

A STUDY ON THE EFFECTIVENESS OF POLARIS AS A CHEMICAL RIPENER OF SUGARCANE

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SUMMARY

A field trial was conducted at the experimental farm of the Sugarcane Research Institute, Ishurdi, Pabna, in the 1976-77 crop season to assess the effectiveness of Polaris as a chemical ripener of sugarcane. Four doses of Polaris viz., 0, 3, 4 & 5 lbs active ingredient per acre were sprayed on the green forage of Co. 1158 variety of sugarcane in mid-October and the treated crop was subjected to chemical analysis for recovery at 15 days interval. Upto the 30th day following the application, there was no significant increase in recoverable sugar due to the doses tested. The highest dose of 5 lbs a.i. per acre, however, registered a significant increase in recoverable sugar recorded at 45 days of application and the effectiveness of the chemical tended to diminish subsequently. Polaris was also found to induce some physiognomic effects like leaf desiccation, yellowing of leaf blades, inhibition of the spindle growth and sprouting of the terminal buds in the treated crop.

INTRODUCTION

The productivity of sugarcane which is conventionally expressed as tons sugar per acre (TSA), is the ultimate outcome of its growth and ripening process. In our country, the milling of sugarcane normally starts by the middle of November. At the beginning of the milling season, the unfavourable soil and climatic factors do not provide good natural ripening of sugarcane (Yang 1967, Alexander 1973) and as such the recovery of sugar is considerably low. To overcome such unfavourable agro-climatic conditions and to enhance the recovery (and thereby the ultimate productivity), the use of chemical ripeners like Polaris, Racuz, Ethrel, etc. is being tried in many advanced sugarcane growing areas of the world (Yates and Bates 1957, Vlitos and Lawrie 1965, Nickell and Tanimoto 1965, Nickell and Takahashi 1971, Yates 1972, Rostron 1973, Yang and Pao 1974, Selleck et al 1974, Frost 1975, Yang et al 1976). The present study was undertaken to assess the effectiveness of different doses of Polaris—a chemical ripener of sugarcane with empirical formula $C_4H_{11}NO_8P_2$ developed by Monsanto Agricultural Products Company (U.S.A.), in increasing recovery of sugar in Co. 1158 variety of sugarcane at the early milling season.

MATERIALS AND METHODS

The study was conducted during the period from October 15 through December 15, 1977 at the experimental farm of the Sugarcane Research Institute (SRI), Ishurdi, Pabna with Co. 1158 variety of sugarcane planted in December 1976 in 3.5 feet apart rows. Four rates of Polaris viz., 0, 3, 4 and 5 lbs active ingredient (a.i.) per acre diluted in 55 gallons of water were sprayed on the green foliage of the full grown crop on October 15, 1977 with the help

of a handy power sprayer. The plots under the control treatments were sprayed with water only. The experiment was laid out in a Randomized Complete Block design with four replications. The area under each unit plot was 350 sq. ft. Normal doses of fertilizers i.e., Urea, Triple Super Phosphate (TSP) and Muriate of Potash (MP) at the rates of 3 mds. 3 mds. and 2 mds. per acre respectively were applied. Full quantity of TSP and one-third quantity each of Urea and MP were applied as basal dressing. The remaining two-thirds were applied later in two equal splits. Other standard cultural practices like weeding, mulching, earthing up, etc. were maintained.

The initial recovery of sugar just prior to the application of Polaris was determined through the conventional Hornes' Lead-Sub-acetate method. The treated crop was subsequently analysed at 15 days intervals by the same method for brix, pol, purity and recovery. The analyses were continued upto 60 days of application of Polaris and the results of the period analysed in terms of % recoverable sugar were recorded and statistically analysed.

RESULTS AND DISCUSSIONS

The results of the present study have been reported in Table I. Data show that upto the 30th day following the application of Polaris, there was no significant increase in recoverable sugar in the treated crop due to the different doses tested. However, the highest dose of 5 lbs. a.i. per acre registered a significant increase in recoverable sugar recorded at 45 days of application. Data further indicated that the effectiveness of the chemical tended to diminish subsequently (Table I). Similar positive results of Polaris were obtained by scientists working on chemical ripening of sugarcane at different countries (Anon. 1971, Samuels et al 1976). Apart from the above, Polaris was found to induce some physiognomic effects like leaf desiccation, yellowing of leaf blades, inhibition of spindle growth and sprouting of the terminal buds (Fig. 1). Side effects of this nature due to Polaris application were also reported in other countries (Anon. 1974).

Table-I Effects of different doses of Polaris on recoverable sugar at different dates.

Treatment	% recoverable sugar recorded as on				
	Dates of application (Initial level)	15th day of application	30th day of application	45th day of application	60th day of application
To-Control	6.99	6.74	8.30	8.97	9.11
T ₁ -Polaris @ 3 lbs a. i per acre.	6.66	6.94	8.41	8.96	9.37
T ₂ -Polaris @ 4 lbs a.i. per acre.	6.89	7.11	8.71	9.19	9.88
T ₃ -Polaris @ 5 lbs a.i. per acre.	6.88	7.09	8.38	9.58	9.99
L.S.D at 5% level.	—	—	—	0.43	—

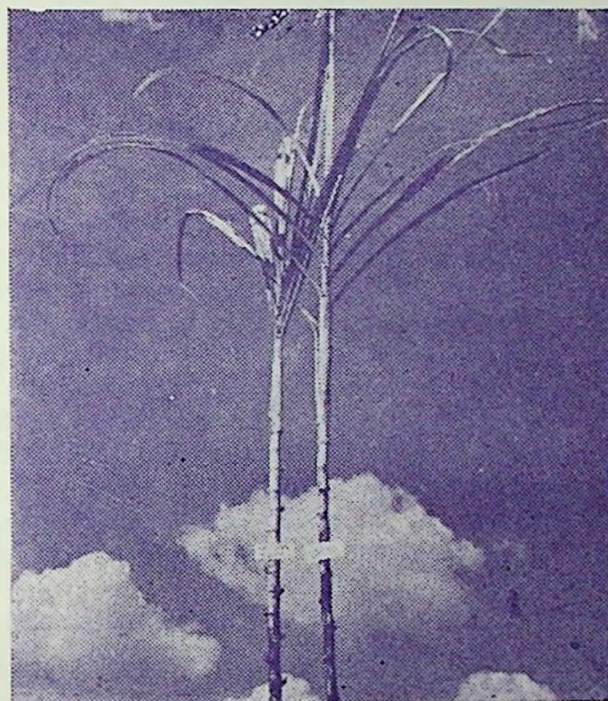


Figure 1. Photograph showing the visible side effects of Polaris on the treated crop.

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