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EFFECT OF ETHREL AND CYCOCEL ON YIELD COMPONENTS OF CASSAVA

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ABSTRACT

The effect of ethrel and cycocel each at three concentrations on the yield component of cassava varieties reveals that the total number of roots per plant was significantly influenced by CCC 5000 ppm and the same was more pronounced at the peak bulking phase. Among the varieties, Co.1 recorded a greater number of roots. The number of tuberous roots was more under the treatment ethrel 250 ppm and the variety Co.1 had the highest root number. The yield of tubers was significantly influenced by CCC, 10,000 ppm and the variety Co.1 recorded the highest yield.

KEY WORDS : Total number of roots, peak bulking, tuberous roots, yield components

A study of yield components in cassava could go a long way in increasing its productivity. Among the components, number of tubers, weight of tubers and girth of tubers are considered important. According to Jennings (1970), the number and size of tuber, the size and efficiency of the leaf canopy, the ratio of top/root and the duration of the period of dormancy are the yield components. Magoon *et al.* (1970) correlated the total yield with number of tubers per plant, tuber length, tuber circumference rind thickness and height of the plant. The storage root formation and development has been described in quantitative terms by many. Here an attempt was made to study the effect of growth substance on the yield components namely the number of total roots, tuberous roots and tuber yield.

MATERIALS AND METHODS

Studies were undertaken at the Horticultural College and Research Institute, Tamil Nadu Agricultural University, Coimbatore during 1983-86 with two varieties of cassava namely Co.1 and MVD.1 along with a promising culture ME.116. Growth substance ethrel and CCC were applied each at three concentrations begining from one month after planting at fortnightly intervals.

Main Plot Treatment

T1 Ethrel 250 ppm

T2 Ethrel 500 ppm

T3 Ethrel 1000 ppm

T4 CCC 2000 ppm

T5 CCC 5000 ppm

T6 CCC 10,000 ppm

T7 Water spray

T8 Control

Sub Plot

V1. Co.1

V2. ME 116

V3. MVD.1

Table 1. Total number of roots, tuberous roots at different stages of plant growth

Treatment	Total number of roots								Total number of tuberous roots							
	S3	S4	S5	S6	S7	S8	S9	S10	S3	S4	S5	S6	S7	S8	S9	S10
Treatment mean																
T1 Ethrel 250 ppm	19.05	16.15	19.76	17.28	14.68	13.20	12.82	13.83	6.97	8.47	12.53	10.42	8.09	8.11	8.98	9.20
T2 Ethrel 500 ppm	20.98	15.72	16.09	19.20	14.86	15.64	12.05	12.78	6.87	7.86	7.40	9.84	7.84	7.84	8.67	7.65
T3 Ethrel 1000 ppm	18.40	15.41	15.96	17.42	15.65	16.09	10.85	12.41	5.54	9.58	8.11	9.31	7.42	9.89	7.66	7.53
T4 Cycocel 2000 ppm	21.04	15.39	15.61	17.30	14.74	14.21	11.63	12.72	5.61	7.76	7.76	8.98	9.06	0.20	7.98	7.09
T5 Cycocel 5000 ppm	18.50	16.41	12.04	13.52	18.75	17.53	12.84	12.66	4.32	9.38	6.05	8.09	10.21	8.21	8.99	7.16
T6 Cycocel 10000 ppm	19.68	16.29	14.49	16.65	13.87	14.66	11.84	12.18	6.10	9.20	8.18	8.12	7.11	7.87	9.09	7.76
T7 Water spray	20.83	18.40	18.62	16.35	15.16	14.21	11.98	13.89	6.00	9.09	8.40	10.40	8.55	7.45	9.33	8.32
T8 No spray (control)	21.48	17.01	14.49	18.22	13.63	13.97	9.98	13.66	6.87	8.96	5.76	9.08	8.11	8.32	6.88	8.83
Variety mean																
V1 Co.1	21.66	16.61	15.97	18.52	15.64	15.85	14.30	15.74	5.69	8.80	8.39	10.02	8.77	9.13	9.66	9.14
V2 ME.116	20.14	20.05	19.04	15.87	16.50	14.45	12.02	12.74	7.15	11.58	10.62	10.03	10.37	7.65	9.58	8.81
V3 MVD.1	18.19	12.30	12.64	16.59	13.14	14.51	8.92	10.58	5.27	6.03	5.06	7.76	6.20	6.69	6.09	5.88
Treatment																
SEd	0.82	1.22	1.04	0.81	0.83	0.75	0.70	0.47	0.36	0.43	0.42	0.40	0.40	0.40	0.33	0.36
CD	1.77*	2.62*	2.24*	1.74*	1.78*	1.57*	1.50*	1.00*	0.73*	0.92*	0.89*	0.86*	0.86*	0.87*	0.71*	0.78*
Variety																
SEd	0.63	0.62	0.73	0.50	0.54	0.51	0.49	0.56	0.18	0.44	0.43	0.26	0.32	0.24	0.24	0.26
CD	1.23*	1.27*	1.49*	1.09*	1.10*	1.04	1.00*	1.14*	0.37*	0.90**	0.87*	0.53*	0.65*	0.69*	0.48*	0.53*

* Significant at 5% level ** Significant at 1% level S3-S10 = Stages in months

Totally ten sprayings were given. Observation on the yield components namely total number of roots, number of tuberous roots, and tuber yield were studied.

