

## ASSESSMENT OF *PAULOWNIA* LEAVES EFFECT AS MANURE ON GRAIN YIELD OF WHEAT CROP

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### Abstract

The study was conducted in 1996, to assess the effect of *Paulownia* leaves as manure on the yield of wheat crop. Experiment was laid out in randomized complete block design (RCB) replicated four times (8 pots/treatment). The variables to be tested were three doses of well rotted leaf mould manure of *Paulownia* spp. (Control no manure and treatments 75, 150 and 225 gm/treatment) applied to soil in earthen pots (380 cm<sup>2</sup>) supplemented with 10 gm Urea fertilizer/pot as basal dose in all treatments and control. Results indicated that seed germination was insignificantly affected and better plant growth and height was observed in all treatments. The grain yield was higher and significant in doses of manure than control. It is concluded that *Paulownia* leaves manure shows positive effect on wheat and improves the grain yield of the crop. On account of this, *Paulownia* spp. are ideal for agro-forestry in Pakistan.

### Introduction

With the research and extension efforts of Pakistan Forest Institute, Peshawar, exotic fast growing tree species like Poplars and Eucalyptus have been introduced in Pakistan for the production of timber and fuelwood. Nearly a decade before another fast growing tree species (*Paulownia* spp.) from the Peoples Republic of China is under trial for introduction in Pakistan. This tree is suited for agro-forestry because of being deciduous, deep rooted and tall. It is mainly grown as shelter belts and inter-cropping with wheat and maize crops as well as in conjunction with other forest trees in its native country (Anon, 1986). It is a common belief amongst the farmers that tree reduces the yield of agricultural crops and hesitate to grow trees on their farmland while, foresters/researchers argue that trees at maturity not only compensate to the farmer for any suppression in the agriculture crops but also improve the environment and soil

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fertility. Keeping this in view, the present study was initiated to assess the effect of *Paulownia* spp. leaves as manure on the yield of wheat crop.

## Material and Method

Eighteen kg leaves of *Paulownia* spp. growing in the research garden at Pakistan Forest Institute, Peshawar were collected in October, 1996. These were dried and packed in a sack and buried in the soil under moist conditions to hasten decomposition, which took 45-60 days. The experiment was laid out in Randomized Complete Block design replicated four times (8 pots/treatment against control) in earthen pots (380 cm<sup>2</sup>) supplemented with 10 gm of Urea fertilizer/pot as basal dose at wheat sowing time. A total of 128 earthen pots were used, out of which 32 were filled with normal nursery soil while 96 were filled with a mixture of soil and compost leaves at the rate of 75, 150 and 225 gm per pot in each treatment against control. Wheat seeds were sown in earthen pots during last week of November. Initially 7 seeds/pots were sown and later on maintained 5 plants/pot in all the treatment including control. Pots were watered weekly and fortnightly at a rate of one liter/pot till maturity of crop (in case of rainfall no water was given). The experiment was maintained and data on number of tillers /plant recorded in March/April, 97. The wheat crop was harvested at maturity and data were recorded to determine the fresh & dry root & shoots weight/plant (gm), height (cm) and grain yield (gm) of crop. To assess the effect of manure on grain yield of wheat crop, the following parameters were studied as compared to control: T0= control, T1= 75 gm, T2= 150 gm and T3= 225 gm compost of leaf manure, respectively. The wheat grain yield data were analyzed statistically at 5% level of confidence and F value determined (Chaudhary, 1983).

## Result and Discussion

The data on treatment, wheat growth and grain yield are given in table 1 and 2 and ANOVA in table 3.

The data of table 1 indicated that seed germination was 100 percent in all the treatments. Average tillering capacity, fresh & dry root & shoots weight/plant (gm) and height of crop (cm) of T1, T2 and T3 treatments showed their better growth over control except dry shoot weight in T1 and fresh shoot weight is similar to T1 and T2 treatments. Average plant height at mature stage was maximum in T3 (75 cm) followed by T2 (70), T1 (68) and control (65) respectively. However, the differences in the means of tillering capacity, fresh &



dry root & shoots weight/plant (gm) and height of crop (cm) was found statistically in-significant.

Table 1. Comparative performance of different treatments and their effects on wheat crop

Treatment	Germination % age	# of tillers/ plant	Fresh shoots wt/plant(gm)	Fresh roots wt/plant(gm)	Dry shoots wt/plant(gm)	Dry roots wt/plant(gm)	Av.Ht.of Crop(cm)
T0	100	1.20	30	10	12	4	65
T1	100	1.22	32	12	12	6	68
T2	100	1.23	32	13	13	5	70
T3	100	1.25	36	15	15	7	75
Average	100	1.25	32.5	12.5	13	5.5	69.5

### Grain yield

As shown in table-2, the grain yield was higher in all the treatments as compared to control. It was maximum in T3 (42 gm) and minimum in T1 (38.75 gm). These result conform to the findings of Sherchan *et al.* (1989) on paddy grain yields. From the grain yield, it was observed that all treatments proved their superiority over control and the increase in grain yield was significant at 5% level. F-values are given in Table 3. It is therefore, evident that T3 (225 gm/pot) is the best dose of manure among treatments.

Table 2. Effect of different treatments on the grain yield of wheat crop

Treatments	Average grain yield (gm)/pot
T0	34.75
T1	38.75
T2	41.50
T3	42.00

Table 3. Analysis of Variance (ANOVA)

Source of variation	df	SS	MS	Calculated F-value	Tabulated F-value
Treatment	3	132.5	44.2	4.09*	3.86
Replication	3	111.5	37.2	3.44 NS	
Error	9	97	10.8	-	
Total	15	341		-	-

\* = significant at 5% level

NS = Non-significant



## Conclusion

Tree is deciduous and leaves after decaying act as manure and improve the growth and yield of rabi crops. Leaves decompose easily and yield of wheat crop shows positive effect on the grain yield of wheat crop. From the perusal of grain yield, it is concluded that *Paulownia* ssp. as fast growing trees are most suitable for planting under agro-forestry system with wheat crops and can give extra income to the cultivators in terms of higher wheat yield and timber and fuelwood production.

## References

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