

PROBLEMS IN WEED CONTROL ON AN ESTATE

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Introduction

With the increasing use of herbicides in the fields of The Tongaat Sugar Company Limited it has become possible to make general observations on the influence of chemical control on the character of the weed population and the resultant change in the nature of the weed problem.

Broad-leafed Weeds

(a) 2, 4-D amine. Broad-leafed weeds are controlled largely by the use of 2, 4-D amine (7.2 lb a.e.*) applied at 2.7 lb a.e. per acre, for both pre and post emergent spraying. Pre-emergent spraying has not proved successful in the cooler months and as a result it is not practiced from May until the first spring rains. Susceptible weeds such as Blackjack (*Bidens pilosa*), St. Pauls weed (*Siegesbeckia orientalis*) and Pig weed (*Amaranthus spinosus*) have, under chemical control, almost been eradicated from many fields. With the lack of competition so engendered, certain weeds are appearing which are less susceptible to 2, 4-D. Foremost amongst these problem weeds is Mint weed (*Australina acuminata*).

(b) 2, 4, 5-T. An observation trial was conducted in conjunction with Kynoch-Capex in which several levels of diuron, linuron, 2, 4-D ester, paraquat, 2, 4, 5-T and some mixtures of these were tried on a stand of mint weed. Of the eighteen treatments, the four most effective proved to be 2, 4, 5-T at 1.15 lb a.e. per acre (cost R2.00), diuron at 4 lbs p.† per acre (cost R9.88), linuron at 3 lbs p. per acre (cost R8.10) and a mixture of 2 lb. diuron p., 1 pint paraquat p. and 1.15 lbs. 2, 4, 5-T a.e. (cost R9.22).

2, 4, 5-T was then tried on a field scale at 1.15 lb. a.e. per acre full cover, where it has proved to be completely effective in controlling mint weed. Increasing use is being made of 2, 4, 5-T in the control of other broad-leafed weeds which have grown too old to be controlled by normal field applications of 2, 4-D amine. Field results indicate that some control is also achieved on watergrass (*Cyperus sp.*). It has up to now only been regarded as a brush killer. It would appear from these limited observations that more intensive investigations are warranted on this herbicide with regard to its possible uses, both pre and post emergent on broad-leafed weeds and possibly with certain admixtures as a herbicide for the control of watergrass.

* a.e. = acid equivalent

† p. = product

Cyperaceae

Watergrass (*Cyperus esculentus*) in plant cane is easily controlled with paraquat at 2 pints p. per acre. The watergrass comes away ahead of the plant cane. Because of this the paraquat spray achieves maximum burn on the watergrass with minimum burn on the cane. In ratoon cane however the position is reversed so that, on spraying severe scorching of the cane results, with only an ineffective burn of the watergrass. Linuron at 4 lbs. per acre was tried as an alternative measure for watergrass control in ratoons. Initial results were most encouraging and excellent control was achieved for three months, with no visible damage to the cane. Subsequently however very disappointing results were obtained under very nearly identical conditions, and the herbicide was temporarily dropped as a recommendation. Moisture is believed to be the limiting factor but it is felt that critical investigations should be conducted on this herbicide, so as to establish the causes for its erratic performance.

Gramineae

As better control is gained over broad-leafed weeds, it is becoming increasingly apparent that effective control must be gained over grasses as well. Of the perennial grasses, Ubabe (*Panicum maximum*) and Mqangabodwe (*Sorghum verticilliflorum*) are the greatest problem. Ubabe is the worst invader of cane fields and competes fiercely with cane. Heavy treatments of Dalapon (up to 20 lbs. per acre) have been found to effect good control; however such severe treatments cannot be used in fields because of damage to the cane. A successful treatment for all grasses has been developed and is being used on a limited scale. The treatment consists of a light application of Dalapon (up to 3 lbs. per acre) followed by paraquat at 2 pints per acre from seven to ten days later. This treatment effects a total kill of Ubabe but also burns the cane quite severely. The cane does recover however. The treatment is meant specifically for use in young cane where it is possible to spot spray the Ubabe with very little damage to the cane. It has also been used with success in cane up to four feet tall but it was not possible under these conditions to spot spray and the cane was severely burnt and took about three weeks to recover. Complete kill of the Ubabe was achieved. This can only be achieved by hand weeding when the Ubabe stools are actually carried out of the field to prevent regrowth.

