Mange in Equines

BY MARION IMES

NATURE, it seems, has ingeniously devised, for each kind of livestock, a set of mites that live at the expense of the host animals and their owners. Here is an account of the creatures that make horses mangy, and how to get rid of these tormenting pests.

Mange in Equines, also known as scabies, scab, or itch, includes a group of contagious skin diseases affecting horses, asses, and mules. Since for practical purposes the causes, symptoms, diagnosis, and treatment of mange in the three kinds of animals are similar, mange in horses is selected as typical of the disease in the group.

Mange is caused by small insectlike parasites known as mites which live on or in the skin of the host animal. Horses are commonly affected by three different genera of mange mites—Sarcoptes, Psoroptes, and Chorioptes—and each causes a different kind of mange, known as sarcoptic, psoroptic, and chorioptic, respectively.

Mange mites are truly parasitic, as their entire life cycles are passed on the host animal, and they are the sole cause of mange in equines. In obtaining their food from the tissues of the host and carrying on other life processes, the mites cause wounds or lesions in the skin. As each class of mites has distinctive habits, the nature and location of the lesions they cause in the early stages of mange are sufficiently characteristic to aid in making a differential diagnosis—that is, a diagnosis of the specific type of mange in a given case.

CONTAGIOUSNESS OF MANGE

Each species of domesticated animal has its own peculiar varieties of mange mites, and most of the mites from one species of animal cannot live and propagate permanently on a different species. The sarcoptic mites, however, are transmissible from one species of animal to another and some, including the sarcoptic mites of the

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horse, from animals to man. Ordinarily when one species of animal contracts the contagion from another species, the mites live only a limited time on the new host.

Mange is usually transmitted by direct contact with infected animals, but equipment used on or around infected animals or other objects in contact with them act as carriers from which the disease may be contracted. Although mange mites cannot complete their life cycles on the host animal, they may live as long as 2 months when dislodged in cool moist places, and the eggs may retain their vitality for about 4 weeks. Since various factors such as exposure to sunlight, dry air, and other conditions affect the longevity of mites and the viability of their eggs when separated from their host, it is not known definitely how long infected premises may remain a source of danger. Practical experience indicates that buildings and corrals are free from infection about 30 days after all infected animals have been removed.

The spread of mange from one animal to another is not limited to any one season of the year, although the mites are usually most active on the host animals during the winter months. The disease spreads rapidly among horses closely confined or crowded together. Animals exposed to sunlight on pasture seldom contract mange or show new lesions. If they are infected, however, the disease will become active under winter conditions.

Mange is very contagious to horses of all ages and classes, and precautions should be taken to prevent the introduction, spread, or harboring of the contagion. Untreated infected animals or objects used on or around such animals should not come in contact with horses free from the disease. If the disease occurs, all horses on the premises should be treated regardless of the number showing infection. All buildings and small inclosures occupied by infected horses and all equipment used on or around such horses, should be cleaned and disinfected. All litter should be removed from buildings and yards and the exposed surfaces should be sprayed with coal-tar-creosote dip or disinfectant (see Disinfection and Disinfectants, p. 179), diluted in accordance with the instructions on the container. Equipment which may carry the mites should be immersed in the disinfectant.

SARCOPTIC MANGE

The minute white or yellowish parasites that cause sarcoptic, or common, mange of horses are known technically as *Sarcoptes scabiei equi*. The full-grown female mite is about one-fiftieth of an inch and the male about one-sixtieth of an inch in length. They are barely visible to the naked eye but are plainly visible under an ordinary hand lens. The general form of the body is more nearly round than oval, and under a high-power microscope a number of short spines projecting backward may be seen on its upper surface. When mature, these mites have four pairs of short thick legs. The first and second pairs near the head extend beyond the margin of
the body, but the third and fourth pairs usually are not visible unless the mite is placed on its back or dorsal surface.

The sarcoptic mites penetrate the upper layer of skin and form burrows or galleries in which mating occurs and the eggs are laid. Each female forms a separate burrow and lays from 10 to 25 eggs. The eggs hatch in from 3 to 10 days, and the young mites after passing through several molts begin laying eggs in new burrows when they are 10 to 12 days old. The average period of incubation (from the time the eggs are laid until they hatch) is about 4 days, and the average period from hatching until egg laying begins is about 11 days. A new generation of mites, therefore, may be produced in about 15 days.

