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SEASONAL BEHAVIOUR OF PLANT GROWTH REGULATOR IN INDUCING FLOWERING IN PINEAPPLE

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Unsaturated hydrocarbons like ethylene, acetylene, auxins like naphthaleneacetic acid (NAA), naphthalene acetamide (NAD) chemicals like calcium carbide, commercial products like "Ethrel" "Planofix" and "Acimone" have been reported to be effective in inducing flowering in pineapple. Earlier studies conducted at the Pineapple Research Centre, Kerala Agricultural University, Vellanikkara indicated that some of these substances were not effective in inducing flowering at doses tried elsewhere (Anon, 1976). This investigation was therefore undertaken to evaluate the efficacy of different chemicals and growth regulators in inducing flowering in pineapple during the different months of the year.

Materials and Methods

Ethrel, coarsely ground powder of calcium carbide, acimone and a combination of ethrel, urea and calcium carbonate were applied as detailed in Table 1 in the heart of suckers of the plant crop as well as in one year old ratoon crop in Kew variety of pineapple. Twenty-five plants were randomly selected for each treatment in each month. Hormones were applied in every month from May 1976 to February 1977. The percentage of flowering was recorded for each treatment in each month. To assess the seasonal performance of the treatments, the techniques suggested by Finaly and Wilkinson (1963) and those by Eberhart and Russel (1966) were followed. The stability parameters are defined to the model $Y_{ij} = M_i + B_i I_j + e_{ij}$ where Y_{ij} = mean performance of the i^{th} treatment in the j^{th} month B_i = regression coefficient of i^{th} treatment's mean performance on environmental index, M_i = mean of the i^{th} treatment, e_{ij} = deviation from j^{th} environmental index. The I_j is the relation

$$I_j = \frac{\sum_{i=1}^{n} Y_{ij}}{n} - \frac{\sum_{i=1}^{n}\sum_{j=1}^{n} y_{ij}}{n}$$

Results and Discussion

The percentage of flowering corresponding to the different treatments during the different months of the year are given in Table 1.

