

**EFFICACY OF CERTAIN GROWTH REGULATORS IN INDUCING
FLOWERING IN PINEAPPLE (*ANANAS COMOSUS*)**

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Ethrel (2-chloro-ethyl-phosphoric acid), the ethelene releasing growth regulator has been reported to be very effective in inducing uniform flowering in pineapple. Randhawa, Das and Chacko (1970) found that ethrel at dosages 62.5, 125, 250, 500, 1000 and 2000 ppm was superior to other growth regulators like NAA and NAD in inducing over 90 per cent flowering in pineapple within 50 days after the application, Ali and Thalukdar (1965) reported that the maturity of the pineapple fruit was delayed when higher concentration of ethrel was used. In the preliminary studies conducted at the Pineapple Research Centre, Kerala Agricultural University Main Campus, using ethrel at concentrations 100, 250, 500, 1000 and 1200 ppm, it was observed that concentrations of ethrel above 500 ppm were more effective in inducing flowering in pineapple in plant crop (Anon, 1976). In Kerala, the percentage of flowering is only 30 to 40 in pineapple under natural conditions in plant crop. Therefore, in order to screen a more cheaper form of growth regulator for inducing maximum percentage of flowering that too with shorter duration, an experiment was conducted in 1976 season at the Pineapple Research Centre, Vellanikkara using different chemicals, growth regulators and combinations.

Materials and methods

The experiment consisted of six treatments namely three concentrations of ethrel at 100, 500 and 1000 ppm one concentration of acimone (NAA based product) at 10 ppm and two combination treatments viz., 25 ppm ethrel + 2% urea + 0.04% calcium carbonate. One hundred plants of plant crop of 16 months possessing 40-42 leaves and ratoon crop of 11-12 months (20-30 leaves) were subjected to each treatment by adopting application of 50 ml of solution in the heart of plants during the months of November, December, January and February. All the plants selected received uniform fertilizer and cultural treatments.

In plant crop, only the percentage of flowering was recorded. The data on vegetative growth of plants viz., number of leaves, length and width of "D" leaf at the time of growth regulator application, percentage of flowering, yield, fruit characters such as mean fruit weight, mean crown weight and L/B ratio of fruits were recorded and analysed in completely randomised design for ratoon crop.

Table 1

Percentage flowering of pineapple in different months of application in plant and ratoon crops due to growth regulator application

Treatments	Percentage of flowering											
	November		December		January		February		Mean			
	A		B		B		B					
1. Ethrel 100 ppm	78.00	85.70	70.00	70.00	76.00	56.00	32.00	32.00	64.00	60.92		
2. „ 500 ppm	81.00	92.30	87.00	92.30	80.00	64.00	87.00	100.00	83.75	87.12		
3. „ 1000 ppm	88.00	90.00	71.00	90.00	85.00	80.00	90.00	80.00	83.50	85.00		
4. Ethrel 100 ppm + 2% urea + 0.04% CaCO ₃	85.00	100.00	89.00	100.00	98.00	100.00	98.00	100.00	92.50	100.00		
5. Ethrel 25 ppm + 2% urea + 0.04% CaCO ₃	90.00	98.00	92.00	98.00	98.00	100.00	98.00	98.00	92.50	98.50		
6. Acimone 10 ppm C. D. at 1% level	15.00	14.00	12.00	14.70	17.00	18.00	11.00	16.00	13.75	15.68		
									22.31	23.16		
	A. Plant crop						B. Ratoon crop					

It is seen from Table 1 that in both the plant and ratoon crops, treatments 4, 5, 2 and 3 have contributed for maximum percentage of flowering compared to other treatments in all the months tried. There was not much variation in the extent of flowering between the two treatments ethrel 500 ppm and 1000 ppm. But ethrel in combination with urea and calcium carbonate has given excellent results even at lower concentration of 100 ppm and 25 ppm. Acimone was found to be significantly inferior than ethrel and combinations of ethrel, urea and calcium carbonate.

