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M R. Gardiner

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HORSE PROBLEMS IN THE KIMBERLEYS

A review of current horse disease and ill-thrift problems in the Kimberley region of Western Australia, with emphasis on the "Kimberley horse disease".

By M. R. GARDINER, B.S., V.M.D., Chief Veterinary Pathologist

DISEASES and other conditions affecting the health and working capacity of the horse have long had an important bearing on the economy of the cattle and sheep industries of the northern part of Western Australia. Under present conditions it is impossible to muster stock on the large pastoral leases in the Kimberley districts without the aid of horses, and many other operations would be more difficult if stockmen were denied their services.

Many attempts have been made to assess the magnitude of horse losses in the Kimberleys and to establish their causes. Although the extent of loss in the horse plant on individual stations can be fairly well estimated when the horses are mustered after the "wet," it has usually been impossible to determine the fate of many of those animals which fail to turn up.

Occasionally horses are seen with the typical signs of "walk-about"—the so-called Kimberley horse disease—and other obvious causes of disease are recognised from time to time. However, in the absence of routine post-mortem examination of horses and the study of suitable specimens by a pathologist—both seldom undertaken under present conditions—the precise cause of death or the relative importance of various disease factors cannot often be ascertained. This state of affairs has led to endless speculations among station managers, stockmen and others concerned, about the causes of ill-health and death of horses in this area.

KIMBERLEY HORSE DISEASE

There is a tendency to assign horse losses to Kimberley horse disease regardless of whether or not the typical and usually unmistakable signs of "walk-about" are seen. Although there is mounting evidence that certain of these losses may be due to other causes it is likely that most horse losses in the Kimberleys are in fact due to this disease.
A horse suffering from Kimberley horse disease. It is likely that most horse losses in the Kimberleys are due to this disease.

**Cause**

There are still apparently some who ascribe Kimberley horse disease (or "walk-about") to an infectious agent in spite of studies in Australia that have shown conclusively that a poison plant is responsible.

A great deal of work has been done in Australia and overseas on this type of plant poisoning in horses as well as in other domestic animals. As a result we know that at least three genera of plants may be incriminated in various parts of the world. Various species of *Senecio*, *Heliotropium* and *Crotalaria* have been shown to produce the signs and symptoms identical to those that characterise Kimberley horse disease and to cause the characteristic liver damage that is the pathological evidence of the disease. This disease syndrome has been given different names in the different countries where it occurs; these include South Africa, New Zealand, Canada, U.S.A., Germany and Great Britain. In all of these countries, the same aimless walking, head pressing and disturbed consciousness that so readily identify the disease, have been described.

All of these plants produce closely related chemical substances that differ only in degree in their ability to damage the liver. The action of these chemical substances is principally on the liver and it appears to be irreversible.

It is important to understand the fact that the liver damage from this class of chemicals is cumulative; that is, every encounter with the toxic plant is registered on the liver adding its quota of damage until a degree of injury has been reached which results in the death of the animal. Thus a lethal accumulation of liver damage may be reached in a few days or weeks, or be deferred for several years.

This fact helps to explain horse losses in paddocks that contain no poison plants; the fundamental damage would have occurred elsewhere with some other cause bringing about the death of a weakened and partially liver-damaged horse.

**"Rattlepod"**

In the Kimberleys, *Crotalaria retusa* or "rattlepod" was shown a few years ago to cause "walk-about" and was, until recently, considered to be the only factor. This toxic plant grows along the river frontages and the banks of creeks that have been subjected to flooding. It can be extremely prevalent in these locations after a normal "wet" but in dry years little or no "rattlepod" may be seen.

**Another Species**

In 1959, it became evident that cases of "walk-about" might occur in country where *C. retusa* was absent and it was suggested that another crotalaria species...
A stand of Crotalaria crispata. This species is common on sandy soils associated with spinifex and shrubby plants. It appears to be favoured by overgrazing.

Horse paddocks should be sited away from this plant.

could be involved. The most probable one was thought to be Crotalaria crispata and consequently this plant was thoroughly investigated.

The Government Botanist has described Crotalaria crispata as a much branched annual shrub, rarely exceeding 12 in. in height with woody, loosely hairy stems, greyish-green hairy leaves \( \frac{3}{4} \) to 1 in. long, and yellowish-brown flowers. It grows abundantly in the valleys of the Ord and Fitzroy Rivers and their tributaries, on the low sand hills away from the river frontages. "Crispata" reaches its greatest development in the Acacia—Bauhinia sandy soils, associated with spinifex and shrubby plants.

