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INFLUENCE OF SEED SIZE ON POD AND HAULM PRODUCTION AND YIELD IN GROUNDNUT (*Arachis Hypogae* L.) CV. POL. 1 AND TMV. 2.

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A study was carried out to understand the extent of influence of seed size on pod and haulm production and also yield in groundnut, with two promising cultivars, POL 1 and TMV 2. The study revealed that the number of mature and well-dried pods per plant was highly significant and showed positive reltaionship with seed size. No precise relationship was discernible between seed size and number of immature-pods per plant although there was a consistant increase in the weight of immatures as the seed size increased in both the varieties The yield of dry haulm showed significant increase with increase in seed size in both the varieties. The plot yield differences of mature dry pods obtained from crops grown from different seed sizes did assume significance, despite the high numerical increase in yield with the increase in seed size in both the varieties. On an average by using the largest seed, increased yield of mature and dry pods to the extent of 13.4 and 6.5 per cent could be obtained in POL 1 and TMV 2 respectively.

Several researchers have studied the influence of seed size on crop growth and yield in different crops. Alaxander (1957) working with peanut Var. Virginia Bunch 46-2 found the increase in seed size to augment the yield. Singh (1970) found a positive correlation between seed size and pod yield in peanut Dharmalingam and Ramakrishnan (1981) found a position correlation On the Bruce Hunter and Kannenberg (1972) in contrary Corn and Hartwig and Endwards (1970) in soybean reported that the seed size had no effect on final yield level inlegumes.

The present study was undertaken with two popular varieties of groundnut, POL 1 and TMV 2 to determine the extent of influence of seed size on pod and halum production and yield.

MATERIALS AND METHODS

Groundnut seeds of POL 1 and TMV 2 varieties were obtained from Agricultural Research station, Tindivanam and multiplied under irrigated condition in Coimbatore, adopting the recommended package of practices for each variety with a view to eliminate the variability due to locality if any. The kernals were separated and size - graded using metal sieves possessing 21/64", 20/64", 18/64" and 16/64" diameter round perforation, respectively. A field trial was laid out in a randomised block design with three replications. The variants in each variety were the four size grades with an ungraded cleaned bulk seed. The crop was raised by adopting all the recommended package of practices for irrigated crop. On the 20th day of sowing five plants were selected at random from the middle ten rows of

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each plot and labelled for recording the observation on each plot.

The crop was harvested on 107th day and the marked five plants were taken for recording mature and immature pods. The total number of mature pods were counted plantwise and recorded. They were dried for 48 hr in a hot air oven maintained at 85°C and the dry weight of pods recorded plantwise after cooling them in a desicator. From these values, the mean number and dry weight of immature pods were calculated treatmentwise. The mean number and weight of immature pods were also calculated treatmentwise as was done in the case of mature pods.

For determining the influence of seed size on the ultimate yield of the commercial produce, only mature and uniformly well dried pods obtained from plants harvested from the ten experimental rows, barring the border plants, were weighed and recorded treatmentwise. The area occupied by these experimental plant was 8.44m² per plot and the hectare yield was calculated only from the respective plot-yield values.

The haulm of the plant was obtained by substracting the weight of mature and immature pods from the total dry matter production. From the haulm yield of these five plants, the haulm yield per hectare was calculated on field stand basis.

RESULTS AND DISCUSSION

Observations made on the total number and weight per plant are furnished in Table 1. Singh *et al* (1972) observed that the plant from the largest seed produced the highest number of pods per plant which was, however, not reflected in the final seed yield in soybean. Identical results were obtained in the present study with the two groundnut varieties. The plants from 21/64" and 20/64" retained seeds recorded 32.94 and 56.4 per cent more number of mature pods over those from 16/64" retained in POL.1 while in TMV 2 the corresponding increase for the respective sizes were 32.07 and 29.30 per cent. The reason for this large difference in the number of pods is obviously due to the relatively more number of flowers and pegs produced by the plants from large seeds. The high per plant mature pod yield by weight obtained in plants from larger seeds of both the varieties was mainly due to the numerical increase in the pods, which, however, had not attained the leval of significance. The extent of variability in the number and yield of pods per plant noticed between the plants from the largest and smallest seed classes was very wide only in TMV. 2 due to lack of uniformity in yield expression among plants from the smallest seed. The difference in the number of immature pods produced between the plants from different seed sizes was inconsistant. But the dry weight of immature pods per plant, however, showed a linear relationship with seed size probably due to the relatively large size of immatures produced by those from larger grades.

