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Effect of Rootstocks on "Tartarian" Cherry Grown in Balochistan

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ABSTRACT

Effect of two rootstocks *viz.* Colt and Mazzard on Cherry cultivar Tartarian was studied. Rootstock Colt came to full bloom two days earlier, one day earlier for leaf sprouting; whereas, no difference in time of fruit set was found. Rest of the parameters like number of fruit set, fruit drop, yield and total soluble solids were significant except proper stage of maturity and skin color of fruit were found non-significant among cultivars.

Key Words: Rootstock; Cherry; Leaf sprouting

INTRODUCTION

Cherry (*Prunus avium* L.) is a leading fruit of temperate zone in Pakistan. It belongs to the family "Rosaceae". It has been described in 300 B.C. and probably had been grown, primarily for its wood rather than its fruit, several centuries earlier. There are two main types of cherries, the sweet (desert) and the sour. The cultivation of sweet cherries (*Prunus avium* L.) is taken up on a commercial scale and sour cherries (*Prunus census* L.) are known as cooking cherries. Sweet cherry tree is tall with fruits of different shapes and color *viz.*, globular, some what depressed or heart shaped, yellow or red. Sour or cooking cherries are usually used for making jam or cherry brandy in Europe.

The duke cherries, intermediate in type, are to be hybrids between the sweet and sour groups. Other species of cherries have not produced cultivars which are grown extensively on a commercial scale for their fruit. Several of the Japanese species of cherries are grown widely for ornamental purposes in the United States. The Bird cherry (wild sweet) is valued only for its wood. The western wild cherry (*Prunus besseyi*) is used as a dwarfing stock for plum, prune and peach but not for cherry.

In Pakistan: Quetta, Pishin, Ziarat, Kalat, Zhob, Mastung, Loralai and Swat are ideal places for commercial cherry growing. The following three different rootstocks are used for the cherry propagation: i) Seedling strains of *Prunus avium* L. known as Mazzard, ii) Seedlings of the wild European Species *Prunus mahaleb* L., and iii) Stock on Marcello suckers a clone of *Prunus cerosus* (Colt).

The Mazzard rootstock is most widely used and most widely satisfactory. It does not dwarf the trees, forms good union and is moderately tolerant of poorly aerated soils. Mazzard roots are as tolerant of wet, poorly aerated soils as peach, almond or apricot roots. Mahaleb rootstock in the trade was formerly collected from wild trees in France and Italy. This rootstock is convenient for nursery but is not tolerant of wet soils and in same situations trees on it do not live as long as trees on Mazzard rootstocks. Mahaleb seedlings are highly variable in form and growth. Colt rootstock for cherry is a clonal rootstock developed in England. This rootstock is used because it is resistant to soil born diseases and poorly aerated soil better than Mazzard rootstock.

Keeping in view the economic and dietary importance of cherry crop, a research work on effect of rootstocks on time of flowering, fruit drop, yield and quality of "Tartarian" cherry variety, was carried out to study the suitable rootstock and productive scion cultivar for northern Balochistan.

MATERIALS AND METHODS

This research was conducted at Horticultural farm, Deciduous Fruit Development center, Quetta (Balochistan). The experimental design was laid out on RCBD, which included two rootstocks (Colt and Mazzard) and one cultivar Tartarian of 11 years old uniform trees all the trees were spaced evenly (15 x 20 ft), trained to central ladder system and had been grown using standard commercial cultural practices were selected for the experiment.

Characteristics of rootstocks. Colt rootstock for cherry is a clonal rootstock developed in England Colt is a semi-dwarfing rootstock and can be propagated easily. It is compatible with both tarts and sweet cherries one of the disadvantages of this rootstock is that it is highly susceptible to crown gall disease. This rootstock is used because it is resistant to soil born diseases. It does better on poorly aerated soil than Mazzard rootstock.

Mazzard rootstock is characterized by large leaves and by strong vigorous spreading root system that carries many fibrous roots and is dark brown in color. It is a vigorous growing rootstock and produces large long-lived trees with both the sweet and most of the sour varieties worked upon it.

Time of flowering was noted visually when the tree opened more then 80% flowers. There were still some unopened flowers but the trees in a general view were looking in full bloom. Time of leaf sprouting was observed visually when maximum number of leaf bud sprouted. For time of fruit setting, a few days after full bloom the flowers shed their petals and the ovaries started swelling. When this stage was observed in maximum flowers then the time of fruit set was noted.

Percent fruit set was recorded in each cultivar. First of all branches of every replicated tree of each rootstock were marked with paint from four different directions of equal diameter and length, designated East, West, North and South and then the average was calculated.

Data on pre-harvest fruit drop were noted by counting pre-harvest fruit drop in cherry trees every alternate day till harvesting. Data on determination of proper stage of maturity were determined by color of the fruits. The fruits were checked when they attained enough color for picking and then days were counted. Data for recording the yield of different cultivars total fruit of each tree was harvested and weighed in kilograms.