The first visible symptoms of sarcoptic mange in horses are the signs the animal manifests of an intense localized itching. The burrows formed by the mites usually extend to the sensitive layer of the skin, and the presence and activities of the parasites in the tissues cause irritation, inflammation, and swelling. Vesicles (blisters) and small nodules, or lumps, are formed in the skin over and around the burrows. The vesicles break and discharge serum which may dry into scales or granules.

The disease may start on any part of the body, but usually the first lesions appear on the neck, shoulders, or head. From these parts they spread until the entire body may become involved. As the disease advances the nodules become closer together, the hair over the lesions stands erect, and some of it drops out. The skin becomes swollen, thick, and dense to the touch and is drawn into wrinkles or folds. The mechanical injury to the skin from rubbing and biting causes large scabs to form. When the mites are not very active the skin may have a dry, leatherlike appearance.

The only certain method of diagnosis is to demonstrate the presence of the mite. If the lesions are moist, the mites can usually be found in scrapings taken from the edge of a fresh lesion or the furrows of the wrinkles. As sarcoptic mites live in the skin and not on the surface, it is necessary to scrape down to the second or sensitive layer of skin to obtain them. When the lesions are dry and the skin has a leatherlike appearance, it is difficult to find the mites.

**PSOROPTIC MANGE**

The mites, called *Psoroptes communis equi*, which cause psoroptic mange in horses are slightly larger than sarcoptic mites. They are visible to the naked eye, especially when they are placed against a dark background. The general form of the body is oval, and the tapering head is longer than it is broad. When mature, the mites have four pairs of legs, all extending beyond the margin of the body.

The psoroptic mites do not form burrows but live in colonies on the surface of the skin. Each female may deposit as many as 24 eggs, which hatch on the animal in 4 to 7 days. The new generation of mites reach maturity and mate, and the females deposit eggs in from 10 to 12 days from the time of hatching. These stages in
the life cycle have an important bearing on the interval between treatments.

Psoroptic mange is more contagious and usually spreads more rapidly than the sarcoptic variety. The disease usually starts on those parts of the body covered thickly by hair. In obtaining their food the mites puncture the skin of the host animal and probably introduce a poisonous secretion into the wound. As the mites increase, many small wounds are made, causing intense itching, inflammation, formation of vesicles, and exudation of serum. The serum on the surface of the lesion becomes mixed with foreign matter, including micro-organisms, and the mass soon hardens into small yellowish or gray-colored scabs. As the scabs form, the mites move to and feed on the healthy skin around the edges of the lesion, and thus the scab-covered wound is gradually enlarged. The scabs may become dark-colored from blood stains and other causes.

Some of the mites move to other parts of the body and form new lesions, and the process is continued until the entire body surface may become involved. As the disease advances, increasingly large areas of skin become denuded of hair and covered with adherent crusts or scabs. The areas of affected skin become thickened and hardened, or else swollen. The severe itching causes the infected animals to rub, bite, or scratch themselves, so that the scabs are often broken and some of them are torn loose, leaving bleeding wounds. Animals with advanced cases of mange become weak and emaciated, and unless relieved by proper treatment, many of them die.

Psoroptic mites may be seen on the skin, but to demonstrate the presence of the mites it is usually necessary to scrape the outer edges of a red moist lesion with a dull knife blade and transfer the scrapings to a smooth black surface, such as a piece of black paper or a painted board. 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. They are quite plainly visible under a low-power hand lens.

**CHORIOPTIC MANGE**

Chorioptic mange, commonly known as foot or tail mange, is a contagious skin disease caused by mites called *Chorioptes equi*, which closely resemble those of the psoroptic species. The chorioptic mites live on the surface of the skin and cause lesions similar to those of psoroptic mange. One characteristic difference is the location of the lesions, which are usually confined to the lower parts of the limbs or tail, though they may spread over the legs and even the abdomen.

