Avoid losses from poison plants

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Avoid Losses from . . .

POISON PLANTS

Farmers in “Poison” districts can avoid serious stock losses if they can recognise dangerous poison plants, and have a knowledge of how the concentrations of toxic substances in these plants change with the seasons.

In this article, R. D. Royce, Officer in Charge of the Botany Branch, outlines the principles involved.

EVERY country in the world has its poisonous plant problems, but in Western Australia we have more than our share.

Few agricultural districts are free of these dangerous plants, and some districts are so well supplied that their development has been considerably retarded. Today however, a number of these areas are being opened up for settlement, so that the problem of the poisonous plant is just as pressing as it ever was.

Toxic species are to be found in most plant families, from the algae to the daisies, and it is understandable therefore, that it is not possible to recognise all toxic plants by one or even by a series of physical characters. Even the great plant families themselves are hard enough to differentiate, and plants from a number of families have little in common.

RECOGNITION

In the South-West of Western Australia, the great majority of the native toxic species are members of the pea-flowered group of the legumes. All have flowers which are structurally the same as the field pea, tree lucerne or the clovers. The size and colour of the flowers differ, but they are always unmistakably pea-shaped.

Most of these are species of either Gastrolobium or Oxylobium. Plants such as York Road and Champion Bay poisons are species of Gastrolobium, while box, granite and net-leaved poisons are included in the genus Oxylobium.

These plants are closely related and therefore have quite a number of botanical characters in common. Thus in the flowering season it is comparatively easy to arrive at a fairly reliable decision on the possible toxicity of any pea-flowered plant.

At other times of the year, however, it is not nearly so easy and a number of dangerous species cannot always be distinguished from plants which are completely harmless.

Flower Arrangement:

The most important of these characters is the arrangement of the flowers on their stems.

In all toxic plants the flowers are borne on special leafless branchlets and not on the main stem. These branchlets may be produced at the apex of the leafy stem so that the flowers are carried beyond the leaves, or they may arise from the angle between the leaves and the stem. In either case there are no leaves on the branchlets, and after flowering and the shedding of the seed the branchlet itself dries up and falls from the stem.

In non-toxic plants on the other hand, the flowers are borne on the main leafy
stems and the stalk of each individual flower arises from the stem at the point where a leaf has already developed. Thus the flowers are not on a special branchlet but are amongst the leaves and arise from the main branches.

Leaf Arrangement:
Leaf arrangement is also important, and this is one of the best known characteristics of toxic species.

The leaves are either opposite, as in the majority of species, or in threes, as in such plants as sandplain poison, while in river poison they are in clusters of four. This statement is correct for the great majority of plants, but in some species, as for example box poison, the leaves may be scattered along the stem and not arranged in any particular order. Again in Phillips River poison, the leaves are so crowded together that no grouping is apparent.

Stipules:
The third and probably the most difficult character to observe is the presence of stipules at the base of the leaves. These stipules are small structures arising from the stem at each side of the point of union of the leaf stalk with the stem. They may be fine and hairlike as in Champion Bay poison and in the majority of the other species, broad and flat as in gilbernine poison or stout and spinescent as in York Road poison. They sometimes fall off as...
the leaf matures, but in all toxic species they can be seen towards the apex of the stem among the young leaves.

These three characteristics, then, serve to identify a toxic species among the native pea-flowered plants, and from the practical point of view a knowledge of them is most important.

Where sheep are being lost, or better still before sheep are turned in to graze, the paddock should be closely inspected, and if any plants having flowers on special leafless branchlets, with opposite leaves and stipules, are to be found in the area, specimens of these should be forwarded for identification to the Botany Branch, Department of Agriculture, South Perth.

**VARIATIONS IN TOXICITY OF POISON PLANTS**

**Toxic Plants** fall into two groups—those which are toxic only under certain conditions, and those which are always toxic.

The first type, examples of which are plants which produce prussic acid, are dangerous only under certain circumstances, and as a rule, only for short periods. At other times these plants are harmless and are even regarded as good pasture or fodder species. They are not usually of great significance as poisonous plants, but when stock losses do occur, they may be both sudden and severe.

