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RESPONSE OF CHILLI GENOTYPES TO ETHEPHON WHOLE PLANT SPRAYS*

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The beneficial effects of different plant growth regulators on vegetable crops have been highlighted by many workers (Choudhury and Singh, 1960; Adlekha and Verma, 1964; Singh and Choudhury, 1966; Mehrotra *et al*. 1970.) Nephthalene acetic acid is effective to reduce flower drop in chilli (Chandra *et al*., 1976, Chandramony and Mary, 1976). Preliminary reports are available on the use of ethephon to promote red colour development in pimento (Lockwood and Vines, 1970; Sims *et al*., 1970). The present study was formulated to elucidate the differentia] behaviour of chilli genotypes to ethephon sprays and to classify them into positive-responsive, negative-responsive and non-responsive types. Response to auxin in tomato was reported as a function of varieties used, type of sprays given, plant part(s) sprayed, concentration used and time of spray (Joseph and Peter, 1981).

Materials and Methods

The experimental materials consisted of 15 genotypes during the first season (May-December, 1981) and 8 genotypes during the second season (October-March, 1981-82). During the second season though 15 genotypes were transplanted only 8 survived in the field. These promising lines were selected from a germplasm collection of 155 lines maintained at the Department of Olericulture, College of Horticulture, Kerala Agricultural University, Vellanikkara, India. The annual forms *(Capsicum annuum* L.) and the perennial forms *(Capsicum frutescens* L.) were also represented in the genotypes. Both the trials were conducted in a split plot design with 3 replications taking 4 concentrations of ethephon (0, 100, 200 and 300 ppm) in main plots and the genotypes in subplots. There were 2 rows/genotype/main plot and 10 plants/row at a spacing of 45 cm x 45 cm. Ethephon was applied as whole plant sprays, 15 and 30 days after transplanting. Five plants of each genotype were randomly selected and the morphological characters, plant height, primary branches/plant, days to first fruitset, days to first red chilli harvest and yield were recorded from each of them. The fruit characters, length, weight and seed weight were recorded from 20 randomly selected fruits from each genotype. The data were analysed using the analysis of variance technique for a split plot design. The linear and quadratic relationships, if any, between various plant characters and levels of ethephon sprayed were worked out through simple regression equations where significant differences were observed due to different levels of growth regulators (Ostle, 1954).

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Results and Discussion

Significant differences were observed among the genotypes for all the characters under study during both the seasons. The effects of levels of ethephon were significant only for days to first fruitset and days to first red chilli harvest during both the trials. The interaction between genotypes and levels of ethephon was significant only for days to first fruitset. In the second trial interaction was nonsignificant. The trend noted in a few characters are explained below.

Days to first fruitset

The application of ethephon at 100 ppm delayed fruitset in all the genotypes except CA 89. The line CA 99 set fruit 51 days after transplanting while the unsprayed control had its first fruit 39 days after transplanting. The delay was more conspicuous with increasing concentration of ethephon. In the second trial ethephon at 100 ppm delayed fruitset in the genotypes Pant C1, NP 46A, CA 59 and CA 47 while the other 4 genotypes G 4, K 2, CA 39 and CA 99 showed earliness. The genotype K 2 set fruit earlier (37 days). As the concentration of ethephon was increased delay in fruitset was exhibited by more number of genotypes in the second trial also. At 200 ppm, fruitset was delayed in 5 genotypes while at 300 ppm 7 genotypes exhibited this delay.

Days to first red chilli harvest

The application of ethephon at all concentrations increased the number of days to first red chilli harvest in all the genotypes in the first trial. This increase was more conspicuous in ethephon sprays at 100 and 200 ppm. The treatment of 300 ppm showed a reduction in the number of days required for first red chilli harvest. In the second trial, the sprays at 100 ppm caused a reduction in the number of days to red chilli harvest in the genotypes G 4, K 2, CA 59, CA 39 and CA 99, At 200 ppm and 300 ppm concentrations, only the genotype K 2 showed earliness.

Yield/plant

Though the effects of levels of ethephon were not statistically significant for yield an increasing trend was noted by the application of ethephon. Yield increased in 11 of the 15 genotypes with ethephon whole plant sprays (100 ppm) in the first trial (Table 1). The increase was maximum in the line CA 9 (211.33 g/plant). At 200 ppm concentration, 8 genotypes showed increased yield with the maximum in Pant C1 (153 g/plant) when compared to the control (90 g/plant). In the second trial, 4 out of the 8 genotypes exhibited increase in yield by the application of ethephon (100 ppm). The genotype CA 39 (25.67 g) showed no response to 100 ppm ethephon. But at 200 ppm, there was a slight increase in yield. Only 3 genotypes recorded increase in yield by the application

Table 1

Response of 15 chilli genotypes to ethephon sprays, yield/plant (g)

