

Mango Seed Germination in Different Media at Different Depth

JAWAD ALI^{1*} HAJI MUHAMMAD² IBAD ULLAH JAN³ ANWAR RASHID¹
MUHAMMAD ADNAN³ MHUMMAD ALI¹ WAQAS AHMAD¹ ¹ALI REHMAN¹
JUNAID KHAN³

[1] Department of Horticulture, University of Agriculture Peshawar

[2] Department of Agronomy, University of Agriculture Peshawar

[3] Department of Agriculture, University of Swabi, Anbar, Swabi

Abstract

The research study “Mango seed germination in different media at different depth “was conducted in Jabban, Dargai, Malakand agency during 2010. The results indicate that both media and sowing depths had significant effect on various parameters. In case of different media the minimum days to germination 18.56 the maximum shoot length 5.56cm and maximum number of leaves 5.56 were recorded in soil+sand+fym. Similarly in case of different depth, the minimum days to germination 18.83, maximum maximum shoot length 6.5cm and maximum number of leaves 5.5 were recorded at the depth 7.5cm. It is concluded from the study that mango seed sowing is best in soil+sand+fym in all respects e.g. days to germination, shoot length and number leaves as compared to other media(soil, soil+sand, soil+sand+fym+saw dust) and Mango seed sowing is best at the depth 7.5cm in all respects.

Keywords: *Mango*(*Magnifera indica* L) *Sowing Depths, Different Media, Number of leaves, Shoot Length,*

INTRODUCTION

Mango(*Magnifera indica* L) belongs to the family Anacardiaceae. Mango is one of the most important fruits of the tropical and sub tropical belts, such as Australlia, Egypt, Florida, Malaya, Pakistan, Pihilipine and West Indes. Mango has been favorable fruit in the sub continent throughout the recorded histoer. Mango is considered highly esteemed fruit “The “King Of Fruits” in the region due to its delicious taste, exellent flovor, high vitamin contents and as source substantial returns to the growers.

Based on production, this fruit is rankred second in position citrus in Pakistan and 3rd in the wold production (FAO production year book 1988. Mango is grown on the area of 67,800 hector with local production of 6,82,600 tons in Pakistan for the year 1988.Mangos are mostly grown in the provinces of Sindh and Punjab. In KPK 1400 tons of fruit is obtained from an area of 100 hectares in DI khan.(FAO production year book 1988).

Punjab province occupies maximum area of 44.7 thousand hectare under mango cultivation as compared with 33.8 thousand hectares of sindh (FAO production year book 1988). But due to favorable conditions, fruit matures early in sindh and its supply catches the Punjab markets in early stages and fetches a high price. Beside this also suppresses the prices of local early maturing varieties in Punjab due to satiate conditions in the market.

This leads to high profits for sindh grower even having less area under mango cultivation which ultimately causes great loses to Punjab growers. The reason being that the produce of sindh province will exhaust and the Punjab growers will get their share in profits by supplying these varieties to the local markets or back to sindh for export.

Mango fruit is well reputed for its high dietic with delicious taste and aroma. Being a highly perishable commodity it is very difficult tohandle the crop after harvest.

According to the estimates more than 10 percent of the fruit is wasted due to disease infection, short storege life chilling injury in cold storege and other climetic abnormalities mango worth one billion U.S dollars is wasted in pakistan every year due to lack of proper packing techniques used in pakistan are 100years old. The advances in the techniques of processing have given brtter input to the growth of fruit industry . The mango fruits are used and processed in various ways, e,g mango juice, mango slices, powder, candied pulp, jam , paste, jelly , squashes , chutney, preserves, cider , ketch up, and pickles. The ripe fruits used in cooking. The juice . particularly of the fibrous cultivars, is squeezed out and dried on plates.

In Pakistan many indigenous varieties are consumed at their peaks in summer seasons . These include sindhri, Chonssa, Almaas, etc. These varieties are commonly available one after the other in summer season. However each variety takes over the consumption after it reaches the market. However the consumption of sindhri is the highest among all other indigenous varieties.

The mango p[roduce in Pakistan are of the best exportable quality. The demand of mango priduction is increasing every year . However these mangos are already exported to several foreign countries. These mangos sre packed properly in the wrapping papers and then in wooden boxes .Scientist are however conducting research to extend the shelf life of freash mangos to fulfill the demand of the increasing population which is still going on to extend the shelf life of mangos.

Deep rich and well drained soils give the best production and fruit quality. Mango is best adopted to hot, dry leeward areas that receive less than 60 inches of rainfall annually, but supplemental irrigation is desirable for highest yields in those areas.

