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EFFECT OF SOWING DATES ON YIELD ON YIELD COMPONENTS IN PIGEONPEA

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ABSTRACT

Experiment conducted with pigeonpea (Cajanus cajan (L) Millsp) in three different sowings revealed that the February 21 sowing recorded higher grain yield than the June 21 and September 21 sowings. The yield was more influenced by number of pods per plant rather than the 1000 seed weight and number of seeds per pod. Air temperature at 33°C was found to be an inhibitor for pod setting. A clear cut difference in HI could be noticed between long and short duration cultivars. September 21 sown long duration crop recorded higher HI than the June and February sown crops. Short duration cultivars recorded higher HI in June sown crop than the other two. This study also suggests to increase the plant density in September sowings so as to get normal yield.

A major problem towards increase in productivity in pigeonpea is the reaction of this crop to the varying agro-climatic situations because of its quantitatively short day plant (Wallis, et al., 1980). The information on the effect of weather parameter on yield components in pigeonpea is meagre. So, the present study was aimed at to find out the influence of date of sowing in the yield and yield components in pigeonpea.

MATERIALS AND METHODS

The experiment was laid out under field conditions in clay loamy soil during 1985. Six pigeonpea cultivars comprised of three long duration (CORG 11, PLS 361/1 and SA 1) and three short duration (Co 5, CORG 5 and UPAS 120) were employed. The plots were replicated thrice in a randomised block. Plants were spaced at 45 x 30 cm. Sowings were taken up in three different sowings

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dates viz., February 21, June 2 and September, 21. The same field was used for growing pigeonpea in all the three sowing dates. Uniform irrigation, plant protection and cultural operations were followed in all the three sowings. The seeds were given **Rhizobium** treatments. All the plots were received N:P:K as 20:40:0 as urea, superphosphate and muriate of potash at the time of sowing. At the time of harvest, five plants from each replication were selected for yield and yield components measurements. The pod setting (percentage) was worked out as per the method suggested by Sheldrake and Narayanan (1977).

$$\text{Pot set (\%)} = \frac{\text{Number of pods per plant}}{\text{Number of scar per plant} + \text{Number of pods per plant}} \times 100$$

The meteorlogical observations like temperature, relative humidity and evaporation were accumulated for the cropping period for each cultivar and the mean data presented (Table 1).

RESULTS AND DISCUSSION

Date on yield and yield components presented in Table 2. Grain yield per plant decreased progressively from 21.2.84 to 21.9.84 sowings In all these, the long duration cultivar performed better than the short duration cultivars. The decreased grain yield in September sowings may be attributed to lesser cropping period (Table 1) and lower maximum, minimum temperatures coupled with high Relative Humidity and lower evaporation in September sowings that the June and February sowings. This was in agreement with the findings of Roysharma et al., (1980) who reported that the pigeonpea grown in the cool post-rainy season matured earlier and its growth and yield were much lesser than the kharif. 1000 seed weight was also significantly altered by sowing dates. September sowing recorded lower weight than the other sowings. The number of seeds per pod also followed the same trend.

As in the case of grain yield, the number of pods per plant also decreased progressively from February to September sowings. So it was evident that number of pods per plant is the most important variable determining yield in pigeonpea (Rao and Willey, 1980). A progressive increase in pod setting was noticed from February to September sowing. The low pod setting in February sowing may be ascribed to the high temperature prevailed during the cropping season. With regard to HI, the short duration cultivars always exceeded the long duration cultivars. Peculiarly, the HI in long duration cultivars increased progressively from February to September sowings. Contrastingly, the short duration cultivars recorded the highest HI in June sowing followed by February and September sowings. As it is a quantitatively short day plant, the response to decreasing day length and cool temperature was more in long duration cultivars than the short duration cultivars. The lesser cropping period (Table 1) in September sowing for long

TABLE 1 : Mean meteorological observations during the cropping period.

