boundary of Minnesota. This quarantine specified the manner in which cattle could be shipped to other States from the area. In 1905 the quarantine was modified to include only those areas in which the disease was prevalent. During that year a large force was placed in the field by the Bureau of Animal Industry to make inspections and supervise the dipping of exposed and infected animals. From 1904 to 1911 cattle scabies seemed to be increasing rapidly in many States, but after 1911 the effects of the systematic eradication measures carried on by the Bureau in cooperation with the livestock sanitary officials of the various States became apparent. The common variety of cattle scabies has been practically eradicated, and at the present time no territory is under Federal quarantine for this disease.

**SARCOPTIC SCAB**

Sarcoptic scab or mange, or barn itch, is found more or less frequently on both farm and range cattle throughout the country. Owing to its comparative rarity, it was not formerly considered of much im-
importance in the United States, but during the last few years it has been increasing and must now be considered a major problem. The disease is more serious than common scab because it is more severe in its effects and more difficult to eradicate. It sometimes develops in purebred cattle, and animals from purebred herds may carry the infection although they may not show visible symptoms of scabies at the time they are shipped. Purebred bulls of the beef breeds seem to be especially susceptible and may be an important factor in spreading the disease. The breeder of purebred cattle who supplies bulls for building up range and farm herds finds his business very nearly ruined when sarcoptic scabies develops in his herd. In dairy herds it may seriously affect milk production and throw the balance on the wrong side of the ledger. The disease can be eradicated, however, and if proper methods are adopted before it reaches an advanced stage the losses can be reduced to a minimum.

The parasites *Sarcoptes scabiei* var. *caprae*, which cause sarcoptic scab, resemble in a general way the common scab mites. The entire life cycle is passed on the body of the host animal, but the sarcoptic mites do not remain on the surface; they penetrate the outer layer of the skin and excavate burrows or galleries in which mating occurs and the eggs are laid. When egg laying is completed the female dies in her burrow.

The mites prefer locations where the skin is tender and the hair is thin. In the early stages of the disease the lesions are usually found on the inner surfaces of the thighs, the under side of the neck or brisket, or around the root of the tail. From these parts the entire surface of the body may become involved.

Sarcoptic scab is transmissible from one species of animal to another and also from animals to man. Sarcoptic mites of the horse, sheep, goat, and cat may live on cattle, while those of the horse, dog, and hog are known to be readily transmissible to man; but ordinarily, when one species contracts the contagion from another species, the mites live only a short time on the newly infected animal. Sarcoptic scab of cattle is contagious to all classes of cattle and is transmitted by direct contact with animals or objects that are carriers of the mites.

It is evident, therefore, that all stables and small enclosures occupied by mangy cattle and all implements and coverings, such as curry-combs, brushes, and blankets, should be cleaned and disinfected before they are used for clean or dipped cattle. The cleaning and disinfection should be done in the same manner as for common scab.

Probably on account of their burrowing habit, sarcoptic mites are much more difficult to eradicate than the common scab mites. The dips recommended for the latter will kill sarcoptic mites if the liquid comes in contact with them, but it may not reach all the mites at one application. Persistent, thorough, and frequent application of the dip will effect a cure, however, especially if all infected parts are scrubbed well with a brush and soaked with dipping solution just prior to the first dipping. Experience has shown that four dippings in either a lime-sulfur or a nicotine dip will cure sarcoptic scab in cattle. The interval between dippings should be 6 to 10 days.
One dipping in crude petroleum usually cures sarcoptic scab, as it seems to destroy the eggs as well as the mites. A serious drawback to its use as a dip for cattle, however, is that in some cases it is injurious to the animals.

**CHORIOPTIC, OR SYMBIOTIC, SCAB**

Chorioptic, or symbiotic, scab occurs occasionally in cattle, but it is of less importance than either of the two varieties already described. It is caused by a mite called *Chorioptes bovis*, which under a high-power magnifying glass closely resembles the common scab mite. Though it usually spreads very slowly, the disease is contagious to all classes of cattle. The mites live on the surface of the skin and produce lesions resembling those of common scab. The lesions are usually found on the tail or legs and generally remain localized. For practical purposes it is not necessary to distinguish between chorioptic and common scab, because the same treatment is recommended for both.

**DEMODECTIC MANGE**

Until about 1923 demodectic, or follicular, mange of cattle, caused by the mite called *Demodex bovis*, was not often recognized in the United States. Owing to the damage to leather caused by demodectic mange lesions, however, an investigation was made in 1927 to determine the extent of the disease, and numerous cases were reported from 14 States, most of which were in old cows of the dairy breeds. The lesions of demodectic mange in cattle appear as nodules, or small lumps, most often in the skin of the neck, shoulders, breast, and dewlap, and sometimes in other parts of the body. Demodectic mange may progress rapidly on an animal until the nodules appear nearly everywhere in the skin, or there may be no alteration in the number and size of the nodules during a period of several years. Ordinarily the disease does not spread rapidly from an infected animal to others in the herd, but precautions should be taken to prevent possible spread by isolating infected animals. There is no known practical remedy for demodectic mange in cattle, although frequent dippings delay the progress of the disease and may cure mild cases.