Chemical work on "crispata" by the C.S.I.R.O. Chemical Research Laboratories, Melbourne, and extensive feeding trials at the Animal Health Laboratory, South Perth, have indicated that not only does "crispata" contain one of the toxic alkaloids found in "retusa" (monocrotaline) but, it also contains two other related alkaloids. One of these is roughly twice as toxic as the "retusa" alkaloid.

In these ways, it has been shown that "crispata" is a more toxic plant than "retusa" and it only remains to investigate the circumstances under which the plant is consumed.

South African workers, many years ago described a lung disease in horses, which they called "jaagsiekte" and successfully reproduced the disease by feeding a species of crotalaria (C. dura) found in that country. It was, therefore, with considerable interest that a lung condition similar to "jaagsiekte" was found in several Kimberley horses known or strongly suspected to have eaten Crotalaria crispata. This observation has been confirmed in animal feeding trials. Study of some of these horse lungs has shown widespread destruction of tissue and replacement by connective tissue. It is probable that this chronic lung damage may cause serious impairment of the vital respiratory capacity of working horses in the Kimberleys.

Careful investigation gives one the distinct impression that C. retusa or "rattlepod" is not ordinarily eaten by stock, although it is said to be palatable in the early growth stages. Few stockmen report having seen horses eat it. On the other hand, it has been assumed that "crispata" is not eaten and is unpalatable. This author has seen "crispata" spread extensively over wide areas of overgrazed land carrying mainly spinifex and other poor grasses such as wind grass and mulla-mulla. The "crispata" at least in the young green stages, gives an appearance of succulence and palatability superior to the other available plant species. With attention focussed on "crispata" as a toxic plant as a result of...
Crotalaria crispata, which has now been found to be more toxic than C. retusa ("rattle-pod") and is now considered to be as important as this plant as a cause of Kimberley horse disease. The work described above, horses have been observed to consume the plant. At present "crispata" must rank in importance with "retusa" as a cause of Kimberley horse disease. It could well turn out that, because of its greater distribution and inherent toxicity, "crispata" is the more important of the two Crotalaria species incriminated in this disease.

Several species of Heliotrope grow extensively in the areas inhabited by "crispata" and because of their botanical relationship to the known toxic plant, Heliotropium europaeum (which causes a similar liver disease in Eastern States sheep), suspicion has been attached to them as other possible causes of "walk-about." Field and other evidence however, gives no support whatsoever to this suspicion and we must at this time regard the Kimberley heliotropes as essentially non-toxic. The same may be said for another species of Crotalaria, C. trifoliastrum, which, although extremely widespread, appears to be nontoxic. Two further Crotalaria species—C. novae-hollandiae and C. verrucosa have also been suspected of being toxic. Investigations are being continued in order to determine the true position of these plants in the Kimberley horse disease problem.

Prevention

There is little doubt that C. crispata has the characteristics of an invader plant and may increase in distribution and density if the current trend towards overgrazing the land continues. It has been noticed that well grassed, understocked country contains little or no "crispata.

On one station which has had heavy losses from "walk-about" in recent years, a horse paddock having no visible poison plants and with a minimum of sandhill country likely to carry "crispata," was established on country away from the river frontages. No "walk-about" losses have occurred since then and it is felt that this procedure is the only practical answer to the problem. Every station with a history of "walk-about" should build such a horse paddock. Managers may be assured that if they can keep their horses away from C. retusa and C. crispata Kimberley horse disease cannot occur. It is also important that these paddocks should be reserved entirely for horses and not concurrently grazed by cattle or sheep with possible consequent eating out of good feed, overgrazing and invasion by poison plants.

Most cases of "walk-about" show the aimless wanderings and crashing into obstacles well known to Kimberley stockmen but some definite cases do not exhibit these signs. These show a wasting type of disease and stand around with a dejected head-down posture. It is probable that the walking symptom is a fairly common terminal event and that early signs such as loss in condition may not be recognised as toxic in origin.
This author believes that many horses in the Kimberleys have some degree of liver damage which can affect their capacity for work but has not reached a stage of recognition as definite disease, and that elimination of these toxic plants would often result in a noticeable improvement in the performance of a horse plant. It is further contended that these minor degrees of liver damage predispose to the adverse effects produced by the conditions mentioned below, exacerbating them and giving rise to earlier ill-health and death than would otherwise happen.

PARASITISM

Observation made on horses have definitely shown that worm parasites in Kimberley working horses may be a very important cause of ill-thrift in a horse plant.

Both stomach and small intestinal species of worms occur and may reach enormous numbers. Horses carrying heavy burdens of parasites utilise feed poorly, have depressed appetite and lose condition even if not worked. If these horses are worked, all of these effects are greatly increased and the animals fail to meet the requirements of even the lightest work; such horses tire easily and lose weight rapidly.