The results show the treatment differences are significant only in respect of mean weight of fruits without crown and L/B ratio out of the total of eight characters studied. The highest value for fruit weight was recorded in treatment 6 followed by treatment 4. With reference to L/B ratio of fruits also the treatment 4, was found to be superior. In all cases, the fruits possessed multiple crowns. Ethrel induces formation of ethelene in plant system which is responsible for the induction of flowering in pineapple. The present study has revealed that the percentage of flowering was highest when plants are treated with combi-

Table 2

Data on growth and fruit characters in ratoon crop pineapple due to growth regulator application

Treatment	Mean number of leaves	Mean length of 'D' leaf (cm)	Mean width of 'D' leaf (cm)	Mean fruit weight with crown (kg)	Mean weight of fruit without crown (kg)	Mean weight of crown (kg)	Mean number of crowns	L/B ratio
1. Ethrel 100 ppm	27.6363	77.1818	5.8090	1.4409	0.7400	0.7009	3.8181	0.9888
2. „ 500 ppm	24.2480	77.4172	5.8310	1.3928	0.6761	0.7167	3.9041	0.9755
3. „ 1000 ppm	24.8235	76.2352	5.7882	1.3176	0.6517	0.6659	2.3529	0.9737
4. Ethrel 100 ppm + 2% urea + 0.04% CaCO ₃	25.4375	75.5625	5.6937	1.6281	0.9333	0.6948	5.1250	1.1593
5. Ethrel 25 ppm + 2% urea + 0.04% CaCO ₃	29.7500	76.7500	5.7625	1.5937	0.8375	0.7562	2.1250	1.0
6. Acimone 10 ppm	28.3333	76.3033	5.6032	1.7000	0.9331	0.7669	4.6666	1.0424
Significance	NS	NS	NS	NS	significant	NS	NS	significant
CD at 1% level					0.02			0.0112

nations of ethrel, urea and calcium carbonate. Further, the combination treatments have helped to get better shaped uniform fruits. In respect of fruit weight, treatments 4,6 and 5 were superior. It can be seen that in inducing flowering as well as increasing the fruit weight and shape, ethrel in combination with urea and calcium carbonate is preferable to application of ethrel alone or any other chemicals tried.

The cost of application of the three best treatments worked out indicated that the combination treatment 25 ppm ethrel + 2% urea + 0.04% calcium carbonate was the cheapest involving a cost of 1.2 paise per plant, the next best being the combination treatment of 100 ppm ethrel + 2% urea + 0.04% calcium carbonate involving an expenditure of 1.53 paise per plant as against the expenditure of 3.11 paise per plant if application of 500 ppm ethrel is resorted to. Thus, from the economic point of view also, it is advisable to recommend the usage of the combination treatment of 25 ppm. ethrel, 2% urea and 0.04% calcium carbonate.

Summary

A study was undertaken at Pineapple Research Centre, University Main Campus, Vellanikkara in 1976—77 to find a cheaper growth regulator

for uniform flower induction in pineapple. The findings showed that a combination treatment of 25 ppm ethrel, 2% urea and 0.04% calcium carbonate was much effective than ethrel application alone ensuring higher percentage of flowering and production of better sized, shaped and uniform fruits. The cost of treatment was found to be low, 1.2 paise per plant.

സംഗ്രഹം

കേരള കാർഷിക സർവ്വകലാശാലയുടെ ആസ്ഥാനമായ വെള്ളാനിക്കരയിലെ കൈതച്ചക്ക ഗവേഷണ കേന്ദ്രത്തിൽ 1976-77-ാം വർഷങ്ങളിൽ കൈതച്ചക്കയിൽ കൃത്രിമ പുഷ്പിക്കൽപ്രക്രിയ കൂട്ടതൽ അഭയകരമാക്കിത്തീർക്കാൻ ഉതകമാറു വിവിധ വൃദ്ധിനിധനുക വസ്തുക്കളുടെ പ്രയോഗത്തെക്കുറിച്ച് പഠനം നടത്തി ലഭിച്ച ഫലങ്ങളിൽ നിന്നും 25 ppm എത്തിൽ, രണ്ടു ശതമാനം യൂറിയ, 0.04 ശതമാനം കാൽസിയം കാർബണേറ്റ് അടങ്ങിയ സംയോജിത പ്രയോഗം കൂട്ടതൽ ഫലവത്താണെന്ന് തിരിച്ചറിയപ്പെട്ടു. ഈ പ്രയോഗം രാജ്യം (rajajTcfctoiBOce) കാനിംഗ് തോതു്, രൂക്കം എന്നിവയുള്ള കൈതച്ചക്ക ലഭിച്ചതിനുപുറമേ, ഇതു് വളരെ ചെലവുകുറഞ്ഞ (ചെടി ഒന്നിന് 1.2 പൈസ മാത്രം) ഒരു പ്രയോഗമാണെന്നും തെളിഞ്ഞു.

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