

Pre-emergence Weed Control in Sugar Cane Areas

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In the spring of 1949 pre-emergence weed control trials were set out in many of the sugar producing areas of Queensland. These cane growing districts occupy a narrow coastal strip running from 16° to 30° south latitude. All areas are characterised by summer monsoonal rainfall, the annual precipitation varying from 40 inches in the south to 200 inches in the wet tropical north. There is a general tendency towards dry conditions in the spring months. The majority of cane farms are not irrigated. Weed and grass growth is prolific in all areas and must be kept under strict control. It is possible to do this reasonably efficiently and economically with mechanical equipment. The rubber tyred, high clearance light tractor is valuable in this respect and moreover cultivation to control weeds is frequently combined with some other essential row operation.

However the results of the preliminary trials indicated that a very effective control could be obtained by a pre-emergence application of the sodium salt of 2,4-D. The duration of the effect varied but under average conditions germination was prevented for periods of 1½ to 2½ months. In one instance complete control was recorded for 21 weeks in late spring and summer, during which time some 20 inches of rain fell. Although such extended periods as this latter instance are not common a very worthwhile depression of germination is normally achieved when the spray is properly applied. Sometimes a few weeds and grasses may commence to grow but their growth is abnormal with a poor root system, and no appreciable competition is presented to the cane.

The application is more effective on soils in good physical condition. On soils which set hard and crack open breakdown of the pre-emergence spray may occur fairly readily due to the growth of weed from the cracks. Lumpy and cloddy surfaces are difficult to protect with a uniform spray coverage. It has also been found that the soil should be reasonably moist and that the application of the spray to a dry powdery surface is unsatisfactory. The pre-emergence film will remain surprisingly effective under heavy tropical rainfall, but soil movement or ponding of water in the drills and inter-rows will cause a breakdown.

The recommended application per acre is 4 lb. of sodium salt of 2,4-D (approximately 80 per cent. acid equivalent). Less than three pounds per acre is seldom sufficiently effective. Very few instances have been

recorded of damage to cane. Malformation readily occurs if the weedicide is applied after the stalk has formed, but at this stage the crop provides a complete canopy over the soil, and weed growth is not significant. A heavy application (8-10 lb. per acre) to newly planted cane will cause damage and may prevent germination of the cane sett. This is particularly the case on sandy soils where the weedicide may be leached by rain down to the sett.

Although the sodium salt is the only form of 2,4-D used on cane farms, trials have been carried out with the diethanolamine and dimethylamine salts and the butoxy ethanol ester. No differences in the effectiveness of the pre-emergence control could be observed. Methoxone was also used in some trials but unfortunately weather conditions at the time precluded the possibility of achieving satisfactory results and in view of the growers' preference for using the solid form of weedicide the tests were not continued.

The spray is applied by means of boom sprays operated usually from the tractor power take-off. The amount of liquid used varies from 16 to 40 gal. per acre and the pressure used is about 35 lb. per square inch. Cane rows are planted 4 feet 6 inches apart and booms may cover from two to six rows depending upon the size of the equipment and the topography. Some packs of 2,4-D powder contain a spreader but it is difficult to observe any greater efficiency due to its presence. Difficulty is frequently encountered under farm conditions in dissolving 1 lb. of the sodium salt in less than 5 gallons of water.

When properly applied under suitable conditions the spray controls the emergence of all the weeds and grasses which normally constitute a nuisance in cane fields. Large seeded plants such as Mauritius bean and gambia pea are not affected but these are of little consequence as weed pests. In view of the fact that the control is not restricted no comprehensive list of the weed and grass population has been made but the following are those most commonly encountered: Panicum maximum, Eleusine indica, Echinochloa crus-galli, Panicum sanguinale, Digitaria adscendens, Brachiaria piligera, Ageratum conyzoides, Bidens pilosa, Ipomoea plebeia, Ipomoea quamoclit, Mimosa pudica, Lepidium hyssopifolium.

However, notwithstanding the general effectiveness of 2,4-D, conditions are not always suitable for its application. This has restricted the adoption of the method and out of some 400,000 acres cultivated to cane not more than about 5,000 receive pre-emergence treatment.