The second group consists of those plants in which a toxic principle is constantly present in the plant tissues, and the plants are therefore always dangerous. To this group belong all the really serious toxic species, including the many *Oxylobium* and *Gastrolobium*, of this State. These are of tremendous economic importance to farmers and graziers in nearly all the agricultural and pastoral areas of the State, and particularly in those areas where new land is being opened up.

In Western Australia the term “poisonous plant” tends to be synonymous, in popular usage, with the many pea-flowered species of *Gastrolobium* and *Oxylobium* such as York Road poison, box poison and many others. These plants have been responsible for very serious stock losses, and although deaths are known to have occurred at all seasons of the year, they are more numerous in the spring and early summer than at other times.

This has lead to the recognition of the fact that there is a certain variation in the concentration of the toxic substance in the plant tissues. It has been found that there are three levels of toxicity in these plants.

**Late Summer**

The first and the least toxic stage is during the late summer and early autumn months. Plant growth at that time is stagnant, the leaves are harsh and dry, and the plants are relatively unpalatable. Nevertheless they are still toxic and if eaten in sufficient quantity can cause losses.

**New Growth**

With the advent of growing conditions in late autumn the toxic plants, in common with many other species both native and introduced, put out fresh shoots. In most cases these are soft succulent growths and are quite attractive to stock. As a
result of the activity within the plants in producing the new growth, the toxic principle in the tissues increases, so that the new season's shoots are both more palatable and more toxic. Similarly young seedling growth is usually more dangerous than the over-summering leaves. This is the second level of toxicity.

Flowering Stage

Growth continues during the late winter and spring months until the flowering. Meanwhile, the build up in the toxic principle runs parallel with plant growth, and reaches its peak at the stage of full flowering. Thus in September and October the plants have reached both their most palatable stage and their most toxic stage. At this time they are capable of causing very heavy losses, and it is fortunate that at this season they are also most easily recognised. During the setting of seed after the flowers have faded the toxicity remains high, and it is only after the dispersal of the seeds in December, that the third and most dangerous level of toxicity gives way rather rapidly to the less dangerous summer resting stage.

The plants have then gone through a complete cycle of toxicity, and the variations exhibited throughout the year are of considerable practical importance. The summer period is regarded by many farmers as being relatively safe for grazing bush paddocks containing a little poison, particularly such relatively harmless species as prickly poison. But even here grave danger can exist, and the cause of it is the summer thunderstorm.

Summer Thunderstorms

The sudden and plentiful supply of moisture in the soil produces a rapid and phenomenal increase in the toxic substance, so that within the space of a few hours the plants become as dangerous as during the flowering period. Even prickly poison under these conditions becomes as toxic as the other species, and has been known to cause very heavy losses.

Toxic plants serve no useful purpose on a farming property and should be eradicated. But while the eradication programme is being carried out, poison country should be handled with care, and stock should not be grazed in paddocks containing toxic species during the flowering season, while in the summer period, if a thunderstorm appears to be imminent stock should be immediately moved into a safe paddock.

—from an A.B.C. Radio Series

ARREST THOSE SPARKS

Fires started by sparks from faulty spark arresters on tractors during wheat harvesting can cause heavy crop, pasture and stock losses.

"It is essential to fit an approved spark arrester," says Agricultural Engineer of the N.S.W. Department of Agriculture, Mr. J. G. Drever. Spark arresters work under conditions of great heat, take a lot of pounding and are subjected to much vibration.

All these factors make design and manufacture difficult, and cause the arrester to wear or break down, sometimes with serious economic results.

"Do not take chances with your spark arrester. It is not sufficient to know that when it was first fitted it was an approved type. "Check it regularly to make sure it is still serviceable," advised Mr. Drever. The Australian Tractor Testing Station conducts tests on spark arresters. Reports on these tests give a brief specification, show how they work, how constructed materials used, and analysis of the effectiveness of spark arresting and some comments on factors influencing their prospective life.

Test reports appear from time to time in the Journal of Agriculture.