Some scientists recommended in Pakistan recommended 100kg of fym to a bearing tree, or 2 kg of N per tree in three doses 500g in January, 500g in March, and 1000g per tree in August after harvesting. For young trees, both in Punjab and Sindh, only fym manure is recommended, at a rate of 5-10kg per plant.

Objectives

This project is carried out with the following objectives.

1. To know the best media for mango seed germination.
2. To know the best depth for mango seed germination.

METHODS AND MATERIAL

The research study "Mango seed germination in different media at different depths" was conducted in Jabban, Dargai MKD Agency in collaboration with Deptt of Agri Extension during 2010. Fresh mature and healthy depulped seeds of mango variety were obtained. The mango seeds were sown in four different media at three different depths. The experiment was conducted in two factors RCBD with split plot arrangement and the experiment was replicated three times to minimize the experimental error.

The following treatments were applied in the experiment.

Factor A (growing media)

1. Farm soil (control)
2. Farm soil+ sand
3. Farm soil+sand+fym
4. Farm soil+sand+fym+saw dust

Factor B (sowing depths)

1. 2.5cm
2. 5cm
3. 7.5cm

Data were recorded on following parameters.

Days to germination

Numbers of days from the date of sowing to germination were counted for each treatment in each replication and their average was calculated.

Number of leaves

Numbers of leaves of ten plants selected randomly were counted for each treatment in each replication, at the time when the color of leaves turn from brown to green and their average was calculated.

Shoot length (cm)

Shoot length of ten plants were taken with the help of measuring tape which was selected randomly for in each treatment in each replication from the soil surface to the shoot tip and their average was calculated.

RESULTS AND DISCUSSION

Days to Germination

The data pertaining to days to germination is given in table-1 and the analysis of variance is given in table-1a. According to the statistical analysis of variance effect of different depth on days to germination is highly significant.

Table-1 shows that maximum days to germination 22.25 were recorded by the treatment in which sowing was done at the depth 5cm followed by 20 at depth 2cm while minimum days to germination 18.833 were recorded at the depth 7.5cm.

Similarly according to statistical analysis of variance the effect of media on days to germination is highly significant. The data presenting the effect of different media on days to germination revealed that the maximum days to germination 22.778 days were recorded at soil media followed by soil+sand media 21.667 days soil+sand+fym 18.556 days and minimum days to germination were recorded in soil+sand+fym+saw dust 18.44. The statistical analysis of data shows that the effect of media and depth on days to germination is highly significant but their interaction is non significant.

Table-1

Media	Depths (cm)			Means
	2.5	5	7.5	
Soil	22.667	25.0	20.667	22.778 a
Soil+sand	20.667	23.667	20.667	21.667 b
Soil+sand+fym	18.67	20.00	17.00	18.556 c
Soil+sand+fym+saw dust	18.00	20.33	17.00	18.44 c
Means	20.00 b	22.250 a	18.833 c	

Number of leaves

Is given in table-2 and analysis of variance is given in table-2a. According to statistical analysis of variance effect of different depth on number of leaves is highly significant. Table-2 shows that maximum number of leaves was recorded 6 at the depth 7.5cm and followed 5 at depth 2.5cm while minimum number of leaves 4 was recorded at the depth 5cm.

Similarly the effect of media on number of leaves is highly significant on number of leaves.

Table-2 shows that maximum numbers of leaves were recorded 6 in media soil+sand+fym, followed by 5 soil+sand, soil+sand+fym+saw 4 dust while minimum number of leaves 3.67 were recorded in soil media.

The statistical analysis of the data shows that the effect of media and depth on number of leaves is highly significant and there is non significant.

Table-2

Media	Depth cm			Means
	2.5	5	7.5	
Soil	3.667	2.33	5.00	3.667 a
Soil+sand	5.667	3.33	5.33	4.778 a
Soil+sand+fym	5.667	4.33	6.667	5.556 b
Soil+sand+fym+sawdust	4.0	3.0	5.0	4 b
Means	4.750 b	3.250 c	5.5 a	

Shoot length

The data pertain to shoot length is given in table-3 and analysis of variance is given in table-3a. according to the statistical analysis of variance effect of different depth on shoot length is highly significant.

Table-3 shows that maximum shoot length 6.5cm was recorded at depth 7.5cm and followed by 4.750cm at depth while minimum shoot length 3.833cm was recorded at depth 5cm.

Similarly the statistical analysis shows that the effect of different media on shoot length is highly significant.