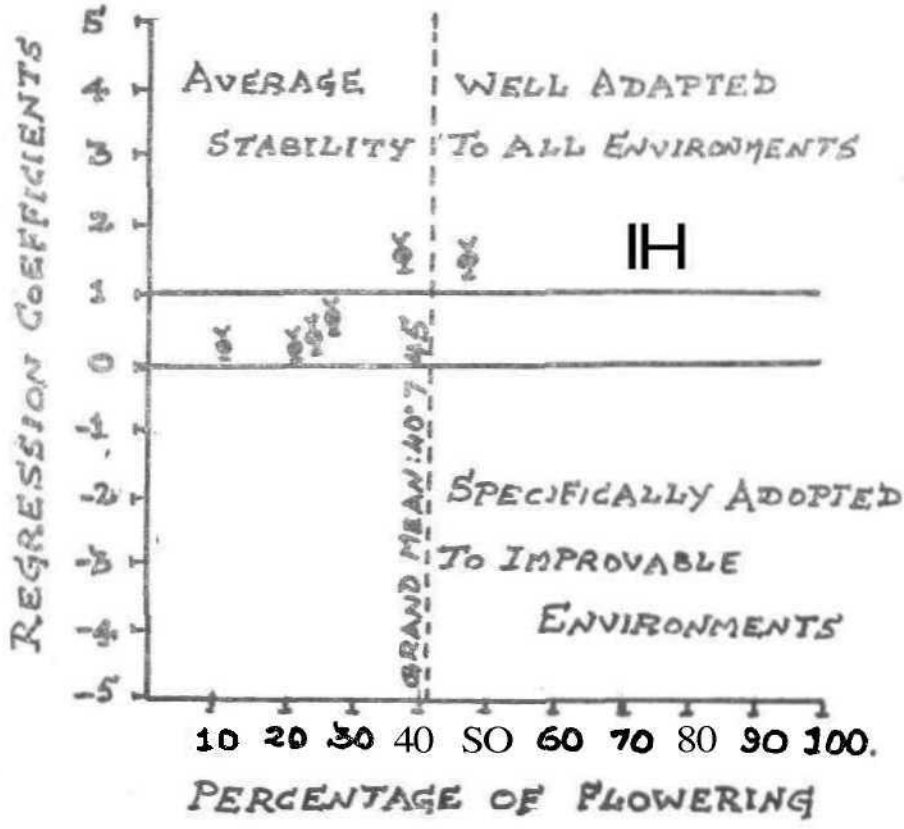
Table 1

Percentage of flowering and regression coefficient for different treatments

Treatments	Months											
	May 77	June 76	July 76	August 76	September 76	October 76	November 76	December 76	January 77	February 77	Mean	Regression coefficient
T_1 Ethrel 110 ppm	16.0	20.0	27.0	20.0	12.0	92.0	80.0	80.0	52.0	88.0	48.7	1.58
T_2 ,, 500 ppm	56.7	13.2	37.9	53.0	52.0	92.0	100.0	100.0	100.0	100.0	70.4	1.53
T_3 ,, 1000 ppm	40.0	34.2	32.0	56.0	76.0	96.0	100.0	96.0	88.0	100.0	71.8	1.50
T_4 Planofix 10 ppm	14.0	12.0	4.0	20.0	40.0	48.0	35.7	48.0	14.0	17.0	25.3	0.72
T_5 ,, 30 ppm	7.0	19.0	8.0	16.0	43.0	24.0	7.7	44.0	20.0	18.0	20.7	0.47
T_6 ,, 50 ppm	8.0	6.0	2.0	12.0	20.0	16.0	10.7	13.0	4.0	8.0	10.8	0.19
T_7 Calcium carbide	13.0	11.0	7.0	14.0	68.0	87.0	29.0	4.0	10.0	6.0	18.9	0.20
T_8 Acinone 10 ppm	17.0	2.0	6.0	15.0	27.0	40.0	75.0	100.0	36.0	52.0	37.0	1.54
T_9 Ethrel 500 ppm + 2% urea + 0.04% calcium carbonate	43.0	40.0	37.0	23.6	50.8	100.0	100.0	100.0	52.0	44.4	63.4	1.46
Mean	23.8	17.5	17.8	25.8	43.8	59.4	60.5	84.0	47.1	47.7		
C. D. (5%)										11.07		

DIAGRAM-1

PHENOTYPIC STABILITY OF 9 TREATMENTS



In general, maximum percentage of flowering was observed during October, November and December months. So there is a clear evidence that hormones exert their effect just prior to the natural flowering in pineapple viz. Jan—March. It has been found that ethrel at 1000 ppm and its combination with urea and calcium carbonate induce high percentage of flowering in the off season of June -July. It is also noticed that ethrel and its combination with urea and calcium carbonate give maximum flowering during October to January, while other traatments were not so effective during the above period. Randhava *et al.* (1970) found similar performance of NAA in their studies conducted during May and March

In the present study, treatments T1, T2, T3, T9 and T8 have regression coefficient greater than unity and comparatively high percentage of flowering. I t shows that ethrel alone and in combination with urea and calcium carbonate can perform well in every month throughout the year. It is economical to use ethrel in combination with urea and calcium carbonate because only a very low concentration of ethre! is required to produce the desired effect. The stability parameters are also presented in visual form in diagram I.

It was found that T3, T2 and T9 produced significantly higher percentage of flowers than all the other treatments including T1 . Thus, ethrei 500 ppm, ethrel 1000 ppm and ethrel 100 ppm 2% urea ; 0. 04% calcium carbonate were more effective than other treatments in inducing flowering in pineapple. These three treatments did not differ significantly among themselves. From the farmer's point of view, the best treatment is the one which is more, effective as well as less expensive. Thus, ethrel at 100 ppm + 2% urea + 0.04% calcium carbonate can be recommended to induce flowering in pineapple under Kerala conditions as the treatment will cost only 1.53 paise per plant compared to 3.11 paise per plant if ethrel alone at dosage of 500 ppm is resorted to.

Summary

Studies conducted to evaluate the efficacy of different growth regulators such as ethrel in different concentrations, planofix in different concentrations, calcium carbide, acimone and a combination of ethrel urea and calcium carbonate from May to February revealed that Ethrel would give comparatively better performance throughout the year under Kerala conditions. But ethrel in combination with urea and calcium carbonate was most effective. It was also cheaper than ethrel in higher concentrations and induced equally good percentage of flowering in pineapple.

സംഗ്രഹം

ചില വ്യാവിനിയന്ത്രക വസ്തുക്കളുടെ പ്രയോഗം കൈതച്ചക്കയിൽ പുഷ്പനം ത്വരിത പ്പെടുത്തുന്നു. എത്രിൽ, പ്ലാനോഫിക്സ്, കാൽസിയം കാർബൈഡ്, ആസിമോൺ തുട

ങ്ങിയ വൃദ്ധി നിയന്ത്രക വസ്തുക്കൾക്ക് ഇതിനുള്ള കഴിവു പരിശോധിച്ചപ്പോൾ ഏറ്റവും മെച്ചപ്പെട്ടതായി കണ്ടത് എത്റിൽ ആകുന്നു. കേരളത്തിലെ കാലാവസ്ഥയിൽ ഏതാണ്ട് എല്ലാമാസങ്ങളിലും ഉയർന്ന നിരക്കിലുള്ള rafig-jmCWWirra° എത്റിലിന്റെ പ്രയോഗം പ്രയോജനപ്പെടുന്നു. എത്റിലും, യൂറിയായും, കാൽസിയം കാർബണേറ്റും ചേർന്നുള്ള സംയുക്തം എത്റിലിന്റെ ഉയർന്ന സാന്ദ്രണങ്ങളേക്കാൾ ചെലവു കുറഞ്ഞതാണ്. അതിനാൽ കൈതച്ചെടിയിൽ വർഷം മുഴുവൻ പൂക്കൾ ഉല്പാദിപ്പിക്കുന്നതിനും, തദ്വാരാ കൈതച്ചക്കയുടെ വിളവ് പരമാവധി വർദ്ധിപ്പിക്കുന്നതിനും അകാലങ്ങളിൽ ഫലമുല്പാദിപ്പിച്ച് rawjsooaio വർദ്ധിപ്പിക്കുന്നതിനും എത്റിലും, യൂറിയായും, കാൽസിയം കാർബണേറ്റും ചേർന്നുള്ള സംയുക്തം ഉപയോഗിക്കേണ്ടതാണ്.

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