

CANOPY SPREAD OF AND LIGHT INFILTRATION THROUGH CASSAVA (*Manihot esculenta* Crantz) CANOPIES

Feasibility of cultivating short-statured intercrops along with cassava in the early growth period has been tested experimentally and several short-season rainfed legumes have been recommended for intercropping (Singh and Mandal, 1968; Mohankumar and Hrishi, 1978, Thomas *et al.* 1982). While this practice has been considered economically feasible, the general observation had been one of yield suppression of intercropped legumes. Kawano and Thung (1982) reported that cassava can be planted in association with short duration crops and that cassava genotypes of less vegetative vigour should be preferred for such associations. The major factor for this is considered to be the competition for light. The present study was taken up to estimate the extent of canopy spread of and light infiltration through cassava canopy with advancing age. These observations were recorded in six varieties of cassava mound-planted at a spacing of 90 cm x 90 cm. The varieties were M4, H 1687, H 2304, H 3641, H 312 and Co1. The mean canopy diameter worked out from measurements in the north-south and east-west directions was taken as the measure of canopy spread. Light infiltration through the canopy was recorded in two positions at ground level-over the mounds and in the remaining part of the interspace. A mean of 10 observations recorded from random locations constituted each light infiltration value given. Both these were recorded 45, 75, 90 and 120 days after planting. In the case of canopy spread, an additional observation was taken at harvest. Light intensities were measured using an Aplab lux meter.

Data on canopy spread presented in Table 1 would show that it rose from a mean of 66.5 cm to 114.2 cm from 45 days after planting to harvest. The varietal differences were not significant at any of the stages. Over the stages, extent of lateral canopy spread was the highest from 45th day. Beyond this stage, there was no appreciable increase. The mean values also would indicate that the cassava canopies meet between the 45th and 75th days and that with advancing age, there is substantial canopy overlapping.

Tallying with the rate of increase in canopy spread, there was conspicuous decrease in light infiltration both over the mound area and in the rest of the interspace. The overall mean infiltration percentage over the mound 45 days after planting was 39.1 which decreased to 26.5 per cent 75 days after planting and then finally to 18 per cent 120 days after. In the rest of the interspace, there was no shading at the first stage of 45 days, the mean percentage infiltration at the next stages of observation being 49, 36.4 and 26.1, respectively. Unlike in the case of canopy spread, varietal differences were significant in percentage infiltration of light. M4, a non-branching variety, allowed consistently more light transmission followed by Co1. The hybrids gave lower light infiltration at all stages both over the mounds and in the rest of interspaces. The total number of leaves was maximum in H 2304 at 120 days stage.

A comparison of values obtained at the two locations would show that substantially less of light falls over the mounds and the values over the mounds 45 days after planting are almost comparable to the light intensity in the rest of interspace 75 days after planting. Distinct advantage of sowing intercrops farther from mounds is thus indicated. There would be substantial cutting off of light in the period from 45 to 75 days and the extent of attenuation of light would increase with further advance in cassava growth.

Table 1
The spread of canopy (cm) at different stages of growth

Varieties	Days after planting				
	45	75	90	120	270
M 4	70.7	90.7	101.5	108.7	109.0
H 1687	66.4	98.7	111.9	115.3	115.8
H 2304	69.4	105.9	117.4	118.5	118.6
H 3641	69.9	92.5	112.2	116.6	117.0
H 312	61.8	101.0	107.5	113.8	114.2
Co 1	60.7	100.9	107.0	109.7	110.3
Mean	66.5	98.3	109.6	113.8	114.2
C.D.(0.05)	N.S	N.S	N.S	N.S	N.S
SEM ₊	4.2	4.7	6.3	5.9	5.8

Table 2
Percentage light infiltration through the canopy at different growth stages

Varieties	Over the mound (30 cm)				Interspaces (45 cm)			
	Days after planting				Days after planting			
	45	75	90	120	45	75	90	120
M 4	51.6	33.7	31.1	31.3	100	53.3	48.5	42.0
H 1687	50.0	22.0	22.0	14.5	100	48.6	39.0	28.2
H 2304	39.6	17.0	8.6	8.2	100	36.8	21.5	16.5
H 3641	46.2	22.8	20.5	12.9	100	46.7	30.5	18.0
H 312	47.1	32.7	18.9	17.8	100	52.0	41.9	21.3
Co 1	54.7	30.5	26.3	23.2	100	56.3	36.9	30.3
Mean	39.1	26.5	21.2	18.0	100	49.0	36.4	26.1
C.D. (0.05)	—	16.2	8.7	0.9	—	—	19.4	—
SEM ₊	4.2	5.4	2.9	0.3	—	6.5	6.4	0.4

Table 3
Total number of leaves at different stages

Varieties	Days after planting				
	45	75	90	120	270
M 4	26.1	61.4	85.5	98.0	155
H 1687	28.6	62.7	74.0	96.7	148
H 2304	29.0	60.3	94.0	144.6	165
H 3641	26.3	55.7	74.8	117.8	145
H 312	24.6	49.8	83.0	97.3	146
Co 1	24.6	59.8	92.0	106.9	123
C. D. (0.05)	—	—	—	45.4	12.0
SEM +	2.0	3.4	7.7	15.1	4.0

സംഗ്രഹം

വിവിധ ഇനം മരച്ചീനിയുടെ മേൽവിതാനിയുടെ വളർച്ചയും അവയിൽ കൃഷി ചെയ്തുകൊടുക്കുന്ന ഇടയിൽ പതിക്കുന്ന സൂര്യരശ്മിയുടെ തോതും പാനവിധേയമാക്കി. മരച്ചീനിയുടെ മേൽവിതാനി 45 മുതൽ 75 ദിവസത്തിനകം പൂർണ്ണ വൃശം പ്രാപിക്കുമെന്ന് കണ്ടു. ചെയ്തുകൊടുക്കുന്ന ഇടയിലേക്ക് അരിച്ചിറങ്ങുന്ന സൂര്യരശ്മിയുടെ തോത് സങ്കരയിനങ്ങളിൽ മറ്റിനങ്ങളേക്കാൾ കുറവായിരുന്നു. മരച്ചീനി നട്ടിരിക്കുന്ന കൃഷിയിൽ ലഭിക്കുന്ന സൂര്യപ്രകാശം പരിമിതമായതിനാൽ കൃഷിക്കർഷിയ്ക്കുന്ന ഇടയിലുള്ള സമൃദ്ധത്വം ഇടവിളകൾ നടയ്ക്കുന്നതായിരിക്കും അഭികാമ്യം.

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