For practical purposes it is not necessary to differentiate between chorioptic and psoroptic mange, as the treatment is the same for both diseases. If the lesions are confined to the lower parts of the limbs, wading tanks instead of dipping vats may be used in treatment.

**TREATMENT OF MANGE**

In treating horses, asses, and mules for mange the primary purpose is to kill the parasites that cause the disease. As mange mites
may be on any or all parts of the skin of infected animals, eradication usually can be effected only by applying medication over the entire surface of the skin. Hand application of suitable remedies delays the spread of mange, but on account of the difficulty of applying treatment by hand over the entire body surface, the method cannot be depended upon to eradicate the disease. Hand applications are of value, however, in connection with spraying or dipping. Lesions that are covered by hard scabs or crusts should be well soaked by hand with warm dip just before the animals are dipped or sprayed.

Dipping, which consists in immersing animals in a medicated liquid that will kill mange mites, is the most effective and dependable method of treating equines for mange. A dipping vat with attached draining pens, corrals, and other necessary structures is commonly called a dipping plant. Dipping plants are usually so arranged that animals enter one end of a vat filled with dip, swim through the liquid, and leave the vat at the opposite end. Cattle-dipping plants are suitable for dipping horses.

In dipping horses the depth of the liquid in the vat is usually maintained at from 70 to 80 inches, or deep enough to swim the tallest animal. Horses carry out of the vat and retain from 2 to 4 quarts of dip each, depending on their size and the condition of their hair. The total estimated quantity to be carried out by the animals to be dipped, plus that required to charge the vat, should equal the total quantity required to complete the dipping if none is lost by leakage or otherwise wasted.

The capacity of the vat is usually obtained by multiplying the average length in inches by the average width, and then multiplying the product by the depth from the dip line to the bottom, measured at the center of the vat. This gives approximately the number of cubic inches of space to be filled with dip. Divide this by 231 (the number of cubic inches in a gallon) and the result will be the number of gallons of dip needed to charge the vat. To obtain the average length and width of a vat with sloping sides, add the measurement at the bottom to that at the dip line and divide by 2.

After the vat is charged, the contents should be well stirred so that the dip may be of uniform strength and temperature throughout. While the animals are in the vat, the head of each one should be submerged or ducked twice for an instant, and if the inner surfaces of the ears are not well soaked they should be hand-treated. Mangy horses are usually held in the dip for 2 to 3 minutes.

When only a few horses are to be treated and a dipping vat is not available, the dip can be applied in the form of a spray. This method is not economical but if the spraying is continued until the entire surface of the skin is well soaked, mange can be eradicated in this way. An orchard spraying outfit or an ordinary hand spray pump is suitable for the purpose.

Two dippings 10 to 12 days apart usually effect eradication of psoroptic and chorioptic mange. The first dipping, if properly done, kills all the mites but does not destroy the eggs. The second dipping,
if timed correctly, kills the new generation of mites before they start laying eggs.

Sarcoptic mites are more difficult to eradicate. One dipping usually does not kill all the mites, probably because the dip does not always reach the bottom of all their burrows and come in contact with all of them. The proper interval between dippings for sarcoptic mange is 6 or 7 days, and four or more dippings or treatments are usually necessary to eradicate the disease in ordinary cases. Old chronic cases which have continued for several years are practically incurable, and animals so infested should be isolated or slaughtered.

Two classes of dips commonly and successfully used are lime-sulfur and nicotine. Both are used warm for dipping horses; the temperature of the dip in the vat is usually maintained at $90^\circ$ to $95^\circ$ F. while in use. Prepared dips should be diluted or mixed and used in accordance with the instructions on the label of the container.

Proprietary brands of lime-sulfur are available either as a concentrated liquid, known as liquid lime-sulfur, or as powder or crystals, known as dry lime-sulfur. These products are equal to or even better than the home-made lime-sulfur dip.  

The nicotine dips sold under various trade names are effective remedies for mange when diluted with water so that the dip contains not less than 0.05 percent nicotine. If used much stronger, they are likely to injure horses, especially if the animals are warm from exercise or hot weather, or if very hard water is used in diluting the dip. Nicotine dips should not be heated above $110^\circ$ F.

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