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Observations on the comparative effectiveness of Aminotriazole and 2, 4-D Amine in the control of water hyacinth (*Eichhornia crassipes*)*

by

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Synopsis: Two chemical formulations of 2, 4-D and ATA were tested in the control of water hyacinth. Of the two, ATA was found superior on account of better control over a long duration, though slow acting.

Introduction: Water hyacinth (*Eichhornia crassipes*), a free floating fresh water weed is recognised as one of the world's worst aquatic weeds (Penfound and Earla, 1948). Its fast spread and multiplication in India warrants attention (Sen, 1947 and Sundaram and Mehta, 1960). Of several methods adopted for its control, the use of chemical weed killers have proved to be by far the most effective and economical (Sen, 1961.) Among chemicals used for control of water hyacinth, the amine formulations of 2, 4-dichlorophenoxyacetic acid (2, 4-D) have gained prominence (Hitchcock *et al*, 1949 and 1950; Seale *et al*, 1946; Sundaram and Mehta *loc cit*; Zimmerman *et al* 1950). Recently, it has been reported that 3-amino-1, 2, 4-triazole (ATA) offers better control than possible with 2, 4-D amines, (Seaman 1961). It was hence of interest to make a comparative study on the effectiveness of 2, 4-D amine and ATA in the control of water hyacinth. This paper summaries the observations made and their implications.

Materials and Methods: A tank of approximately seven acres completely covered with water hyacinth at Magadi, a place situated 32 miles away from Bangalore was chosen. The following are the details pertaining to treatments, plot size, method of application, chemical formulations used and nature and frequency of observations made:

Plot Size: The size of plot chosen per treatment was 1/10th of an acre.

Treatments: The treatments consisted of single applications of 2, 4-D amine and ATA at rates of 3 kg and 1/2 kg per acre. All dosages referred to are in terms of active ingredient and not on the quantity of formulations used. The dosages adopted in the present experiment were based on work done elsewhere, wherein above dosages were found to be very effective in control of water hyacinths (Hitchcock *et al*, 1949 and 1950; Seaman, 1961 and Zimmerman *et al*, 1950.) Both the chemicals were available commercially in liquid formulations that could be dissolved in water

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without difficulty. The commercial formulations used were: (i) in the case of 2, 4-D amine, a dimethyl amine formulation containing 720 grams of 2, 4-D per litre and (ii) in the case of ATA, a formulation containing 240 grams of aminotriazole and equal quantities of ammonium thiocyanate per litre. Sprayings were conducted on 30th October, 1962, in clear weather.

Method of application: All applications of chemicals were carried out with a hand operated high volume sprayer. A sticker called 'Tenac' was added to spray solutions at the rate of one ounce per 10 gallons. The volume of water used amounted to 200 gallons per acre.

Nature and frequency of observations recorded: In making a comparative study on the effectiveness of 2, 4-D and ATA, in the control of water hyacinths, the following main observations were made:

- (a) time taken for initial kill of aerial portions of water hyacinths following application of chemicals;
- (b) time taken for commencement of resprouting of water hyacinths in treated plots; and
- (c) extent of reinfestation of water hyacinths in treated plots measured by the area progressively covered by resprouting water hyacinths in treated plots.

The extent of resprouting was assessed and recorded on the following basis. If 1/4th of the treated area, for example, was covered by resprouting water hyacinths in treated plots, the reinfestation was taken as 25 per cent, and if 1/2 the treated area was covered as 50 per cent and so on.

Observations were made in the first two months at fortnightly intervals and thereupon at monthly intervals over a period of six months.

Results: The observations recorded are summarised below.

Comparative effectiveness of 2, 4-D and ATA.

Observations made	2, 4-D Amine at 3 kg / acre	ATA at 0.5 kg / acre
1. Time taken for killing aerial portions of water hyacinths	14 days after application	42 to 60 days after application
2. Occurrence of first resprouting	28 days after application	None
3. Extent of reinfestation in treated plots		
30 days after application	5 to 8%	None
60 days after application	35 to 45%	None
90 days after application	60 to 75%	None
180 days after application	100%	None

Discussion: The present experiment revealed two important features in the comparative effectiveness of 2, 4-D and ATA in the control of water hyacinths:

(i) For initial kill of water hyacinths following applications, ATA takes longer time than 2, 4-D, indicating that ATA is relatively slow acting than 2, 4-D.

(ii) ATA practically eliminates resprouting of water hyacinths over a long period (at least for six months as in the case of present experiment) unlike 2, 4-D, where resprouting and re-establishment of water hyacinths take place in a relatively short time. It, therefore, appears that repeated sprayings with 2, 4-D at suitable intervals would be necessary to prevent resprouting and re-establishment of water hyacinths.

The superiority of ATA in providing a better control over a long duration, practically eliminating resprouting than possible with 2, 4-D, deserves attention. Water hyacinths, essentially spread and multiply through vegetative propagation. If the chemical applied fails to move within the plants and affect the daughter shoots and other portions like stolons attached to the parent plants, resprouting is naturally possible. It is surmised that ATA unlike 2, 4-D had been translocated effectively from parent plants to other attached parts to affect them also. Such a view is confirmed by Seaman (1961) who had similar experience in controlling water hyacinths by using 2, 4-D and ATA.

Summary: A study was undertaken to compare the effectiveness of 2, 4-D and ATA in the control of water hyacinth. The study revealed that 2, 4-D was able to kill the aerial portions of water hyacinths much more quickly than ATA. But, ATA provided a longer duration of control, atleast over a period of six months, than 2, 4-D wherein resprouting was observed within a short time, and reinfestation was complete in a span of six months. The superiority of ATA over 2, 4-D was attributed to its better mobility within the plants affecting daughter shoots, stolons, etc, attached to the parent plants.

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STATE PRIZE WINNER IN THE SUGARCANE CROP YIELD COMPETITION, 1964-'65

Sri S. Kandaswamy Odayar, Melkalkandarkottai, of Trichy taluk and district has won the State Prize in the Sugarcane Crop Yield Competition held in Madras State during 1964-'65. He has produced an acre yield of 111 tonnes and 722 kg. Our congratulations to him.