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EFFECT OF ETHREL TREATMENTS ON YIELD AND CHEMICAL COMPOSITION IN ROSELLE (*HIBISCUS SABDARIFFA* . L.)

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Abstract

The effect of ethrel on roselle was studied during 1988 and 1989 seasons in Sids Hort. Res. Station, Beni Swaif Governorate. Three levels of ethrel : 0 , 125 and 375 ppm as foliar spraying were used.

Results showed that ethrel treatments increased the yield of fresh sepals per plant or per plot, total organic acid in dry sepal and anthocyanine concentration in dry sepals.

INTRODUCTION

Roselle (*Hibiscus sabdariffa*, L.) Fam. Malvaceae is one of the important medicinal plants cultivated in Egypt . The plant is an annual bushy sub-shrub, with slight branching erect, smooth and often purplish stem. The dried fleshy calyx is used commonly to prepare drinks (Kirby 1963) and used as hypotensive agent, since it lowers blood pressure without producing side effect (Sharaf 1962).

Few was found in the literature dealing with the effect of ethrel on medicinal plants especially roselle.

Kher (1973) demonstrated that ethrel treatments increased the flowering of

chrysanthemum. Similar result was observed by Pappish and Muthuswamy 1974 on Dahlia spp., Ali 1976 on carnations. Al-Badawy 1977 reported that ethrel increase flowering of Adonis.

The aim of this investigation was to study the effect of different levels of ethrel treatments on yield and chemical contents in roselle.

MATERIALS AND METHODS

The present study was carried out during 1988 and 1989 seasons, at the farm of Medicinal and Aromatic Plants Research Section of Horticultural Research Station at Sids, Beni Swaif Governorate, Egypt. Seeds of *Hibiscus sabdariffa* l. were obtained from the. Medicinal and Aromatic Plants Research Section of the Ministry of Agricultural at El-Kanater El-Khairia experminet statioan. The seeds were sown in nursery in May 5th in both seasons. The experiment was designed as randamized blocks in 3 replicates, experimetal plots were 2x2.5 = $5m^2$. There were 4 ridges spaced 60cm apart and 40 cm distance between plants in every plot. A guard row between every two treatments was left .

Forty days after sowing seedling were transplanted to the exprimental plots. Ethrel was used in this experiment at concentrations of O, 125 and 375 ppm .

The concentrations were sprayed two times; the first was September 9th and the second September 24th in both seasons.

All fruits of ten plants from each treatment wer collected twice , the first on November 30th and the second was on December 30th and the following data were recorded :

Fresh and dry weights of sepals per plant and per plot, percentage of organic acid in dry sepals and anthocyanin content in dried sepals were determined according to the procedure described by Fuleki et al. 1968.

Data were statistically analyzed according to the procedure described by Snedecor 1967.

RESULTS AND DISCUSSION

Effect of ethrel on fresh weight of sepals per plant and per plot:

Data in Table 1 show that ethrel treatments significantly increased fresh weight of sepals per plant and per plot. These results may be due to the increase of flower and fruit amount per plant. These results are in harmony with those obtained by Kher (1973) on Chrysanthemum, Pappish and Muthuswamy (1974) on Dahlia, Ali (1976) on carnations and Al Badawy (1977) on Adonis. They reported that ethrel increase the flowering of plants.

The stimulating effects of ethrel treatments in increasing the fruit production of treated plants, may be due to their stimulating influence of flower production as well as their own effect on fruit-setting.

Effect of ethrel on dry sepals per plant and per plot :

Data shown in Table 2 illustrate that weights of dry sepals per plant and per plot are significantly increased by ethrel treatments. These results may be due to the increase of fresh sepals per plant and per plot.

It was found that both the two ethrel concentrations in creased sepals yield over control, but little differences were found between them. In general it could be stated that the best ethrel concentration is 125 ppm in order to obtain higher sepal yield.

Effect of ethrel on organic acid and anthocyanine :

It is clear from data listed in Table 3 that there is a significant increase in both total organic acid or anthocyanine in dry sepals.

It was found that anthocyanine and organic acid concentrations increased gradually by increasing ethrel concentration up to 375 ppm. These results may be due to the effect of ethrel on ripening metabolism .

Table 1. Effect of ethrel treatments on fresh weights of sepals per plant and per plot in 1988 and 1989.

Ethrel ppm.	Fresh weight of sepals per plant (g)		Fresh weight of sepals per plot (kg)	
	1988	1989	1988	1989
0.0	40.0	42.27	2.800	0.990
125	156.0	55.60	3.050	1.110
375	188.3	49.38	3.700	0.890
L. S. D. at 0.05	12.10	3.22	0.20	0.09

Table 2. Effect of ethrel treatments on dry weight of sepals per plant and per plot in 1988 and 1989.

Ethrel ppm.	Dry weight of sepals per plant (g)		Dry weight of sepals per plot (g)	
	1988	1989	1988	1989
0.0	17.770	5.150	345.400	102.900
125	28.340	7.100	566.800	141.900
375	23.720	5.830	570.400	116.500
L. S. D. at 0.05	0.91	0.17	18.10	3.30

Table 3. Effect of ethrel treatments on total organic acid and anthocyanin in dry sepals.

Ethrel ppm.	Organic acid %		Anthocyanine mg/100 g	
	1988	1989	1988	1989
0.0	4.00	4.00	1431.10	1475.80
125	5.90	5.90	1475.80	1722.10
375	6.36	6.33	1721.80	1822.50
L. S. D. at 0.05	0.13	0.11	21.10	25.20

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تأثير المعاملة بالإثريل على المحصول والتركيب الكيماوى فى الكركديه

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تم دراسة تأثير المعاملة بالأثريل على نبات الكركديه خلال عامى ١٩٨٨ ١٩٨٩ م وذلك بمزرعة محطة بحوث البساتين بسدس – محافظة بنى سويف ، واستخدم فى هذه الدراسة ٣ معدلات من الأثريل هى صفر، ١٢٥ ، ٣٧٥ جزء فى المليون حيث أضيفت هذه المعدلات رشا على المجموع الخضرى.

وقد أوضحت النتائج لاستخدام الأثريل إلى : –

١ – زيادة فى الوزن الطازج والوزن الجاف للسبلات بالنسبة للنبات والقطعة التجريبية .

٢ – زيادة معنوية فى الأحماض العضوية الذاتية فى السبلات .

٣ – زيادة معنوية فى مادة الأنثوسيانين فى السبلات.