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SEEDLING HANDEDNESS IN CAJANUS CAJAN (L.) MILL SP IN RELATION TO SEED POSITION

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THIS note describes the results of the possible effect of the position of seed in the pod on seedling handedness in *Cajanus cajan* (L.) Mill sp., whose seedling handedness was first described by Rao and Bahadur¹. Recently, Bahadur *et al*² studied the various aspects of seedling handedness in relation to yield.

Twenty five healthy pods selected at random representing 5 cultivars of *C. cajan* obtained through the courtesy of ICRISAT were used without considering the seedling handedness of the parent. The seeds from each pod were numbered starting from the fruit stalk. They were sown in small plots (2×2 m) and suitably numbered for the pod and the seed within it. Handedness of the seedling was scored when the seedlings emerged following the technique used earlier¹, and the data analysed and interpreted.

Table 1 summarizes data on seedling handedness in relation to seed position in 25 pods of 5 varieties of *C. cajan*. A perusal of the data shows that the seed in the first position of all the cultivars but one, produced excess of left-handed seedlings and the same trend is shown even by the seed at the second position. It is only at the third position that the seed showed a uniform excess of right-handed seedlings. In the fourth position, however, the seed arrangement with regard to seedling handedness appears to be haphazard and bizarre with excess of left-handed seedlings in some pods and right-handed seedlings in other irrespective of the cultivars studied.

A perusal of the compounded data given in table 2 shows that in almost all the varieties, the position of the first and second seed in the pod gave high percentage of left-handed seedlings, although on the total, the first seed showed a slight excess of left-handers. The position of the third seed uniformly showed an excess of right-handed seedlings not only within the 5 cvs examined but even on the total. As pointed out earlier, the seed at the fourth position showed a tendency to wobble, and the excess of left-handed is seen in some cvs and RH in others, but on the whole an excess of right-handed seedlings was observed. A study of the combined data strangely showed equality of left and right-handed seedlings. Thus seedling isomerism is correlated with mathematical isomerism and it is because of this rule that the seedling character perhaps cannot be fixed³.

What controls the seed position that which in turn controls seedling handedness is a mystery, but the reasons appear to be morphogenetical and are laid down at the time of ovule initiation. Whether this has anything to do with enantiomer selectivity of certain metabolites during ovule morphogenesis is a matter of conjecture but such a possibility is not ruled out.

More experiments in this direction are needed to establish the genetic purity of seedling handedness, since earlier attempts despite repeated selection of the desired seedling type have failed⁴.

It may be of interest to point out that left and right ovule position in flowers of *Medicago sativa* influences the seed set and out-crossing rates. Whether the same holds true of *Cajanus* is presently not known⁵.

18 January 1983

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TABLE 1
Seedling handedness in relation to seed position in pods of *C. cajan* cvs.

Pod number	Hy-2 seed position				7406 seed position				7131 seed position				6915 seed position				7220 seed position			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	L	—	R	L	R	L	R	—	R	L	R	L	L	R	R	L	L	L	R	—
2	L	R	R	L	R	R	L	—	R	L	R	—	R	—	—	R	L	L	R	R
3	L	L	R	L	R	L	R	—	L	R	R	—	L	L	R	L	—	—	L	R
4	L	R	R	L	L	R	R	R	L	L	R	—	L	L	R	R	R	L	R	—
5	L	L	L	R	R	L	L	L	—	L	L	R	R	L	L	R	L	R	L	R
6	L	L	L	L	L	R	R	L	—	—	R	—	—	L	R	—	L	R	L	R
7	L	R	L	—	L	R	R	L	R	R	L	L	R	R	L	R	L	L	R	R
8	—	—	R	—	L	L	L	R	L	L	L	R	L	—	R	L	R	L	L	R
9	R	—	—	—	L	L	L	R	L	R	R	L	—	L	R	L	L	R	L	R
10	R	—	R	—	L	L	L	L	L	R	L	R	L	R	L	R	R	R	R	—
11	L	L	R	—	—	—	R	—	R	R	R	L	R	L	R	R	L	L	R	L
12	L	L	R	—	—	—	R	—	L	L	R	L	L	L	R	L	—	—	R	L
13	R	R	L	R	R	—	R	—	L	L	—	R	L	R	R	R	L	—	R	—
14	L	R	R	—	L	—	—	—	—	—	L	R	R	L	R	L	L	R	—	L
15	L	L	R	L	—	L	R	—	—	—	—	R	R	L	R	R	R	L	L	R
16	R	L	R	L	—	R	L	—	L	L	R	R	L	L	L	R	L	—	—	R
17	L	R	R	R	—	R	—	R	R	L	R	L	R	L	L	R	R	—	R	—
18	L	R	R	R	L	L	R	L	L	L	L	R	—	—	R	—	R	L	R	—
19	—	—	—	L	L	—	R	L	R	L	R	L	—	R	—	—	R	R	L	L
20	—	—	—	L	L	—	—	R	R	R	L	L	—	—	R	—	—	—	R	—
21	R	L	—	—	L	L	R	L	R	R	—	—	R	L	R	L	R	L	R	—
22	—	—	R	L	L	R	R	L	L	R	—	L	L	L	L	R	L	R	—	—
23	R	R	L	R	L	—	R	—	L	—	—	R	R	L	R	L	L	—	R	—
24	L	L	R	—	L	—	—	—	R	—	R	L	—	—	—	L	—	L	L	R
25	—	—	R	—	—	R	—	—	L	L	R	L	—	L	R	L	L	—	R	—

Key: L=Left R=Right (—)=Seed failed to germinate.

TABLE 2
Compounded data on seedling handedness in relation to the position of seed in pods of *C. cajan* (Percentage values).

Cultivars	Position of							
	First seed		Second seed		Third seed		Fourth seed	
	LH	RH	LH	RH	LH	RH	LH	RH
Hy2	70	30	53	47	24	76	64	36
7406	74	26	53	47	24	76	38	62
7131	56	44	60	40	35	65	55	45
6915	60	50	75	25	41	59	48	52
7220	62	38	59	41	43	57	29	71