COMPARISON OF GROWTH OF FOUR TREE SPECIES GROWN UNDER AGRO–FORESTRY SYSTEMS

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Summary

Rate of growth of four tree species planted in the agricultural fields has been compared. *Populus deltoides* I–63/51 has come out the best after six years for all the three parameters, viz, diameter, height and volume. For quantity of wood available on first thinnings *Populus deltoides* I-63/51 is followed by *Salmalia malabarica, Eucalyptus citriodora* and *Dalbergia sissoo.*

Layout of the study

To find out the comparative rate of growth of *Populus deltoides* I-63/51, *Eucalyptus citriodora, Dalbergia sissoo* and *Salmalia malabarica* in conjunction with agriculture a study was started in Peshawar on 13-2-1978. 120 plants of each species were planted in 16 subplots at a spacing of 4 x 4 m; 24 plants in all. Planting was done in a randomised complete block design, replicated 4 times.

While one year old entire plants of *P. deltoides* I-63/51 and tubed plants of *Eucalyptus citriodora* were planted, root shoot cuttings of *Dalbergia sissoo* and *Salmalia malabarica* were used in the study.

A variety of agricultural crops, one after the other were planted in between the lines. These include *Sesamum indicum* (Til), maize and wheat. Irrigation was given according to the requirements of agricultural crops.

Growth data

Data on height and diameter were recorded on 29-12-1983 and are compared as under:

Table 1.

Comparative growth of 4 different species, age 6 years

Species / Rep. No.	Salmalia malabarica T_1		Dalbergia sissoo T_2		Eucalyptus citriodora T_3		Populus deltoides T_4	
	dbh(cm)	ht(m)	dbh (cm)		ht (m)	dbh (cm) ht (m)	dbh (cm)	ht (m)
I	21.8	10.36	15.8	10.67	14.7	12.50	21.2	16.46
II	18.4	8.23	13.7	9.75	15.5	13.72	21.3	15.54
III	19.7	9.45	13.3	10.97	14.4	1402	21.1	17.67
IV	19.3	8.84	16.4	10.36	13.7	14.33	21.0	16.76
Total	79.2	36.88	59.2	41.75	58.3	54.57	84.6	66.43
Average	19.8	9.22	14.8	10.44	14.6	13.64	21.1	16.61

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The data were analysed statistically. Analysis of variance showed diameter growth to be highly significant. LSD (Least significant difference) showed poplar to be the best. Simal taking intermediate position and *Dalbergia sissoo* and *E. citriodora* forming the last group. In height growth has been taken up by *E. citriodora* and *Salmalia malabarica* and *D. sissoo* are in the last group.

In July, 1984 thinning was done as the tree crop had become congested. In order to provide a release and equal and uniform space to the leftovers, mechanical thinnings leaving almost alternate trees in the rows was carried out. Consideration was, however, given to retaining better formed trees provided the leftover tree was free on all sides.

The felled trees were measured by converting into the volumes upto 5 cm top diameter. Volume obtained according to species and replications is given below :

Table 2

Volume (m^3) available in the first thinning removing about 11 trees out of 24

Species	Salmalia malabarica		Dalbergia sissoo		Eucalyptus citriodora		Populus deltoides	
Rep. No.	m^3/plot	m^3/ha	m^3/plot	m^3/ha	m^3/plot	m^3/ha	m^3/plot	m^3/ha
I	1.650	37.017	1.277	28.648	1.121	25.149	1.639	36.770
II	1.450	32.530	0.603	13.528	1.303	29.232	1.524	34.190
III	1.758	39.440	0.909	20.393	1.212	27.190	2.342	52.510
IV	0.680	15.255	0.912	20.460	0.361	8.098	2.098	47.067
Total	5.538	124.242	3.701	83.029	3.997	89.669	7.603	170.537
Average	1.384	31.060	0.925	20.757	0.999	22.417	1.90	42.634

Conclusion

Following conclusions are drawn from this study.

- Poplar yields much more wood in thinnings. The other three species i.e. *Salmalia malabarica, Eucalyptus citriodora* and *Dalbergia sissoo* yield comparatively less volume.
- Given the same growth conditions and blanket treatment, *P. deltoides* gives the highest yield in six years followed by *S. malabarica, E.citriodora* and *D. sissoo.*
- First thinning becomes necessary after 6 years even if the plants were initially planted at a comparatively wider spacing of 4 x 4 m.