

EFFECT OF SHADE OF *ACACIA ARABICA* (KIKAR/BABUL) AND *DALBERGIA, SISSOO* (SHISHAM) ON THE YIELD OF WHEAT

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**Summary.** In a study conducted to find out the extent of the effect of tree shade on the yield of wheat, it has been indicated that trees do have deleterious effect on the crop yields, the maximum loss being within 2-meter radius of the tree and also the yield is poorer from the portions of the crop falling on the northern side of the tree

*Objective:* To find out how far the shade of individual trees growing in the agricultural fields affected the yield of crops.

**Material and Method.** Five trees of *Acacia arabica* (Babul/Kikar) and five of *Dalbergia sissoo* (Shisham) were selected in two different localities in the country viz Chichawatni (30.5 N.Lat) and Changa Manga (31.0 N.Lat.). As far as possible trees of uniform height, diameter and crown spread were selected as under:

Name of the species	Av ht (m)	Av dia (cm)	Av crown spread (m)
<i>Acacia arabica</i>	15.3	53.3	13.2
<i>Dalbergia sissoo</i>	16.2	55.2	13.3

Taking each tree as a replication and its trunk as centre, circles of a radius of 2, 4, 6 and 9 metre were drawn in the wheat field (variety chenab 70). Samples were taken with a 0.1 m square frame at 8 fixed spots conforming to directions, E, W, N, S, NE, NW, SE and SW. Apart from recording the observations such as length of the wheat stalk and length of the ear, following data directly connected with the yield were collected:

- Number of ears per sample
- Number of grains per ear
- Total weight of all the grains per sample

Data in summary form are given in appendices 1 and 2.

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**Result and discussion.** *ACACIA ARABICA*. Total and mean weight of samples according to distance and direction are given in tables 1 and 2 below:

TABLE 1

*Weight of samples according to distance (gms)*

Distance (d)				
Replication	2m	4m	6m	9m
I	63.5	70.0	80.5	103.5
II	64.5	74.0	83.5	103.0
III	63.0	79.5	82.0	93.5
IV	67.5	79.5	83.5	95.0
V	73.0	83.5	88.0	96.5
Total	331.5	386.5	417.5	491.5
Mean	8.29	9.66	10.44	12.29

**Effect of distance.** As the distance of crop increases from the trees, so does the yield, Control (9m) has given the highest yield followed by samples taken at 6m and 4m which form one group. The lowest yield has been obtained from the nearest distance (2m) and it is significant at 1% level.

TABLE 2

*Weight of samples according to direction (gms)*

Direction (d)								
Replication	E	S	N	W	NE	NW	SE	SW
I	40.0	40.0	36.0	41.0	37.0	38.0	44.0	41.5
II	40.0	40.0	36.5	44.0	37.5	39.0	43.5	44.5
III	40.5	41.0	37.5	41.0	35.0	35.5	42.5	45.0
IV	39.0	40.5	39.0	43.5	38.0	39.0	46.0	40.5
V	42.5	44.0	39.5	45.0	40.0	37.0	46.5	46.5
Total:	202.0	205.5	188.5	214.5	187.5	188.5	222.5	218.0
Mean	10.10	10.27	9.42	10.72	9.37	9.42	11.12	10.90

**Effect of direction.** The following groups exhibit highly significant (1%) level differences for the yield:

NE, N, NW

E, S

W, SW, SE

Plots due SE, SW and W of the trees have given the maximum yield followed by E and S; and last NE, N, NW. This shows that the portions of crop getting more sun during the day have yielded more grain.

*DALBERGIA SISSOO*. Total and mean weight of samples according to distance and direction are given in tables 3 and 4 below:

TABLE 3  
Weight of samples according to distance (gms)

Distance (D)	2m	4m	6m	9m
Replication				
I	93.0	97.5	127.0	140.0
II	93.0	100.0	130.5	143.0
III	96.0	102.5	137.5	145.0
IV	96.5	112.0	134.5	145.5
V	96.0	99.5	131.5	145.5
Total	474.5	511.5	661.0	719.0
Mean	11.86	12.79	16.52	17.97

**Effect of distance.** The yield follows the same pattern as that of *Acacia arabica*; it is progressively higher with the increase in distance from the tree. Again control (9m), has given the highest yield (0.1 level) followed by 6, 4 and 2 m samples respectively.

TABLE 4  
Weight of samples according to direction (gms)

Direction (d)	E	W	N	S	NE	NW	SE	SW
Replication								
I	60.0	60.0	51.0	62.0	54.5	50.0	61.0	59.0
II	58.5	59.0	52.5	64.0	53.0	51.5	64.0	64.0
III	60.0	61.0	54.5	67.0	56.5	55.5	64.0	62.5
IV	64.0	65.0	55.5	62.5	55.5	57.5	64.0	64.5
V	61.5	59.0	54.5	64.0	56.5	53.0	63.0	61.0
Total	304.0	304.0	268.0	319.5	276.0	267.5	316.0	311.0
Mean	15.20	15.20	13.40	15.97	13.80	13.37	15.80	15.55

**Effect of direction.** Samples taken from S, SE, and SW direction have given the highest yield followed by W and E which form the intermediate group. NE, N and NW have given the minimum yield (0.1 level). The last group indications are also in conformity with *A. arabica*.

**Conclusion.** The study indicates that both distance from the tree and direction of the tree shade have a highly significant effect on the yield of *Chenab 70* for *D. sissoo* as well as *A. arabica*. The yield was lowest at a distance of 2 metres from the centre of the tree and when the plots were due N, NE and NW of the trees. In the latter case the grains were found shrivelled and not ripe fully.

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