

STUDIES ON THE PHYSIOLOGICAL POTENTIAL OF SEEDS OBTAINED FROM VARIOUS PICKINGS IN VARALAKSHMI COTTON HYBRID (*G. hirsutum*)

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Seed obtained from the five pickings was separately graded into bolder, smaller and unsorted groups and evaluated for the quality characters. It was observed that number of nodes per plant, sympodiol number and their length, leaf area, boll number and yield potential were influenced by seeds of earlier pickings with bolder type. Similar trend was exhibited in respect of harvest index. Within the picking the bolder seed performed better than the rest of the seed sizes. The ginning per cent was not influenced by seed sizes obtained from various pickings. The necessity of sorting and selection of seeds particularly from earlier pickings for obtaining higher yield in *Varalaxmi* cotton hybrid is emphasised.

Seed size is one of the most important factors effecting the performance and productivity of any crop and cotton crop in particular. The advantages of sowing bolder seeds were reported by Innes (1970) in cotton. There was no significant difference due to seed size on the number of fruiting branches (Yasin Alikhan, 1981) but the seed size was found to influence the number of bolls per plant significantly in five varieties of cotton. The leaf area of plant from larger seed was significantly greater than those from smaller seed (Gelmond, 1972). The superiority of seeds collected from early picking on leaf number is quite evident from the findings of Godnovar (1982) who reported that the plants obtained from early picked seeds from which crop produced had more number of leaves than the plants obtained from later picked seeds. Yasin Alikhan (1981) also reported that bolder seed had no influence on quality attributes of kapas in cotton.

A lot of variation in cotton seed was expected since seed is obtained right from first picking to fifth picking. It is also of general experience that first few pickings give bolder seed and the later picking yields smaller, illfilled and immature ones. Thus the seed bulked right from the first picking through last picking contain an array of seed sizes and possibly this may be the reason for extremely low germination per cent (60%) recorded in this crop under field conditions. It is against this background, an attempt was made to study the influence of seed size and seed from various pickings on physiological performance of *Varalaxmi* Cotton.

MATERIALS AND METHODS

The seed material in five pickings was obtained from kapas gathered in the seed production plots of *Varalaxmi* i.e. *Laxmi* emasculated and pollinated by SB 289E. The time lag between any two consecutive pickings was 25 days. The

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seeds from each picking were again graded into three sizes with the help of dial gauge mater, the physical properties i.e. (seed size (cm) and seed index (g) of each of these grades are presented in Table 1. The experiment was laid out in a split plot design with three replications, keeping five pickings as the main plots and three seed groups as the sub-plots. The plot size was 29.7 square meters and spacing adopted was 100 × 60 cm. The various package of practices recommended for the crop were attended throughout the crop growth. The following observations were recorded: number of sympodial branches, on main stem and their length, number of nodes on main stem, leaf area, number of bolls per plant, 100 seed weight and kapas yield (q/ha). The harvest index was worked out from the dry weight of the stalks and plot yield. The ginning percentage was calculated from the weight of the lint as a percentage of the weight of seed Cotton.

RESULTS AND DISCUSSION

The data on seed size and seed index derived from mother plant clearly exhibited superiority of bolder seed over unsorted and smaller seeds and that of earlier pickings when compared to later pickings. Earlier pickings produced larger seeds and in particular the seeds from second pickings produced more seed weight (Table 1). This may be attributed to the position of the flower on the plant and the photosynthetic supply due to less competition because of the production of lesser number of bolls on the plant during early reproductive phase. Similar observations were made by Solovev (1962) in cotton.

Sympodial branches, being fruiting branches might have contributed directly to the yielding ability. The seed from early pickings particularly that of second picking produced more number of sympodial length, thus enhancing more number of potential points for bearing fruiting than latter pickings (Table 2). Similarly seed size also had positive effect on these two parameters. The plants from the seed of earlier pickings and bolder seed maintained its superiority in producing more number of nodes on main stem, leaf area per plant and number of bolls. Such increase in number of bolls per plant with bolder seed was reported by Yasin Alikhan (1981). The leaf area per plant was more with the plants from earlier pickings and bolder seed which might be responsible for the copious supply of photosynthates for production, retention and development of bolls. Gelmond (1972) observed more leaf area on the plants raised from bolder seed.

