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MANAGEMENT OF SUGARCANE UNDER MOISTURE STRESS CONDITIONS

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ABSTRACT

A field experiment was conducted at Tamil Nadu Agricultural University Sugarcane Research Station, Sirugamani to evolve suitable agrotechnology to manage the sugarcane crop grown under moisture stress condition during 1983-84 in clay loam soil. The results of the experiment revealed that the application of Nitrogen and Potassium in three splits viz., 30, 60 and 90th days after planting was beneficial for cane yield. Net return/ha can be increased either by set treatment with ethrel 200 ppm or by foliar application of potassium at 120th and 135th day after plating under moisture stress conditions.

In the deltaic regions of the Tamil Nadu, every year irrigation canals are closed for desilting, strengthening of embankments etc., during May-July and

again water is let in during the last week of July. The sugarcane crop raised in the main season suffers from moisture stress due to this closure of canals. Lift

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irrigation facilities are not available in deltaic regions and there is no possibility for supplemental irrigation also. The cane and sugar yields and quality characters are affected due to low rate of tiller production, high mortality of tillers, constricted internodes and pith formation under moisture stress condition. Hence the study was undertaken to evolve suitable agronomic measures to manage the sugarcane crop under moisture stress condition for higher yields.

MATERIALS AND METHODS

A field experiment was conducted at Sugarcane Research Station, Sirugamani in 1984. The soil was clay loam, low in available nitrogen (165 kg N/ha), medium in phosphorous (12.3 kg P₂O₅/ha) and high in potassium (288 kg K₂O/ha). Application of fertilizers in three and four splits along with ten management practices as indicated in Table 2 were tried. Split plot design was adopted with two times of fertilizer application (three and four splits) in main plots and ten management practices in sub-plots. CoC1671 was the test variety in this study. A basal dose of 62.5 kg P₂O₅/ha he was uniformly applied for all treatments at the time of planting.

RESULTS AND DISCUSSION

The results indicated that the application of N and K in three splits viz., at 30, 60 and 90 days after recorded numerically higher tiller production, girth of cane, millable canes, can yield and quality characters (Table 1), than the four splits viz., at 30, 60, 90 and 150

days after planting. Favourable influence on these components by the three splits could be attributed to efficient utilisation of nutrients by the crop during the early stages. These observations are in accordance with the findings of Kannappan (1982).

The set treatment with ethrel solution at 200 ppm increased the germination, tiller production, maximum cane formed shoots, yield components such as millable canes, cane and sugar yields and quality characters (Table 2). Srinivasan and Mohan Naidu (1980) and Nickell (1982) reported stimulating effect of ethrel on peroxidase enzyme activity in the plant tissue consequent on the destruction of auxin, there by enhancing early and higher tiller production, which in turn increased the survival percentage of millable canes and final cane yield.

Urea and potassium spray was found to be on par with ethrel treatment. Spraying of urea with potash gave the maximum can yield (113.1 t/ha) which was superior to Kaolin (108.1 t/ha) water spray (103.1 t/ha) which was superior to Kaolin (103.1 t/ha) and control (101.0 t/ha) Potassium has been reported to control the movement of water from leave and maintains water balance in the plant by better absorption of nutrients through leaves and stomata particularly under moisture stress (Perumal and Pasupathi 1984 and Sexane 1985. Urea enhances the absorption of potassium in to leaf tissue there by cause beneficial influence on shoot population and final production.

TABLE 2 : Effect of set treatment, foliar nutrition and cultural practices on growth, yield components and yield.

Treatments	Germina tion %	No. of tillers (000/ha)	Cane formed shoots (000/ha)	No. of millable canes (000/ha)	Cane yield (t/ha)	Sugar yield (t/ha)	CCS %	Reducing Sugar %	Net profit (Rs./ha)
Clipping of terminal leaves on 105th day after planting	61.4	190	110	91	104.62	15.84	14.68	0.67	10973
Trash mulching (7.0 t/ha) on 105th day after planting.	61.2	191	113	94	106.08	15.21	14.35	0.71	11212
Soil application extra dose of Potassium (75 kg K ₂ O/ha) on 105th day after planting.	61.3	192	116	94	105.12	15.59	14.84	0.65	11081
Kaolin spray (12.5 kg/ha in 500 lit. of water on 120th and 135th day after planting.	60.8	191	116	95	108.05	16.04	14.86	0.66	11781
Urea and Potassium spray (12.5 kg/ha each in 500 lit of water) on 120th and 135th day after planting.	60.5	192	122	101	113.06	16.62	14.71	0.65	12879
Soaking sets in lime water (80 kg of kil in lime dissolved in 400 lit of water for one hour before planting.	61.4	200	120	95	110.23	16.65	15.11	0.64	12285
Soaking sets in ethrel solution (2 chlore ethyl phosphonic acid) 200 ppm for one hour before planting.	62.4	207	132	104	113.76	16.84	14.81	0.66	13126
Soaking sets in cycocel solution 200 ppm for one hour before planting.	61.9	195	118	92	104.91	15.57	14.85	0.66	11165
Water spray (500 lt/ha) on 120th and 135th day after planting.	60.5	192	111	94	103.84	15.23	14.68	0.67	10933
Control	60.9	192	110	88	101.00	14.68	14.53	0.70	10384
SEd	0.496	0.041	3.355	2.482	1.252	0.199	0.057	0.10	
CD	NS	0.082	6.810	5.040	2.550	0.400	0.120	0.02	

Taking all the growth, yield, quality characters of cane and net return into consideration, it can be stated that application of nitrogen and potassium in three splits viz., 30, 60 and 90 days after planting was more beneficial. Considering the maximum percentage of germination, greater number of tillers, least mortality of tillers, optimum millable canes, increased can and sugar

yields and quality characters etc., increased cane and sugar yields and quality characters etc., either set treatment with ethrel solution (200 ppm) or urea and potash spray at 120th and 135th day after planting can be recommended under moisture stress conditions, caused consequent on the closure of canals in Cauvery deltaic regions during formative and early growth phases.

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RESEARCH NOTES

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BIOCHEMICAL STUDIES OF COCONUT MEAT FROM PALMS AFFECTED BY VARYING INTENSITY OF ROOT (WILT) DISEASE

Root (wilt) disease is a major malady affecting coconut palms in Kerala. It reduces the yield and life span of the palm considerably. Studies on the nutritional status of leaves of the affected palms have been made by R. Cecil

(1975) and Varkey et al. (1969). The results of study on some of the quality attributes of coconut meat is presented here.

Coconut palms of cv. WCT of about 45 years old were selected and grouped