Poison plant problems

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A POISON plant may be defined as a plant which, when eaten by humans or animals, exerts harmful effects or causes death by virtue of its toxic substances.

The definition is quite clear, and the effects of a great many poison plants are indeed just that. If stock eat enough of the poison plant they become sick or they die.

Examples of highly toxic poisonous plants are the toxic species of Oxalobium and Gastrolobium, Cape Tulip and the Thornapples.

With a large number of other plant species, however, the definition can only be accepted with certain reservations. Toxic manifestations caused by these plants may be sporadic or rare, and often there is nothing to suggest that the plants are toxic at all.

Poison plants, unlike metallic or organic poisons are extremely variable in their reactions, and often complex in their mode of action. Their nature is determined by several inter-acting factors, and their toxic substances may appear only under specific sets of conditions.

Some of the factors that have a bearing on the toxicity of species are:
- Heredity.
- Soil moisture relationship.
- Temperature.
- Light.
- Age of plant.
- Soil type.

Heredity as a factor in determining the toxic levels of plants is shown by Subterranean clover; some strains contain higher levels of oestrogenic substances than others.

Different varieties of sudan grass and soursob have also been shown to contain different amounts of toxic material. This explains why certain poison plant species are more toxic in different localities or why sometimes plants growing next to one another have different toxicity levels.

Soil moisture relationship must also be considered in poison plant investigations. Toxic principles within a plant are not always fixed in any one part of the plant, but may be translocated by sap flow. Favourable soil-moisture conditions usually favour toxicity since there is a flush of new growth or a rise in sap. The role that toxic principles play in the metabolism of a plant and the translocation of these toxic materials is governed by the physiology of the plant. This plays an important part in determining the varied patterns of toxicity within the plant itself.

Temperature, light and age of the plant also affect the physiology of the plant. Each has an important bearing on the rate of transpiration and the rate of photosynthesis. These in turn determine the overall toxicity or distribution of toxic material within the plant.

Soil type can be significant in determining whether a plant is toxic or not. It is usually considered that better class soils favour toxicity and there is a thought that alkaloid-producing plants are usually associated with soils having a favourable nitrogen status.

Selenium toxicity is associated with soils in which this element is available to certain plants.

Toxicity in plants capable of producing prussic acid is quite complex. Here the
prussic acid is held as a harmless substance (called a glycoside) by a sugar molecule. It is released in the presence of a key substance, an enzyme, which is found only at certain times, either in the plant itself or in some other plant. Poisoning by prussic acid producing plants is therefore sporadic. Until all the factors governing the release of prussic acid are known, it is extremely hard to predict when such plants become toxic.

**Palatability**

The palatability of a plant known to be toxic can also be used to determine whether it is harmful or not. Palatability however can change from season to season or according to how hungry stock are. Heavy losses may sometimes result from stock eating harmful quantities of poison plants which they do not usually touch.

**Plant-Fungi Association**

There are some plants in which the toxic principle is not produced by the plant itself but by fungi associated with the plant. Ergotism and facial eczema are two notable manifestations due to this association. The plant acts as the vehicle for the ingestion of the toxic principle and should therefore be incriminated with the fungus as the cause.

**Farmers Can Help**

There is still much to be learnt about the causes underlying the toxicity of poison plants.

Farmers who lose stock in mysterious circumstances and suspect a poison plant are therefore urged to write immediately to the Department of Agriculture. They should set out the circumstances of the losses and submit specimens of plants they suspect are the cause.
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