proliferation. Similar results were also reported by Vijayalakshmi and Aruna Rajagopal (1994). The more available soil moisture before and after irrigation was in 0.60 IW/CPE ration than in 0.40 IW/CPE ratio (Table 2) might be due to more frequent irrigation. This was evident that such increase in available soil moisture had favoured the growth, yield attributes and yield of soybean at 0.60 IW/CPE ratio. Lower available soil moisture as in 0.40 IW/CPE ratio in turn affected the uptake of nutrients, translocation of assimilates from source to sink and other physiological and bio-chemical processes.

Alternate furrow had lesser ASM than all furrow method, which might be due to lesser quantity of water applied in alternate furrow than in all furrow method. The difference in ASM between all furrow and alternate furrow was 14.8 per cent whereas the same under coir waste applied treatment was 6.5 per cent.

Application of coirpith at 12.5 t ha^{-1} had maintained higher available soil moisture (Table 3) due to its higher water holding capacity and therefore. application of kaolin and KCI as foliar spray, did not have much influence on ASM which is in confirmation with the report of Dhanabalan (1994).

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A study on the soil fertility status of sugarcane growing areas of Kancheepuram district, Tamil Nadu

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Abstract : A study was carried out to assess the available macro and micronutrient status of sugarcane growing soils of Uttiramerur taluk of Kancheepuram district, Tamil Nadu. The available nitrogen content was low in 96 per cent of the surface and 98 per cent of the subsurface soil samples. The available phosphorus was low in 50 per cent of the surface and 61 per cent of the subsurface soil samples and medium in 27 per cent of the surface and 21 per cent of the subsurface soil samples and high in 23 per cent of the surface and 18 per cent of the subsurface soil samples. Forty five per cent of surface and 68 per cent of subsurface soil sample were low, 51 per cent of surface and 28 subsurface soil samples were medium and the remaining were high in available potassium. The micronutrient content of the soil samples showed that the DTPA Fe was sufficient in 98 per cent of the surface and 91 per cent of the subsurface soil samples. DTPA Mn was sufficient in 73 per cent of surface and 96 per cent of subsurface soil samples. DTPA Zn was deficient in 91 per cent of surface and 99 per cent of subsurface soil samples. DTPA Cu was sufficient in 57 per cent of surface and 40 per cent of subsurface soil samples. Hot water soluble B was found sufficient in 84 per cent of the surface soil samples. *(Key words : Available nutrients, Surface, Subsurface, Sugarcane.)*

The importance of soil fertility is increasingly recognised in all countries especially in developing countries, which have a high pressure of population on the land. Universal deficiency of nitrogen, serious

deficiency of phosphorus and potassium and the increasing deficiency of micronutrients, particularly zinc has focused the attention on soil fertility. Though cane yield is the result of a large number of simultaneous growth factors, the nutritional factors are prime important.

Sugarcane is an important commercial crop cultivated in tropics and subtropics of the world. It is cultivated in 3.26 lakh ha in Tamil Nadu. Since sugarcane is a crop which produces maximum biomass and makes the best use of sunlight and responds considerably to good management practices and inputs, the fertility of the soil has to be maintained. Recent researchers have noticed that sugarcane crop requires micronutrients for sugar synthesis and accumulation and for enzyme activity (Bhanavase *et al.* 1996). Hence, an attempt has been made to study the available macro, secondary and micronutrient status of soils of sugarcane growing areas of Uttiramerur Taluk, Kancheepuram District.

Materials and Methods

The study area covers about 23,808 hectares distributed in three cane divisions *viz.*, Mill site, Seethancheri and Uttiramerur of Uttiramerur taluk, Kancheepuram District, Tamil Nadu. Uttiramerur taluk consist of 121 revenue village and sugarcane is being cultivated in 59 villages. The survey of India Topo sheets and taluk maps showing revenue village boundaries were used for reference and the lands cultivated to sugarcane were located. Surface and subsurface soil samples of each village were collected for assessing the available nutrient status. The soil samples were processed and analysed for available macro, secondary and micronutrients. The available nitrogen content was determined by Alkaline - KMnO4 method (Subbaiah and Asija, 1956). The available phosphorus content was determined as per Olsen *et al.* (1954). The available potassium content was estimated by flame photometry (Stanford and English, 1949). Available sulphur was determined by turbidimetrically as per Tandon (1995). The available micronutrients *viz.*, Fe, Zn, Cu and Mu were determined as per the method described by Lindsay and Norvel (1978). The available B was determined colorimetrically using Azomethane - H reagent (Tandon, 1995)

Results and Discussion

The KMnO4-N content of surface and subsurface soil samples of the three cane divisions was low to medium. The subsurface soil samples of Seethancheri and Uttiramerur cane divisions were deficient in nitrogen than subsurface soil samples. The low available nitrogen status in the soils was due to low organic carbon and low nitrogen supplying capacity of the soils. The Olsen P content of majority of the surface and subsurface soil samples of the three cane divisions was low. The subsurface soil samples under low category was higher than that of surface soil samples. However the available phosphorus was medium to high in some specific locations of the study area. The NH_4OAc K was low in surface and subsurface soil samples of Mill site and medium in surface soil samples of Seethancheri and Uttiramerur cane divisions and low in subsurface soil samples of these cane divisions. It was also noticed that many of the sandy textured soils registered low available potassium due to low exchangeable potassium content. The available sulphur content of all the cane divisions of present study indicated the sufficiency level of available sulphur in soils. Mehta *et al.* (1988) reported that soils with <10 mg kg^{-1}-S will respond to sulphur fertilization.