Discussion

It would appear from the above observations that problems in weed control are getting worse. As herbicides and techniques are developed which kill

susceptible weeds, so they are replaced by less susceptible ones and a vicious circle is developed. This leads to the comment from some that it would have been better never to have started in the first instance. This is not the case at all. The introduction of herbicides into regular cane farming practice has assisted enormously in reducing the weed population. Herbicides are only used when their use is economically justifiable as compared to mechanical control or hand weeding, or when shortage of labour or machinery or adverse conditions warrants their use. The attempts made to control other weeds apart from broad-leaved species, merely serves to illustrate that these weeds are now "seen" and that weed control is advancing to its ultimate goal of complete control.

Summary

Weed control problems are discussed from a practical estate view point, with reference to three main groups of weeds: Broad-leaved, Cyperaceae and Gramineae. The uses and limitations of 2, 4-D, 2, 4, 5-T and paraquat are described and a new technique for grass control is advanced which involves a split treatment of dalapon and paraquat.

Mr. Pearson: From experience in the Natal Midlands it is apparent that 2, 4-D is very effective if it is applied at the right time i.e. under correct weather conditions. On one occasion on a misty day 2, 4-D was applied in the furrow after planting and complete control of watergrass and all other weeds was obtained.

The next day was bright and sunny and 2, 4-D was again applied but did *not* effect control of water grass.

Mr. Wyatt: I feel that the authors of the papers could have paid more attention to the methods of application of herbicides.

Mr. Gilfillan: Work is being done along these lines and the following figures have been obtained so far:

1. One labourer using a knapsack spray can cover an area of two acres a day, at a cost of 60 cents/acre.

3. A tractor mounted sprayer under good conditions can spray 30 acres per day at a cost of only 30 cents per acre.

3. Aircraft spraying has proved difficult owing to the necessity to fly only six feet above the crop but new emulsions being used will enable a twenty feet clearance to be used.

Mr. Tucker: Has Mr. Booth any information about helicopter spraying in Zambia?

Mr. Booth: It has been carried out but it is very expensive and not entirely satisfactory.

Mr. Aucock: Has anyone tried herbicide in irrigation water.

Dr. Thompson: The application of overhead spray is not uniform enough for herbicide distribution.

Mr. Andries: We did one season of aerial application and the cost of application alone was 85 cents per acre, compared with 55 cents per acre for tractor sprayings, both on an irrigated lay-out. There are advantages in aerial spraying in being able to choose the optimum period for application and because of the enormous areas which can be covered quickly. One day, after $\frac{1}{2}$ inch of rain we did a blanket spray of 385 acres in one day—6.00 a.m. to 4.00 p.m.

We have also used for spraying a method used by Crookes Bros. on the South Coast, namely a portable boom with a small motor drive and two three hundred feet hoses. It is an eighteen feet boom carried by two men and is highly effective for hand application.

Mr. Johnson: The cost of helicopter spraying is two and half times that of a conventional aircraft and the down-draught of air from the rotors bounces back from the land and prevents proper penetration of the herbicide.

Mr. Wardle: If nozzles are correctly positioned in helicopters the disadvantage of the down draught can be overcome.

On tractor sprays the mist blower is used at present in the Free State on wheat crops. It has the advantage, for instance, of getting the same results from 2, 4-D with approximately half the recommended rate of application and doing 100 acres per day. The rig would have to be modified for our terrain.