Plant from earlier pickings (particularly first and second) recorded significantly higher yields than from the later pickings (Table 3). There was a drastic reduction in yields with seed from third picking onwards and similarly bolder seed always recorded significantly higher yields than the smaller seed at any level of picking. The difference between second picking which recorded maximum yield and fifth picking which recorded lowest yield was as high as 11 q/ha. The difference between second and third picking was as high as 7d/ha and the difference in yield between bolder and smaller seed was 4 q/ha. Innes (1970) also obtained similar results in cotton. Bolder seed realised from earlier

Table 1. Physical properties of the cotton seed of the different pickings harvested from mother plant

Grade	Seed size (cm ³) pickings						Seed index (g) pickings					
	P ₁	P ₂	P ₃	P ₄	P ₅	Mean	P ₁	P ₂	P ₃	P ₄	P ₅	Mean
Bold (S ₁)	5.37	5.49	4.62	4.14	3.68	4.66	14.15	14.41	11.06	9.91	8.80	11.6
Small (S ₂)	4.78	4.93	4.01	3.45	2.78	3.99	11.50	12.00	8.91	8.05	6.16	9.32
Unsorted (S ₃)	5.12	5.14	4.23	3.92	3.20	4.32	13.10	13.76	10.13	9.43	7.73	10.83
Mean	5.09	5.18	4.28	3.83	3.22	—	12.91	13.39	10.03	9.13	7.56	—

Table 2. Effect of Seed size obtained from different pickings on physiological parameters and yield components

Parameters	Seed size (S)				Pickings (P)					CD (P = 0.05%)
	Bolder (S ₁)	Smaller (S ₂)	Unsorted (S ₃)	CD (P=0.05%)	P ₁	P ₂	P ₃	P ₄	P ₅	
No. of sympodials per plant	34.42	32.54	33.47	0.19	35.72	40.43	33.10	30.55	27.84	0.45
Total length of sympodial per plant (cm)	1598.10	1335.9	1415.3	16.1	1649.1	1855.9	1400.1	1247.7	1096.2	37.9
No. of nodes per plant on main stem	41.37	38.60	40.20	0.50	41.65	42.52	40.42	38.87	36.95	0.96
Leaf area dm ² / plant	266.11	231.36	253.04	11.12	264.55	287.22	260.18	230.16	208.40	23.96
No. of bolls per plant	96.77	88.28	91.52	2.25	103.84	108.54	90.03	79.73	78.87	6.81
100-seed weight (g)	9.19	7.36	8.21	—	8.47	8.86	8.05	8.45	7.45	—
Harvest index (%)	20.11	18.81	19.23	—	21.55	22.27	18.91	17.80	16.37	—
Ginning percent- age	39.21	38.08	37.40	—	38.37	39.37	38.08	40.02	35.31	—

Table 3 - Kapas yield (p/ha) as influenced by pickings and seed size,

seed size	Pickings					Mean
	P ₁	P ₂	P ₃	P ₄	P ₅	
S ₁	28.25	29.80	22.07	20.56	18.41	23.81
S ₂	24.15	25.03	19.70	18.65	16.28	20.76
S ₃	24.68	26.37	21.58	19.17	16.98	21.75
Mean	25.69	27.06	21.12	19.46	17.22	

C. D (P)	=	0.05%
Pickings (P)	=	0.29
Seed size (S)	=	0.35
P X S	=	0.77
S X P	=	1.73

picking and the vigour of the plant from such bolder seed was expressed by producing more number of sympodials and their length and leaf area. The increased photosynthetic area from the plants of earlier pickings might have contributed for increased boll production and their development.

Similarly seed from earlier pickings and bolder seed at any level of picking had more harvest index and 100-seed weight (Table 2). Pickings and seed size did not markedly affect the ginning percentage.

The number of nodes on the main stem, number of sympodials and their length, leaf area, number of bolls, harvest index were more with seeds from earlier pickings and bolder seed. It can be concluded from the findings that the sorting and selection of seed from first

two pickings and rejection of seed from fourth picking onwards will be of great advantage for realising higher yields in *Varalaxmi* hybrid cotton.

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