Skin color. Color of the cherry fruit skin was noted with visual reading of the fruit randomly selected from every replicated tree of each cultivars. Key for skin color was at the scale (1-5), i.e. 1= Pale yellow, 2= Light pink, 3= Dark pink, 4= Medium maroon, 5= Deep maroon

Total soluble solids. Data on total soluble solids were noted with the help of refractometer. Data were noted of five selected fruits of every replicated tree of each cultivar. A drop of juice of the fruit was dropped on the plate of refractometer then the reading was noted.

RESULTS AND DISCUSSION

Time of flowering. The cultivar tartarion budded on Colt rootstock reached first to full bloom on April, 9, while on Mazzard rootstock the cultivar Tartarian reached to full bloom on April, 11. Early or late flowering may by due to the difference in chilling requirements of different cultivars. If there is less chilling requirement for a cultivar or rootstock then blooming will be early and if there is more chilling requirement then the blooming will be late. These results are in conformity with those of Elek (1974).

Time of leaf sprouting. The cultivar Tartarian budded on Colt rootstock sprouted maximum leaves April 3, while the cultivar Tartarian budded on Mazzard rootstock sprouted maximum leaves on April, 4, the data is non-significant because only one day difference for leaf sprouting was recorded between the two rootstocks. Early or late leaf sprouting may be due to rootstock characteristics, which is somewhat in consonance with the findings of Webster and Shepherd (1984).

Time (date) of fruit set. The cultivar Tartarian set fruit on the same day i.e., April 18, budded on both rootstocks Colt and Mazzard. So, no significant difference was found between the two rootstocks for time (date) of fruit set.

Percent fruit set. Higher fruit set for cultivar Tartarian was noted in rootstock Colt (128.06); whereas, lower fruit set was noted in rootstock Mazzard (98.75). Number of fruit set showed significant difference among the rootstocks (Table I). Increase in number of fruit set is a character of cultivar. Some cultivars produce more flowers per branch while some less. Majority of cherry cultivars are cross-pollinated and in general fruit set is increased by cross pollination. The more fruit set in a cultivar may be the availability of good pollinizer or the cultivar is self-fruit full. It may be due to rootstock characteristics. Parnia *et al.* (1985) and Claverie (1985) reported similar results.

Fruit drop. The data regarding the effect of two different rootstocks on fruit drop of cherry cultivar Tartarian is given in Table I. The difference between the rootstocks was non-significant, however lower fruit drop per tree was noted in rootstock Mazzard (52.99) while higher fruit drop per tree was noted in rootstock Colt (54.99). Draganesses and Predescu (1986) reported that fruit yield was positively correlated with fruit set and canopy volume.

Table I. Effect of two different rootstocks on the number of fruit set, fruit drop, proper stage of maturity, yield, skin color of fruit and total soluble solids of cherry cultivar tartarian

	Rootstocks	
Cultivar tartarian	**Colt**	**Mazzard**
No. of fruit set	128.06	98.75
Fruit drop	54.99	52.99
Proper stage of maturity	40.45	39.58
Yield	24.49	14.37
Skin color of fruits	4.55	3.65
Total soluble solids	18.28	22.59

Proper stage of maturity. The data regarding the effect of two different rootstocks on the average days to maturity on cherry cultivar Tartarian is given in Table I. It is evident from data that difference between the rootstocks was non significant. Lesser days to proper maturity (43.36) were noted in rootstock Colt while more days to proper maturity (43.69) were noted in rootstock Mazzard. Less days or more days for maturity between rootstocks may be due to increase or decrease in number of leaves and time of fruit set there was no significant effect of rootstocks on the stage of maturity. Ninkaviski *et al.* (1989) reported different flowering dates, ripening dates, yields, fruit size and fruit weight for 13 cultivars and calculated that late flowering and late ripening variety gave the highest yield.

Yield. Data regarding the effect of two different rootstocks on the yield of cherry cultivar Tartarian are given in Table I. It is evident from the data that difference between two rootstocks is significant. Higher yield for Tartarian (24.49 kg/tree) was recorded in rootstock Colt while lower yield for Tartarian (14.37 kg/tree) was recorded in rootstock Mazzard. Significant differences were noted in the yield/tree

and their weight in kgs between the different rootstock. Tylus *et al*. (1986) reported that the scion on Mazzard rootstock produced lower yields.

Skin color. Data regarding the effect of two different rootstocks on the skin color of cherry cultivar Tartarian are given in Table I. It is evident from data that difference between two rootstocks was non–significant. However, deeper skin color (4.55) was noted in rootstock Colt while minimum skin color (3.65) was noted in rootstock Mazzard. Nikovski *et al*. (1989) reported variation in flesh color and juice and recommended light colored fruit suitable for processing. Color of fruits fetches more price and attraction of consumers especially maroon color cherry fruit than light pink and pale yellow.

Total soluble solids. Data regarding the effect of two different rootstocks on TSS of cherry cultivar Tartarian are given in Table I. It is evident from data that difference between the two different rootstocks is significant. High TSS for cultivar Tartarian (22.59) was noted in rootstock Mazzard while lower TSS for cultivar Tartarian (18.28) was noted in rootstock Colt. The findings of Sekse (1986) are in conformity with the present results, who has reported that TSS ratio ranged from 17-23.8. Sekse (1986) reported that the result of Mazzard rootstock was better than Colt rootstock.

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