Agri. Res. J. *Kerala*, 1974 *12* (1)

INFLUENCE OF SPACING ON THE GROWTH AND YIELD OF SIX TAPIOCA VARIETIES

Tapioca (*Manihot esculenta Crantz*) is well known as an industrial-cum-food crop, whose cultivation is becoming very popular in view of the present day food scarcity. Among the factors that influence the yield, spacing between plants play an important role. Hence the present study was undertaken to investigate the influence of spacing on the growth and yield of tapioca. The effects of spacing was studied employing 6 popular types of tapioca viz., Malavella (M. E. 4), Musiri (M. E. 7), Hybrid 1 (M. E, 49), Selection 5 (M. E. 15), Vella (M. E. 3) and Malayan 4 (M. E. 1). The experiment included three spacing treatments viz., 75x60 cm (S_1), 75x75 cm (S_2), and 75x90 cm (S_3) with 21518, 17216 and 14346 plants/ha respectively. Spacing between plants were constant (75 cm) while the spacing between rows were only changed as per the above treatments. The trial was conducted for two seasons adopting a split plot design with a plot size of 3×6 3 metres. All the other cultural operations were done uniformly and data were recorded on the final height of the plants and the yield of tubers by weight. The data were statistically analysed and are presented in Table 1.

It is evident from Table 1, that the differences in height due to the spacing and the Varieties were not significant. But the yield differences were highly significant indicating varying responses between varieties for the spacing treatments The varieties Malavella, S.5 and M 4 responded for a wider spacing (75×90 cm) while the Musiri, H1 and vella registered greater yields under a medium spacing viz., 75 x 75 cm. Closer spacing (60×75 cm) recorded reduced yields in all the varieties under study.

The varietal difference to the spacing may be attributed to the genetic variation in the vegetative growth and the resulting foliage production. This is in line with the observations of Enyi (1973), who has reported that optimum plant density varies depending upon the foliage of the varieties. The three varieties viz. Malavella, S.5 and M.4 are inherently more leafy in growth and are branching types. This should have been the reason for their wider requirement of space. The other types are noted for their limited top growth and hence a lesser spacing is sufficient for normal production. This indicates that the varieties require spacing based on their top growth.

It is also interesting to. note a distinct reduction of yield in the closer spacing treatments. This is due to the increase in plant density over the optimal, which may subsequently reduce the proportion of total dry matter diverted

Table 1

Effect of spacing on the growth and yield

Name of the varieties	Yield tonns/ha				Plant height at harvest			
	S_1	S_2	S_3	Mean	S_1	S_2	S_3	Mean
Malavella	21.9	25.7	27.6	25.1	210	197	208	205
Musiri	27.2	29.7	26.1	27.0	241	220	237	233
H.1	18.9	22.3	15.3	15.5	162	124	146	144
S.5	27.3	27,7	29.5	28.2	196	175	194	188
Vella	15.0	22.0	20.1	19,0	240	209	229	226
M. 4.	15.6	16,2	22.0	17.9	328	310	320	319
Mean	20.9	23.9	23.4	—	229	206	222	—
CD (P = 0 05)								
Between varieties		3.74				NS		
Between spacing		3,48				NS		

into the root tubers. According to Enyi (1973), as the spacing increases, there is corresponding increases in mean growth rate coupled with a reduction in net assimilation rate. This trend was linear upto a specific range of population i. e., 9000 to 12000 plants/ha under Malayan conditions. Similar trend under Indian conditions could also be fixed based on the present study. The optimum plant density for economic yield may vary between 14000 to 17000 plants/ha as the yield maximization was more only in these population densities.

ttUc(O)aDo

ആറിനം മരച്ചീനി ചെടികൾ പല raracflseJKJsgTaA നട്ടുനോക്കിയതിൽ ചെടികൾ തമ്മിലുള്ള അകലം വിളവിനെ സാരമായി ബാധിച്ചതായി കണ്ടു. മലവെള്ള, S5, M4 എന്നീ ഇനങ്ങൾ 75x90 സെ. മീ. അകലത്തിൽ നട്ടതു് നല്ലതായി കണ്ടപ്പോൾ H1, വെള്ള എന്നീ ഇനങ്ങൾ 75 × 75 സെ. മീ. അകലത്തിൽ നട്ടതാണു ഉത്തമമെന്നു തെളിഞ്ഞു. ഒരു ഹെക്ടറിനു് 15,000 മുതൽ 17,000 വരെ ചെടികൾ ഉണ്ടായിരിക്കുന്നതാണു് കൂടുതൽ വിളവുകിട്ടാൻ ഉത്തമം.

"REFERENCES

Enyi, 6, A. C. 1973. Growth rate of three cassava varieties (*Manihot esculenta* Crantz) under varying population densities. *J. Agric. Camb.* **81**, 15-28

Tamil Nadu Agrl. University,
Coimbatore. 641003.

A. SHANMUGAM

(M. S. *received*: 28-8-1974)