The critical limits of DTPA extractable Fe, Mn, Zn and Cu and hot water soluble B are 3.7, 2.0, 1.2, 1.2 and 0.46 mg kg^{-1} respectively (Devarajan and Ramanathan, 1991). The DTPA Fe was sufficient in all surface and subsurface soil samples of Millsite and Seethancheeri cane divisions except a single location in subsurface soil sample. All the surface soil samples of Uttiramerur except one sample were sufficient in DTPA Fe. Few locations registered deficiency in subsurface soil samples of Uttiramerur. Majority of the locations of Millsite and Seethancheri cane divisions registered sufficiency level of DTPA Mn. Thirty six per cent of soil samples of Uttiramerur cane division showed deficiency of DTPA Mn which will respond to Mn fertilization.

DTPA Zn was deficient in all the locations of the cane divisions except few locations in Millsite and Seeethancheri. Application of zinc to the soils is essential for getting higher yield and to maintain

Table 1. Available macro and secondary nutrient status of surface and subsurface soil samples

Surface/ subsurface	Status	$KMnO_4$ N		Olsen P		NHOAc K		$CaCl_2$ S
		Frequency	%	Frequency	%	Frequency	%	Sufficient/ Deficient
				Millsite				
Surface	Low	12	85.71	8	57.14	9	64.29	
	Medium	2	14.29	2	14.29	4	28.57	Sufficient
	High	-	-	4	28.57	1	7.14	
Subsurface	Low	12	85.71	9	64.29	11	78.57	
	Medium	2	14.29	2	14.29	3	21.43	Sufficient
	High	-	-	3	21.42	-	-	
				Seethancheri				
Surface	Low	24	96.00	8	32.00	8	32.00	
	Medium	1	4.00	8	32.00	14	56.00	Sufficient
	High	-	-	9	36.00	3	12.00	
Subsurface	Low	25	100.0 0	12	48.00	14	56.00	
	Medium	-	-	9	36.00	9	36.00	Sufficient
	High	-	-	4	16.00	2	8.00	
				Uttiramerur				
Surface	Low	55	98.21	31	55.36	26	46.43	
	Medium	1	1.79	16	28.57	30	53.57	Sufficient
	High	-	-	9	16.07	-	-	
Subsurface	Low	56	100.0 0	37	66.07	40	71.43	
	Medium	-	-	9	16.07	15	26.79	Sufficient
	High	-	-	10	17.86	1	1.79	

Table 1. Available macro and secondary nutrient status of surface and subsurface soil samples

Surface/ subsurface	Status	DTPA-Fe		DTPA-Mn		DTPA-Zn		DTPA-Cu		Hot water-B	
		Frequ- ency	%	Frequ- ency	%	Frequ- ency	%	Frequ- ency	%	Frequ- ency	%
					Millsite						
Surface	Sufficient	14	100	13	92.86	4	28.57	8	57.14	11	78.57
	Deficient	-	-	1	7.14	10	71.43	6	48.86	3	21.43
Subsurface	Sufficient	14	100	14	100	-	-	7	50	-	-
	Deficient	-	-	-	-	14	100	7	50	-	-
					Seethancheri						
Surface	Sufficient	24	96	20	80	5	20	20	80	20	80
	Deficient	1	4	5	20	20	80	5	20	5	20
Subsurface	Sufficient	25	100	25	100	-	-	19	76	-	-
	Deficient	-	-	-	-	25	100	6	24	-	-
					Uttiramerur						
Surface	Sufficient	55	98.21	36	64.29	-	-	26	46.43	49	87.5
	Deficient	1	1.79	20	35.71	56	100	30	53.57	7	12.5
Subsurface	Sufficient	47	33.93	52	92.86	1	1.79	12	21.43	-	-
	Deficient	9	16.07	4	7.14	55	98.21	44	78.57	-	-

soil fertility in these locations. DTPA Cu was deficient in Millsite and Uttiramerur cane divisions. Copper was found be sufficient in most of the locations of the Seethancheri division. Boron was found to be sufficient in majority of the locations.

From the above study, it cane be concluded that the sugarcane growing soils of Uttiramerur taluk of Kancheepuram district are low in nitrogen and medium in phosphorus. The available potassium was low in sandy textured soils. The available sulphur was sufficient in all the cane divisions. Zinc was deficient in all the cane divisions. In few locations boron was found to be deficient. The areas deficient in nutrients have to be supplied with adequate nutrients to increase to cane yield.

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