

EFFECT OF FOREST TREES ON THE YIELD OF AGRICULTURAL CROPS

by

G.M. Khattak and M.I. Sheikh

To study the effect of forest trees on the yield of agricultural crops grown with them, *Dalbergia sissoo* (shisham) *Euc. citriodora*, *Populus deltoides* 63/51 and *Salmalia malabarica* (semal) were planted in the Pakistan Forest Institute in January-February 1978 in RCB design with four replications. The size of plot was 444 m² and trees were planted at 4.3 x 4.3 m spacing with entire plants of poplar and Eucalyptus and root-shoot cuttings of shisham and semal

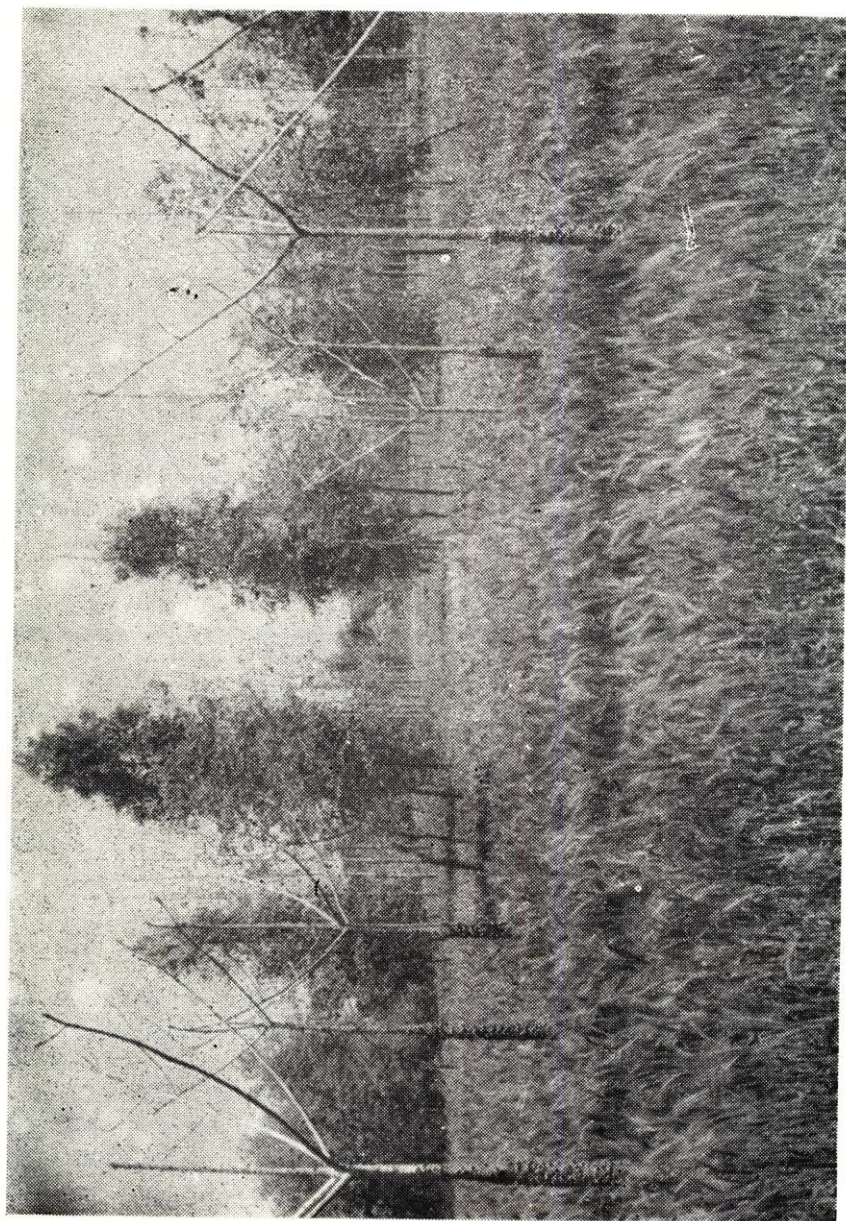
On 22-10-1979 the area was irrigated to prepare it for wheat sowing. On 5-11-1979 Pavan variety of wheat was sown in drills 45 cm apart between the lines of trees. The drill next to the line of trees was 80 cm away from it. Seed rate was 135 kg/ha. Urea was applied on 4-12-1979 at the rate of 230 kg/ha. Two irrigations of 10 cm depth each were given to the crop on 4-12-1979 and 14-4-1980. From sowing to harvesting on 2-5-1980, 240 mm rain was received.

Effect of distance from tree on yield of wheat. At harvest the size range of the trees was as follows:

<i>Species</i>	<i>Height</i> (m)	<i>d b h</i> (cm)
Eucalyptus	3—7	3—7
Poplar	6—10	6—12
Semal	2—3	6—10
Shisham	3—5	4—7

In each plot, four trees were selected at random from the two central rows. If any of the trees selected were either missing or malformed, top broken, diseased, or defective, then its neighbouring tree on the north was chosen to replace it. If even this was not suitable for the reasons stated above, the tree to its south was taken. Taking each tree as the centre, wheat was harvested along one metre length in each of the four rows to the east and four rows to the west of the tree. The first row was 80 cm from the base of the tree, the second 125, the third 170 and the fourth 215. The cut material was dried in the sun for 3 days and grain was extracted from each lot by hand. The average yield, in grams per 1 m line of wheat, is summarised below for each species:

The authors are Director General, and Director, Forestry Research Division respectively at the Pakistan Forest Institute, Peshawar.



Wheat under two year old shisham, semal, poplar and Eucalyptus

Species	Row 1		Row 2		Row 3		Row 4	
	E	W	E	W	E	W	E	W
Eucalyptus	129	160	114	124	128	135	113	131
Poplar	98	76	86	80	109	81	94	82
Semal	119	132	127	124	130	152	110	113
Shisham	170	151	130	145	125	143	137	148

No statistically significant difference was found in the yield of wheat at distances of 80 cm to 215 cm from the base of the trees.

Effect of tree species on yield of wheat. After taking the spot observations as mentioned above, the wheat crop was harvested and threshed plot wise. The data are summarised below:

<i>Yield of grain (kg/ha)</i>				
	Eucalyptus	Semal	Shisham	Poplar
Replication				
1	3,829	3,560	4,399	2,079
2	3,724	3,127	3,656	2,788
3	5,725	2,925	2,873	2,430
4	2,452	4,147	3,027	2,262
Average	3,182	3,440	3,489	2,390
<i>Yield of straw</i>				
1	3,829	4,009	5,828	2,869
2	4,131	3,467	3,416	2,649
3	2,643	2,879	3,086	2,322
4	2,588	4,054	3,256	2,979
Average	3,298	3,602	3,896	2,705

None of the above differences are statistically significant.