RESULTS AND DISCUSSION

The total number of roots per plant was significantly influenced by CCC 5000 ppm. Among the varieties, Co.1 recorded more number of roots (Table 1). The total root number and the peak bulking phase had significant positive correlation with the yield. The induction of more number of roots in the present study due to CCC application may be due to increase in the level of photosynthetic activity and would have enhanced root growth as observed by Jung (1967) in sweet potato.

Table 2. Yield (g/plant) at different stages of plant growth

	Total number of roots							
	S3	S4	S5	S6	S7	S8	S9	S10
Treatment mean								
T1 Ethrel 250 ppm	55.32	278.33	674.33	750.00	1305.67	1466.67	1855.67	1989.00
T2 Ethrel 500 ppm	23.67	160.00	227.33	816.64	1272.00	1494.32	1650.00	2033.33
T3 Ethrel 1000 ppm	24.66	133.67	344.65	689.00	1038.67	1333.00	1811.00	1906.00
T4 Cycocel 2000 ppm	39.65	165.67	485.67	860.67	1433.32	1496.89	1740.00	1533.33
T5 Cycocel 5000 ppm	29.00	184.32	420.89	668.66	1271.94	1533.32	1878.00	2078.00
T6 Cycocel 10000 ppm	25.33	214.33	391.00	866.33	989.00	1727.67	1927.67	2222.33
T7 Water spray	25.00	123.32	196.00	322.00	800.00	1016.66	1415.56	1523.67
T8 No spray (control)	27.00	134.33	182.00	369.00	774.33	1058.67	1205.00	1460.00
Variety mean								
V1 Co.1	46.13	195.25	506.86	673.63	1179.60	1666.62	2158.08	2129.63
V2 ME.116	22.12	207.38	401.58	769.74	1206.25	1482.83	1557.13	1955.13
V3 MVD.1	25.38	120.13	206.00	560.00	946.00	1023.25	1340.88	1444.88
Treatment								
SEd	0.89	3.39	2.75	2.14	10.08	10.22	16.82	7.23
CD	1.91*	7.28*	5.90*	4.58*	21.61*	21.93**	36.08**	15.50**
Variety								
SEd	0.50	1.49	3.04	2.08	7.56	5.11	9.78	6.19
CD	1.00*	3.00*	6.20*	4.23*	15.38*	10.41**	19.91**	12.60**

* Significant at 5% level ** Significant at 1% level S3-S10 = Stages in months

The number of tuberous root was more with the treatment ethrel 250 ppm and the variety Co.1 had the highest root number. The influence of ethrel in increasing the number of tuberous roots may be due to its effect on tuberisation. According to Hunt *et al.* (1977) the first sign of storage root formation is generally manifested when cambial activity causes the stele enlarge during the first month of growth of a plant regenerating from stem cuttings. Garcia and Gomez (1972), observed increased rate of tuberisation as a result of ethrel with higher rate of cell division leading to early tuberisation. The highest yield was met with CCC 10,000 ppm in Co.1 variety (Table 2). Higher yield in the present study following CCC treatment is due to rapid proliferation of xylem parenchyma in the tubers leading to formation of storage roots earlier and also in greater number. Further in the study, early formation of tubers and translocation of large amount of carbohydrates from leaf and stem to storage roots through CCC application was observed. Dyson (1972) observed similar findings in potato with CCC which caused earlier formation of more uniform tubers and diverted large proportion of photosynthates to tuber growth.

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EFFECT OF ZINC, IRON AND MANGANESE ON YIELD AND QUALITY OF SWEET ORANGE CV. SATHGUDI

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ABSTRACT

An experiment was undertaken during 1993-94 in six years old micronutrient deficient chlorotic sweet orange cv. Sathgudi trees to find out the effect of soil, foliar and soil + foliar application of zinc sulphate, ferrous sulphate and manganese sulphate on yield and quality of fruits. The study revealed that the soil application of 50g/plant each of zinc sulphate, ferrous sulphate and manganese sulphate combined with foliar sprays of 0.5 per cent each of the above nutrients resulted in increased fruit yield, TSS, total sugars, ascorbic acid, juice content, reduced peel content, rind thickness and acidity.

KEY WORDS : Sathgudi, zinc, iron and manganese, TSS, acidity.

Micronutrient deficiencies are very common in citrus orchards in general and sweet oranges in particular. The sweet orange cv. Sathgudi has been cultivated both as an inter crop in coffee plantations in hills and as sole crop in plains of southern India. Micronutrient defiencies cause severe reduction in growth, yield and quality of the fruits. Earlier investigations in sweet orange revealed that the micronutrient deficiencies were due to zinc, iron and manganase in Ludhiana (Kanwar *et al.*, 1963) and zinc alone in Himachal Pradesh (Chadha *et al.*, 1970). However, no such studies have been conducted in sweet orange cv. Sathgudi. Hence, the present study was carried out to find out the effect of zinc, manganese and iron on the yield and quality of Sathgudi orange.