The tropical Kimberley districts are ideal during the “wet” for the survival and spread of worms. The dispersion of horses over wide areas of country in the “wet” probably prevents much transmission of parasites and this, along with better nutrition at this time, no doubt results in low worm infestations until mustering after the “wet.” From this time on until complete drying off of the pasture in July or August, environmental conditions are ideal for parasite transmission, particularly if horses are maintained on damp ground or around billabongs.

There is no reason why the working horse plant should be deprived of the great benefits of modern worm treatments. The best of these is the new drug Thiabendazole which is almost completely effective against all forms of the common parasites of the horse and which is essentially non-toxic.

Station managers are emphatically urged to drench, or to administer this drug on two or three occasions in the feed of horses brought in after the “wet.” Tremendous benefits may be expected at low cost if this is done. Drenching of brood mares and mares with foals at foot will also pay significant dividends. It should be also be realised that the commonly used worm drug phenothiazine is to some extent toxic to horses, particularly those animals suffering from the effects of liver damage induced by crotalaria species.

SALT DEFICIENCY

All classes of livestock need salt for normal growth and maintenance but none more so than the working horse, which loses great quantities of salt in the sweat, especially under the hot and often humid conditions existing in the Kimberleys.

It is estimated that the average requirement of the horse is about 2 oz. (60 grams) of salt per day. With heavy work and profuse sweating, this requirement may be more than doubled. Salt deficient horses suffer loss of appetite, weight and condition and develop a rough coat. They eventually lose the ability to sweat and to regulate heat loss with serious consequences on general health and working ability. Part of the salt requirement is met from the drinking water which, in Kimberley bores, may vary widely from 10 grains to more than 1,000 grains per gallon. There is an absolute deficiency of salt if the bore water contains less than 150 to 200 grains per gallon, levels which occur in more than one-third of stock waters in this area.

To avoid salt deficiency, loose salt should be available at all times to working horses on Kimberley stations. This will be consumed as required.

MALNUTRITION

Natural feed is generally insufficient to maintain working horses in the Kimberleys and some supplementary feeding must be provided, preferably oaten grain along with a little bran.

This need should be obvious to all stockmen but it is surprising how many have the impression that natural paddock feed, with all its inherent deficiencies in
this region, can provide enough protein and energy for the hard-working Kimberley stock horse.

OTHER CONDITIONS

Lack of attention to the details of horse husbandry contributes significantly to horse losses in the Kimberleys. Conditions affecting the eyes, mouth and feet are commonplace in these horses.

The prevalence of flies predisposes to the transmission of eye infections and constant attention must be given to their prevention and cure with readily available antibiotic drugs. Injuries to the eye appear to be not uncommon and may be treated to great advantage by a combination of antibiotics and cortisone preparations.

A horse is no better than his feet and attention to hoof hygiene will bring a considerable harvest in improved performance.

Little is known concerning the condition of the mouths of Kimberley horses but the established principles of equine dentistry must apply to horses here as elsewhere and various tooth abnormalities that prevent proper prehension and mastication of feed should be looked for and corrected.

Saddle sores and other wounds sustained in the performance of working duties are often neglected and are important in the ultimate deterioration of an animal's value and health. Most of these are preventable and certainly treatable by modern methods. It has occurred many times to the writer, that a valuable contribution to the working efficiency of a horse plant would be a stockman especially versed in the management of these many details of equine care, and whose main job would be to deal with them as they arise and to institute such preventive measures as conditions make feasible.

CONCLUSIONS

The working horse is an essential for successful cattle and sheep enterprises in the Kimberley region of Western Australia. All too often it is neglected. The attitudes which give high priority to the maintenance and efficiency of tractors, trucks, and other mechanical equipment do not, as a rule, apply to the horse. It is remarkable that the Kimberley horse is often expected to live on a combined ration of poor quality feed and toxic plants, while being worked desperately hard without attention to the time-honoured principles of horse husbandry, depleted of vitally essential salt, and heavily parasitised.

The horse plant should be given the attention it deserves as an important economic element of the cattle industry of the North. It is the author's contention that the following would give immeasurable benefits:—

1. Increase in stock plant numbers so that more frequent spelling could be practised.
2. Elimination of Kimberley horse disease by the isolation of horses from areas containing Crotalaria retusa and Crotalaria crispata; adequate fencing is thus essential.
3. Control of internal parasitism by the use of an efficient worm drench at strategic intervals.
4. Supplementary feeding during the working season.
5. Special attention to the many largely preventable and treatable conditions, such as eye, mouth and foot troubles, and including wounds and other injuries. Great benefits could result from the training of stockmen in these matters and from the sympathetic attention of station managers.

Acknowledgments

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