The table-3 shows that maximum shoot length 5.556cm was recorded in soil+sand+fym followed by the soil+sand+fym+saw dust 5.34cm and soil+sand 4.667cm while minimum shoot length was recorded in 4.56cm in soil.

The statistical analysis of data shows that the effect of media and depth on shoot length is highly significant but their interaction is non significant.

Table-3

Media	Depths cm			Means
	2.5	5	7.5	
Soil	4.667	3.33	5.667	4.556 c
Soil+sand	3.33	4.33	6.33	4.667 b
Soil+sand+fym	5.667	4.0	7.0	5.556 a
Soil+sand+fym+saw dust	5.33	3.667	7.0	5.333 c
Means	4.750 c	3.833 b	6.500 a	

Recommendation

Mango seed sowing is recommended in media soil+sand+fym at depth 7.5cm in the light of this experiment.

LITERATURE CITED

- A W Whiley, S K Smith. 1999. effect of temperature on seed and fruit development of three mango.
 A. Roy. V. M. Medina and M. K sounduri 1980. the effect of different type of emasculation on mango (magnifera indica).
 Abdel , A I .2006. Evaluation of different mortypes of mango (magnifera indica) Record Number SD2008000067.
 Ali, N., and M.D Khan.1974. The mango in Punjab.Revised Tech. Bull.22, 38 p. Agricultural statistics of Pakistan. 1983. Food and agriculture division, government of Pakistan, Islamabad.

- Barbosa, C., C. Rois, D. Flores, I. Perez-flores, Fernandez and I. Ponce. 2004. Comparison of seed germination in magnifera haden and manila varieties. *Ishas acta horticulture* 820; international mango symposium.
- Cheema, G.S., S.s.bhat, and K.G. Naik. 1954. Chemical analysis of mango fruits. *Commercial fruits of India*. Macmillan and co. LTD., London. Calcutta. Bombay. 108 p.
- Dafa alla. 2002. The effect of stage of seed development and maturity on germination percentage, number of days required for emergence of seedling and weight of mango (*Magnifera inidica*).
- Duran V.H.A. Martinez raya and J.A. Ruiz. 2004. Effect of salinity on yield of mango (*Magnifera indica* L. Cv. Osteen) *europ.J.Of agron*. Vol 21(3) 323-334
- Hayes, W.B., 1960. The mango. *Fruit growing in India Allahabad agr.res. inst.india*, 190 p.
- Javier, F.B. True-to-type propagation and nursery management of carabao mango *ishs Acta horticulture* 455; v international mango symposium.
- Jing-hao Huang, Weil-hong Ma, Guo-Lu Liang. 2009. Effect of low temperature on sexual reproduction of Taiong mango.
- Khan, L. K. 1978. Fruit production in Pakistan. *Punjab fruit J.* 36(1/2):35. Decomposition Zimbabwe. *Soil biology and Biochemistry* Volume 32, Issue 8-9, 1 August 2000, Pages 1111-1119.
- Mahmood B, 1989. Effect of different wrapping materials and calcium carbide treatment on physico-chemical characters of mango. *MSC.Thesis. dept of hort. Univ of Agri, Faisal abad*
- N. Ssukivibul, A. Martinez raya and J. A. Ruiz. 2005. The effect of temperature on seed and fruit development of Irwin Kensington and "Nam Dok mai" mangos (*Magnifera inidica*).
- Nzekwe, U., S.S. C. Onyekwelu and V. C. Umeh. 2002. Improving the germination of *Irvingia gabonensis* var. *excelsa* se Musvoto, C.m B. M. Campbell and H. Kirchmann.
- Rc Mbkwé, S.S.C Onyekwelu and V. C. 2004. Seed germination of depulped and un depulped fruits of bush mango. *Irvingia wombola* (venicosen).
- Singh K.K and K.L. Chadha 1961. Factor effecting the vitamin C content of mango. *PB.Hort.J.*, 1:171-9. (*hort.abst.*, 33(3): 6223; 1963)
- Srivastava K.K., Sharma M K., Sounduri A. S., M. S Wani and Sing S. R. 2008. Response of seed size, storage condition, media and sowing time on seed germination and subsequent growth of chestnut (*Castanea sativa* Mill) seedling.
- Theodore T. Kozlowski and S. G. Pallardy (1997). Seed germination and seedling growth control in woody plants. Page 14-72
- U. Lavi, E. Tomer, S. Gazit. Breeding of mango cultivars and Rootstocks. 1995. *INTERNATIONAL mango symposium ISHA Acta Horti* 291
- Verma and Bajpai. 1971. The effect of temperature on mango skin and colour.
- Zia. 1976. The study of sugar level in mango under several storage conditions.