Genotypes	Concentration of ethephon sprays				Mean ±5.45
	0 ppm	100 ppm	200 ppm	300 ppm	
Pant C1	90,00	121.00 (+ 34.44)	153.00 (+70.00)	113.67 (+ 26,30)	119.42
CA 89	209.67	249.67 (+ 19.08)	170,67 (-18.60)	223.00 (+ 6.68)	213.25
CA 99	140.33	211.33 (+50.60)	171.67 (+ 22,33)	127.00 (- 9.50)	162.58
CA 10	130.67	99.67 (-25.25)	88.00 (—32.65)	91,67 (29.85)	102,50
CA 12	97.67	113.00 (+ 17.07)	98.33 (+ 6.68)	110.33 (+ 12.96)	104.83
CA 24	137,00	123.00 (-10.22)	101.00 (—26·28)	91.67 (-33.09)	113.77
CA 27	89.33	113.67 (+ 27.25)	115.33 (+ 29.11)	109.67 (+22.77)	107.00
CA 30	109,00	125.67 (+ 15.29)	86,33 (-20.80)	106.33 (- 2.45)	106.83
CA 47	122.00	100.67 (-17.48)	109.67 (-10.11)	85.67 (-29.78)	104.50
CA 48	84.67	90.00 (+ 6.30)	116.00 (+ 37.00)	88.33 (+ 4.32)	94.75
GA	141.00	122,33 (-13.71)	115.33 { 18.67)	167.00 (+ 18.44)	136.42
K2	130.67	172.33 (+ 31·88)	102.33 (-21.69)	108.33 (-17.10)	128.42
NP 46A	100.00	142.33 (+42.33)	106.33 (+ 6.33)	140.33 (+ 40.33)	122.25
CA 39	85.00	97.00 (+ 14.12)	92.00 (+ 8.24)	93.33 (+ 9.80)	91.82
CA 59	97.33	137.67 (+ 41.45)	127 67 (+ 31.17)	113.33 (+ 16.44)	119.00
Mean ±17.30	117.62	134.62	116.91	117.98	

(Data in parenthesis indicate percentage increase or decrease over control)

of ethephon (200 ppm). At 100 and 300 ppm concentrations the genotype K 2 showed negative response, while at 200 ppm, it was non-responsive. All the genotypes except CA 99 exhibited reduction in yield by the application of 300 ppm ethephon.

Quadratic equation ($Y = 90{,}09 + 1.13X - 0.75X^2$) was significant only for days to first red chilli harvest. The response equations both linear and quadratic were not significant for days to first fruitset during the second crop season. The genotype x ethephon interaction was significant ($P + 0.05$) only for days to first fruitset in the first trial. This implies different types of response exhibited by different genotypes to ethephon sprays.

Delay in first red chilli harvest observed in the ethephon sprayed plants was a corolary to the observation of delayed fruitset. The trend increase was more conspicuous in the first season than in the second season indicating that has got some effect on plant growth and yield. Differential response to ethephon application was observed only for days to first fruitset. The use of ethephon as a growth regulator in chilli has only a limited value.

Summary

Response of chilli genotypes to 4 levels of ethephon (0, 100, 200 and 300 ppm) was studied during May-December 1981 and October-March 1981-82 seasons. The 4 levels of ethephon made significant differences for days to first fruitset and days to first red chilli harvest. Yield increased with ethephon application though it was not statistically significant. Plant stature was affected resulting in dwarf plant habit. Differential response to ethephon application was recorded only for days to first fruitset. Ethephon has only a limited use in chilli.

സംഗ്രഹം

എത്തിഫോൺ എന്ന രാസപദാർത്ഥവും മുളകിന്റെ ഇനങ്ങളും തമ്മിലുള്ള പ്രായോഗിക ബന്ധത്തെപ്പറ്റി പഠനം നടത്തി. എത്തിഫോണിന്റെ നാലു സാന്ദ്രത നിലവാരങ്ങളും മുളകിൽ പൂവ് പ്രത്യക്ഷപ്പെടുന്നതും ചുവന്ന കായ്കൾ തരുന്ന കാലത്തേയും ബാധിക്കുന്നതായി കണ്ടു. കായ്കളുടെ തൂക്കത്തിൽ വർദ്ധനവുണ്ടായി. ചെടികളുടെ ഉയരം കുറയുകയും ചെയ്തു. എത്തിഫോൺ രാസപദാർത്ഥം മുളകിനങ്ങളിൽ വ്യത്യസ്ത രീതിയിൽ പ്രവർത്തിക്കുന്നതായി കണ്ടു. കായ്കൾ രൂപം പ്രാപിക്കുന്നതിലാണ് ഇത് പ്രകടമായി കൂടുതൽ നിരീക്ഷിച്ചത്.

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