

HERBICIDES FOR THE CONTROL OF HARRISIA CACTUS

G.J. Harvey and A. Tomley
Department of Lands, Queensland

Harrisia cactus, (*Eriocereus martinii*, Lab. Ricc.), is a potentially dangerous weed in Queensland. It is declared noxious, and grows mostly in or close to the Brigalow belt.

Though readily propagated by stem and tuber sections, its wide distribution is attributed to prolific seed production.

Early experiments involved arsenic pentoxide, some borates and chlorates. Consequently arsenic pentoxide was used in the control programme at Collinsville from 1951 to 1962. Seven to ten applications of 600 to 800 lb of arsenic pentoxide per acre, (672 kg to 896 kg per hectare) were required to control the plant. Disadvantages of such a control are obvious.

A mixture of 10.0% ^w/_w arsenic pentoxide plus 10.0% ^w/_w sodium chlorate kills 90% of plants treated. This mixture, being poisonous and highly corrosive, was never put to field use.

Cacodylic acid, M.S.M.A., and D.S.M.A., give mediocre results. As stem sprays, none are effective. Stem infections of cacodylic acid or M.S.M.A. give 100% kills. The activity of organic arsenicals appears enhanced by the addition of sodium chlorate.

Potassium hexafluoroarsenate (KAsF₆) appears encouraging. Rates of 4 to 8 lb per acre (4.48 to 8.96 kg per hectare), give low total kills, but severely retard regrowth, 80 lb per acre (89.6 kgm per hectare) gives 92% kill. Field observations show that it can be spread by surface water, and residue studies seem necessary.

Armitrole T replaced arsenic pentoxide at Collinsville in 1962. Applied as a 1.0% ^w/_v amitrole and 1.0% ^w/_v ammonium thiocyanate it kills all small vigorous plants and inhibits regrowth of other plants for 2 years. Neither component is effective alone. Amitrole T requires temperatures in excess of 90° F, (32° C), adequate soil moisture, and is most active on plants with tuber systems less than 8 in. (20.32 cm) deep. Because of this field applications were disappointing. It is corrosive, and was not readily accepted by landholders owing to its slow rate of activity.

Stem sprays of picloram give good results at 8 lb per acre (8.96 kg per hectare), lower rates being non-effective. Picloram and picloram/2,4,5-TP both as the potassium salt are the most active forms, while the iso-octyl ester in lighting kerosene is disappointing. Injections of 2 cc 1.0% ^w/_v picloram/4.0% ^w/_v 2,4-D reliably kill plants, this method finding limited

use for control of scattered plants.

Stem applications of 2,4-D and 2,4,5-T result in little more than corking of the epidermis. Application of 2,4-D (sodium salt) to cut tuber surfaces gives complete kills and is also effective as a soil surface application. Sodium 2,4-D is used for scattered plant control.

Of the stem sprays tested, 2,4,5-TP as the butyl and isobutyl ester is best. Applied as a 1.0% a.e. emulsion at the rate of 16-32 lb. per acre (17.92-35.84 kg. per hectare) it gives average total kills of 62%, and is effective over a wide range of seasonal conditions on all types of *Harrisia* growth.

Glasshouse trials show 2,4,4-TP is absorbed by roots and high percentage kills in the field may be attributed to the technique of spraying the soil at the plant bases as well as the stems.

Absorption and activity may be linked with the pH of spray solutions. Esters of 2,4,5-TP, (P.H. 2.9), are highly active, while the amine salt, (P.H. 9.5), is almost inactive.

From the studies of emulsifiable acid, amine, and ester formulations of 2,4-D, 2,4-DP, 2,4,5-T, 2,4,5-TP, and MCP, it appears the propionic acid group is most effective. Absorption rate of the butyl and isobutyl ester formulation of 2,4,5-TP is increased by solubilizing with 4.0% v/v of a commercial non-ionic surfactant, but rate of stem kill is not increased.

During the financial years 1967/1968 and 1968/1969, 15,000 gals. of butyl ester 2,4,5-TP were used to treat *Harrisia cactus* in Queensland.

2,4,5-TP has gained wide acceptance by landholders, who are pleased with its rapid rate of kill and lack of mammalian toxicity. It has little effect on spraying equipment.

THE DISTRIBUTION AND CONTROL OF SILVER-LEAFED NIGHTSHADE
(*SOLANUM ELAEAGNIFOLIUM*) IN SOUTH AUSTRALIA

M. J. Catt
Department of Agriculture, South Australia

Silver-leafed nightshade (*Solanum elaeagnifolium*), known also as tomato weed or white-horse nettle, has been present in South Australia for about 25 years. It was not recognized as being different from several native *Solanum* spp. until 1958. Characteristics of the weed and identification features have been recorded by Tideman (1960).