The haulm production per plant was positively correlated with seed size which paralleled the findings of Austenson and Walton (1970) in wheat. The reasons of increased growth, plant height and total dry matter production

Table 1. Effect of seed size on pod and haulm production in POL 1 and TMV 2 groundnut (Mean values)

Seed sizes	Mature pods/plant		Percentage on S_4		Immature pods/plant		Haulm weight/plant (g)	Percentage on S_4	C.V. % of mature pods	
	Number	Weight (g)	Number	Weight (g)	Number	Weight (g)			For number	For weight
POL 1										
21/64"(S_1)	11.3	9.53	132.94	133.09	2 77	0.66	8.65	127.02	10.04	13.31
20/64"(S_2)	13.3	10.12	156.47	141.34	3.23	0.68	8.99	132.02	8.39	9.60
18/64 "(S_3)	9.9	7.55	116.47	105.44	3.03	0.49	6.28	92.22	6.70	7.23
16/64"(S_4)	8.5	7.16	100.00	100.00	2.53	0.48	6.81	100.00	10 39	15.98
Udgraded(Ug)	8.1	6.66	95.29	93.01	3.10	0.55	5.92	89.93	11.64	13.34
TMV 2										
21/64"(S_1)	14.0	10.13	132.07	138.59	3.20	0.64	9.52	132.41	5.52	5.30
20/64"(S_2)	13.6	9.29	128.30	151.26	3 30	0.44	8.27	117.64	6.75	9.60
18/64"(S_3)	10.6	7 63	100 00	104.38	2.73	0 54	6.41	87.34	7.72	10.90
16/64"(S_4)	10 6	7.31	100.00	100.00	3.80	0.40	7.03	100.00	12.90	13.76
Ungraded(Ug)	9.9	8.70	93.4	119.02	2.87	0.63	8.12	115.50	7.28	11.18
CD (P=0.05)										
Variety(v) =	N.S.	N S.	—	—	N.S.	N S.	N S.			
Size(S) =	5.68	N S.	—	—	N.S.	N.S.	3.73			
VXS =	N S.	N S.	—	—	N.S.	N.S.	N.S.			

Table 2. Effect of seed size on yield of pods and haulm in POL 1 and TMV 2 groundnut (mean values)

I) Actual mean yield of mature pods/plot of 8.44 m^2

II) Calculated hectare yield of mature pods and haulms (on filed stand basis - statistically not analysed)

Seed sizes	I		II		
	Mature pod Dry weight in kg	Percentage on 16/64"	Mature pods dry weight in kg	Haulm	
				Dry wt. in kg	Percentage on16/64"
POL 1					
21/64"	1.788	113 88	2118	2286	126.60
20/64"	1.673	106.08	1982	2248	124.40
18/64"	1.653	104.82	1959	1733	95.90
16/64"	1.577	100.00	1869	1807	100.00
ungraded	1.570	99.55	1860	1501	83.06
TMV 2					
21/64"	1.583	106.53	1876	2470	143.27
20/64"	1.552	104.44	1839	2127	123.38
18/64"	1.563	105.19	1852	1564	90.72
16/64"	1.486	100.00	1761	1724	100.10
Ungraded	1.414	95.16	1675	1819	105.51

CD (P= 0 05)	*Matured pod yield/plot*
Variety (V) =	9.02
Size (S) =	N.S.
V X S =	N.S.

are of relevance in accounting for the positive association of this attribute with seed size. The hectare yield of haulm from the plants grown from largest seed calculated on actual field stand basis showed 26.6 per cent more over those from 16/64" retained seeds in POL 1 while the corresponding increased percentage was 43 27 in TMV.2.

The plot yield differences of mature dry pods obtained from crops grown from different seed sizes did not assume significance, despite the high numerical increase in yield with the increase in seed size in both the varieties. This yield increase was only due to larger number of pods produced by the plants from larger seeds, as discussed elsewhere. The plots sown with largest seed of POL 1 yielded 13.89 and 13.38 per cent more yield over those sown with ungraded and 16/64" retained seeds, respectively, while the corresponding increase were 11.95 and 6.53 per cent over the respective classes of seeds in TMV 2.

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