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## Germination Study on Five Different Varieties of Pecan Nut

Noor Rehman, Ijaz Hussain, Zaib un Nisa\* and Azmat Ali Awan\*

Agricultural Research Institute Tarnab, Peshawar and

\*NWFP, Agricultural University Peshawar, Pakistan

### Abstract

Five different varieties of pecan nut viz. Mohan, Shawnee, Wichita, Burket and Mohawk were sown and data was recorded on growth parameters. Maximum shoot length (45.58 cm), root number (63.3) root length (49 cm) was recorded in Burket variety while minimum shoot length (32.33 cm) root number (42) and root length (24.3 cm) was recorded in Mohan variety. Maximum germination percentage (82%) was shown in Burket followed by Wichita (80%) while minimum seed germination percentage (58) was noted in Mohan variety. Similarly seed of Wichita took longer time (114 days) and seed of Mohan germinated earlier (101 days).

### Introduction

The Pecan (*Carya illinoensis*) belongs to the Juglandaceae family. It is also called "Mississippi Nut" or "*illinoensis* nut" the Pecan first appeared on the North American continent during the Cretaceous period.

Since grafting and budding success in pecan nut is poor. For this purpose different pecan nut seed were tried to study and find percent seed germination of various pecan nut varieties and to select best possible variety which reaches to buddable size in shortest possible time.

Caminada (1980) while working on the germination of pecan nut noted that incubating pecan nut at 30°C resulted in 96 percent germination with in 15 days. Germination at room temperature (20°C) was poor. He further studies the effect of stratification at 4°C for 60 or 90 days. The longer stratification at room temperature resulted in 80 percent germination. 8 different method were used to enhance germination of pecan cultivars, viz, curtis, Van Deman, Pebest and Freture. The nuts were sown in mid February. Germination was highest in all cultivars (82.5 -89.4%) after cold stratification for 45 days. Germination in the control ranged between 58.4 and 60.5 percent.

Hussain *et al.* (1988) stratified pecan nuts Stuart and Mahan for 30 days, 60 days and 90 days and got significantly highest germination in 90 days cold stratification in both cultivars. The germination decreased with decrease in stratification period. The height and girth of the seedlings were highest in 90 days stratification followed by 60 days, 30 days and least in no stratification. Similarly in an other study Wazir and Hinrich (1988) stated that pecan nut germination data indicate that the period of germination of pecan nut increased as the time of stratification increased. During this study they further noted that germination was more rapid in stratified nuts than non-stratified nuts. Nuts stored at room temperature for 22 week develop rancidity. Goff *et al.* (1992) working on germination of pecan nut CV. Elliot soaked pecan nut initially at 20, 30, 40, 50, 60, 70, and 90°C for 4, 8, 16, 32 and 64 hours. The seed were sown in a pine bark media and allowed to germinate under green house condition

(20-36°C). The best result was obtained by soaking the seed at initial temperature of 20°C for 64 hours. All treatment gave germination percentage of less than 55 percent as compared with 90 percent in stratified seed. Present experiment was designed to find out percent seed germination of various pecan nut seed and comparative growth performance of various pecans nuts seedling.

### Materials and Methods

This piece of research work was designed at Agriculture Research Institute Tarnab Horticulture Section, Peshawar in the year 1997. Five different Pecan nuts variety seeds i.e. Mohan, Burket, Mohawk Shawnee and Wichita, were grown in plastic tube (bags) in month of December.

For filling of plastic tubes first media was prepared by mixing soil sand and garden soil in 1:1:1 ratio and then the plastic bag were punched at the bottom with a punching machine in order to allow the drainage of water and improve the aeration then the seed were sown in the plastic tubes and were regularly watered to keep the bag in moist condition.

Data was recorded on day to germination, germination percentage, stem length, and taproot length and number of fibrous roots. The experiment was laid out at Randomized Complete Block design with three replication. In the trial fifty seed per treatment was used and data were recorded on different growth parameters i.e. days to germination, germination percentage, stem length, root length and root number.

### Results and Discussion

From mean value Table 1 for days to germination, it is evident that maximum days (111) to germination was recorded in Wichita seed followed by Shawnee (106) and minimum days to germination was noted in Mohan (101 days) followed by Mohawk (102 days). The maximum day taken by seed of Wichita variety might be due to its comparatively high chilling requirement. Similarly minimum days (101) were taken by Mohan which is comparatively a thin shelled variety due to which it shell decompose quickly resulting in an early germination of Mohan.

Table 1: Mean values for number of days taken to germinate, germination percentage, shoot length, root length and root numbers of different pecan nut varieties

Variety	Days to Germination	Germination percentage	Shoot length (cm)	Root length (cm)	Root No.
Mohawk	102 B	81.6A	32.66	38.33	63.30
Shawnee	106 AB	70AB	32.41	45.66	58.60
Burket	105 AB	82A	45.58	49.00	64.00
Wichita	111 A	80A	32.41	47.66	45.30
Mohan	101 B	58B	32.33	29.33	42.00

LSD values at 5% for number of days, germination %age are 9.378 and 6.207, respectively. While, shoot length, root length and root numbers are not significant at 5% level of significance.

The mean values for percent seed germination indicates that maximum germination percentage (82%) was recorded in Burket varieties followed closely by Mohawk (81.6%). Likewise minimum germination percentage (58.0%) was recorded in Mohan varieties. Since the seed of Burket varieties fill well and is of good quality, therefore it gave maximum germination. Similarly Mohan variety gave minimum percentage (58%) of seed germination because it seeds don't fill well and its kernel is attacked by a fungal disease (Wiggans and Martin, 1961). From review of the table for shoot length, it is clear that maximum shoot length (45.58 cm) have been recorded in Burket variety and minimum shoot length (32.33 cm) was observed in Mohan. Maximum shoot length in Burket variety seedling may be due to more number of roots in this variety, which in turn gave more nourishment to the plant. Likewise smaller shoot length in Mohan variety seedling is due to the shorter and smaller number of root in this variety. From mean value table for root length it is clear that maximum root length (49 cm) was recorded in Burket variety and minimum root length 29.3 cm in Mohan. The maximum root length of

Burket may be due to varietal characteristic, which make vigorous upright growth. Since pecan is a new introduction very little information is available on varietal characteristic.

### References

- Caminada, P., 1980. Germination of the pecan nut Zimbabwe. Rhodesia Agric. J., 76: 237-238.
- Goff, W.D., L.R. Brasher and J.A. McGuire, 1992. Germination of unstratified pecans is affected by exposure to high temperature and by soaking. Sci. Hortic., 50: 159-163.
- Hussain, A., I. Haq and T. Hussain, 1988. Effect of different stratification period on germination and vigour of pecan nut. Sarhad J. Agric., 4: 267-270.
- Wazir, F.K. and H.A. Hinrich, 1988. Effect of 5th treatments on germination of pecan nut cultiv western. Sarhad J. Agric., 4: 47-57.
- Wiggans, S.C. and L.W. Martin, 1961. The effect of gibberellic acid on germination and seedling growth of pecans. Proc. Am. Soc. Hortic. Sci., 77: 295-300.