Date of sowing	Cultivars	Temperature (°C)		Relative humidity		Evaporation (mm)	Cropping period (days)
		Maximum	Minimum	Maximum	Minimum		
	CO 5	33.26	22.06	84.17	43.57	5.40	123
	CORG 5	33.01	22.14	83.25	44.28	5.53	134
	UPAS 120	33.36	22.00	83.83	43.33	5.39	120
21.2.84	CORG 11	33.37	22.09	82.70	46.64	5.93	210
	PLS 361/1	32.36	22.00	82.62	46.85	5.80	218
	SA 1	32.29	22.01	82.91	47.45	5.69	224
	CO 5	30.84	22.01	81.92	53.44	5.80	117
	CORG 5	30.81	21.79	81.94	52.81	5.86	121
	UPAS 120	30.96	22.13	81.73	53.61	5.87	109
21.6.84	CORG 11	30.34	20.78	83.34	52.79	5.61	179
	PLS 361-1	30.27	20.68	84.40	52.48	5.00	182
	SA 1	30.23	20.54	84.56	52.30	4.98	186
	CO 5	29.34	19.50	89.27	53.45	3.33	112
	CORG 5	29.29	19.46	89.35	53.14	3.37	118
	UPAS 120	29.47	19.37	89.17	52.22	3.49	103
21.9.84	CORG 11	29.61	19.12	88.86	50.52	3.62	147
	PLS 361/1	29.73	19.22	88.39	49.97	3.69	154
	SA 1	29.84	19.16	90.75	49.24	3.76	159

TABLE 2 : Effects of time of sowing on yield and yield components in pigeonpea.

Treatment	Cultivars	Grain yield (g/plants)	1000-seed weight (g)	No. of seed per pod	No. of pod per plant	Pod set (%)	HI
	CO 5	41.20	78.28	2.69	220.2	12.21	31.0
	CORG 5	47.90	76.95	2.71	241.2	11.85	31.9
	UPAS 120	33.58	54.25	2.31	170.8	12.00	37.8
21.2.84	CORG 11	160.60	73.34	2.81	962.2	10.81	6.68
	PLS 361/1	178.75	80.33	3.00	944.2	12.61	7.00
	SA 1	186.68	81.48	3.12	1045.6	11.59	7.14
	CO 5	28.90	72.20	3.10	187.2	16.00	39.0
	CORG 5	30.60	81.60	2.93	195.6	15.60	35.0
	UPAS 120	24.80	60.60	3.16	116.7	14.50	43.0
21.6.84	CORG 11	49.60	83.20	3.23	409.2	13.10	18.0
	PLS 361/1	50.40	86.30	3.56	412.8	12.30	15.0
	SA 1	59.10	82.40	3.40	487.4	13.60	17.0
	CO 5	13.40	74.60	2.86	128.8	18.00	28.50
	CORG 5	16.74	77.20	2.91	142.5	16.10	32.90
	UPAS 120	10.07	56.40	3.00	95.0	16.60	27.80
21.9.84	CORG 11	35.87	80.20	2.90	266.4	15.30	25.10
	PLS 361/1	25.67	81.30	2.85	195.4	17.30	22.10
	SA 1	37.16	79.80	3.16	279.0	16.60	22.20
	CD	4.97	4.58	1.30	81.9	2.79	6.08

duration cultivars was mainly stemmed from reduced vegetative phase (Anon., 1978) and resulted in less dry matter production. Probably, this could the reason for high HI in September sowings. The HI of rabi pigeonpea was higher (35%) than the Kharif (28%) season has also been reported by earlier workers (Sheldrake and Narayanan, 1977).

From this study, it was evident that both the short and long duration cultivars sown in February recorded higher grain yield than the June and September sowings. This was mainly influenced by the number of pods per plant rather than 1000 seed weight and number of seeds per pod. High temperature (33°C) may be an inhibitor for pod setting. The long duration cultivars responded in the September sowings than the short duration cultivars. Earlier cropping perid coupled with high HI was clearly established in September sowings. This study also suggest that to increase the yield in long duration cultivars in late.

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