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Effect of Rootstocks on I. Lambert Cherry Grown in Balochistan (Pakistan)

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ABSTRACT

Effect of two rootstocks viz. colt and Mazzard on Cherry cultivar lambert was studied. Rootstock mazzard came to full bloom one day earlier, one day earlier for leaf sprouting and two days earlier for fruit set. Results of fruit set per tree, number of fruit drop and yield of fruits of lambert cherries were found significant on rootstock colt; whereas, rootstock mazzard showed significance in proper stage of maturity and skin color of fruit and partially significant in TSS on lambert cherries. In the light of this study, rootstock mazzard might be recommended for commercial production of cherries in Quetta region.

Key Words: Rootstock; Lambert; Cherry; Pakistan

INTRODUCTION

Cherry (*Prunus avium* L.) is a leading fruit of temperate zone in Pakistan. It belongs to the family "Rosaceae". 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. Cherry fruit develops good quality in cool climates thus areas with good winter rains and dry cool summers are ideal. The better quality and firm cherries tend to be more susceptible to rain cracking than lower quality soft cherries (West Wood, 1978). Cherry trees do not thrive on heavy or poorly drained soils but it does well on sandy loam soil. Cherry needs chilling requirements ranging from 500 - 1300 h (Childers, 1983). Cherries are used for frozen pies and pie filling and for canning, bakeries, ice cream, sauces, preserves and other deserts (Childers, 1983).

In Pakistan: Quetta, Pishin, Ziarat, Kalat, Zhob, Mastung, Loralai and Swat are ideal temperate zones for commercial cherry growing. In Balochistan, cherry is grown on about 897 ha on commercial basis with an annual production of about 1, 507 tons (Government of Balochistan, 2002 - 2003). There are three types of rootstocks, which are used for cherry propagation. They are Colt, Mazzard and Mahaleb. 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 rootstocks were formerly collected from wild trees in France and Italy. This rootstock is convenient for nursery men 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 in this way better than mazzard rootstock.

This study was carried out to investigate the effect of rootstocks on time of flowering, fruit drop yield and quality of" "Lambert" cherry variety.

MATERIALS AND METHODS

This research was conducted at Horticultural farm, Deciduous Fruit Development Center, Quetta Balochistan. The experimental design was laid out on Randomized Complete Block Design, which included two rootstocks (colt & mazzard) and one cultivar lambert with four replications and three plants of lambert variety per treatment totaling 24 number of trees 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 a sweet cherry one of the disadvantage of this rootstock is that it is highly susceptible to crown gall disease. This root-stock 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 than 80% flowers. There were still some un-

opened 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. Number of fruit set per tree was recorded in each rootstock. 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 were harvested and weighed in kg.

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: Scale (1 - 5).

1. Pale yellow
2. Light Pink
3. Dark Pink
4. Medium Maroon
5. Deep Maroon

Total soluble solids data were noted with the help of refrectometer. Data were noted from five selected fruits of every replicated tree of each rootstock. A drop of juice of the fruit was dropped on the plate of refrectrometer then the reading was noted.

RESULTS AND DISCUSSION

Time of flowering. It is evident from Table I that the cultivar lambert budded on mazzard rootstock reached first to full bloom on April 8, while on colt rootstock the cultivar lambert reached to full bloom on April 9. Early or late flowering may be 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.

Time of leaf sprouting. It is evident from Table I that the cultivar lambert budded on mazzard rootstock sprouted maximum leaves April 2, while the cultivar lambert budded on colt rootstock sprouted maximum leaves on April 3. Early or late leaf sprouting may be due to rootstock characteristics, which is some-what in consonance with the findings of Webster and Shepherd (1984).

Time (date) of fruit set. It is clear from Table I that the cultivar lambert budded on colt set fruit on April 20, while the cultivar lambert budded on mazzard set fruit two days earlier i.e. April 18. So, no significant difference was found between the two rootstocks for time (date) of fruit set.

Table I. Effect of two different root-stocks on cherry cultivar Lambert

Rootstocks					
Colt			Mazzard		
Time (date) of full bloom	Time (date) of leaf sprouting	Time (date) of fruit set	Time (date) of full bloom	Time (date) of leaf sprouting	Time (date) of fruit set
April 9	April 3	April 20	April 8	April 2	April 18

Table II. Effect of two different root-stocks on different parameters of cherry cultivar Lambert

Parameters	Rootstocks	
	Colt	Mazzard
No. of fruit set per tree	128.06 a	101.34 b
Number of Fruit drop	61.08 a	53.26 b
Proper stage of maturity (days)	42.42 b	46.99 a
Yield (kg)	22.93 a	16.79 b
Skin color of fruits	2.82 b	4.79 a
Total soluble solids (%)	18.78	19.59

Figures bearing different letters are statistically different at 5% level of significance.

Number of fruit set per tree. The mean data regarding the effect of two different rootstocks for number of fruit set of cherry cultivar lambert are given in Table II. It is obvious from the table that the difference between the two rootstocks was significant. Higher number of fruit set was noted in rootstock colt (128.06), while lower number of fruit set was not in rootstock mazzard (101.34). Increase or decrease 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.

Number of fruit drop. The data regarding the effect of two different rootstocks on number of fruit drop of cherry cultivar lambert are given in Table II. It is obvious from the table that difference between the two rootstocks was significant. Lower number of fruit drop per tree was noted in rootstock mazzard (53.26), while higher fruit drop per tree was noted in rootstock colt (61.08). Similar results were found by Berezenko (1987), while studying on cherry and plum.

Proper stage of maturity. The data regarding the effect of two different rootstocks on the average days to maturity on cherry cultivar lambert are given in Table II. It is evident from data the table that difference between the rootstocks was significant. Lesser days were taken to proper maturity (42.62) were noted in rootstock colt, while more days were taken to proper maturity (46.99) 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.

Yield. Data regarding the effect of two different rootstocks on the yield of cherry cultivar lambert are given in Table II. It is evident from the table that difference between two rootstocks is significant. Higher yield for lambert (22.93 kg/tree) was recorded in rootstock colt, while lower yield for lambert (16.79 kg/tree) was recorded in rootstock mazzard. Significant differences were noted in the yield/tree and their weight in Kg. between the two different rootstocks. 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 lambert are given in Table II. It is evident from the table that difference between two rootstocks was significant. Deeper skin color (4.79) was noted in rootstock mazzard, while minimum skin color (2.82) was noted in rootstock colt 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 cherries.

Total soluble solids. Data regarding the effect of two different rootstocks on TSS of cherry cultivar lambert are given in Table II. It is evident from the table that difference between the two different rootstocks is significant. High TSS for cultivar lambert (19.59%) was noted in rootstock mazzard, while lower TSS for cultivar lambert (18.78%) was noted in rootstock colt. The findings of Sekse (1986) are in conformity with this conclusion as he 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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