Journal of Genetic and Environmental Resources Conservation, 2014, 2(1): 16-21.
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Selection a new apricot cultivars by planting seeds

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Abstract

This research was conducted during 2002-2010 to obtained new selected apricot genotypes via sowing seeds at private orchard in Abu-Ghraib, Baghdad. Seven out individuals of hundred trees were selected for this study, trees that had the desired characters especially total yield, fruit weight, pulp weight, pulp/fruit, length and width of fruit, total soluble solids (TSS) and fruit content of dry matter. Furthermore, some morphological characters as fruit skin, color and shape, pulp adhesion to seed, vegetative growth density and infestation of gummosis. The selected apricot had significant differences in all characters. Selected trees number 6 and 7 were superior in total yield (69.00 and 67.00 Kg trees^{-1} respectively), fruit and pulp weight, length and width of fruit. These selected trees were propagated via shield budding on apricot rootstock to certificate as new cultivars after registering and application of future research.

Key words : Apricot, Selection, Fruit characters, Yield.

Introduction

The most grown apricot *Prunus armeniaca* L. belong to family Rosaceae, and all the types of apricot is diploid and consist eight diosomic (Hormaza, 2002; Ercisli, 2004; Uzun *et al*., 2007), and included early, medium and late ripening varieties which differ from each other in the chilling requirements to overcome rest period and also they diver in tree shape and growth vigor and in the shape, size, color and texture of the fruits (Asma and Ozturk, 2005; Asma, 2007; Ercisli 2009; Uzan *et al*., 2010).

As a result of the mutation, breeding, and selection, there are many cultivars of apricot such as the diseases resistance with high yield and good shape and good size and texture and long yielding season and also a good tolerating chilling requirement for flower buds. (Vachum *et al*., 1999; Bassi 2002; Krska *et al*., 2005). Apricot tree is a temperate zone tree and adopted to grow in different parts in the world, the fruit was a delicious tasty and good nutritional values due to its sugar content and vitamin A and C and some minerals (Dzhangaliev *et al*., 2003; Hussain *et al*., 2010). The fruits can be used as fresh and its founds in the local market at May and it can be used in different products and it can be dried and used throughout the year (Faqir *et al*., 2004; Ercisli, 2009).

The world production of apricot fruits was very low in compared with other fruits in the temperate zone and that is due to very early flowering in the season and the short half-life of apricot fruits and high percentage of fruit decay (Asma, 2007; Ercisli, 2009).

The area under apricot plantation in Iraq was very low and also the average tree yield was very low with low fruit qualities and the spread of low qualities cultivars. So these is a need for introducing new cultivars and initiated a new apricot plantation or select a good cultivars from the established plantation throughout the breeding and hybridization.

The aim of this study was to select a new cultivars by planting apricot seed and select the seedling which represented the standard characters specially the total yield, average fruit weight which is recommended parameters and propagate these seedling by vegetative budding on apricot seedling and replanting in different part of the country.

Materials and Methods

The apricot seed was gathered from ripen fruits from private orchard and cleaned, stored, then cold stratified for one month at 4-5 °C and then planted directly in rows in nursery at March 2002 and when the seedlings was two year old they transplanted in a private orchard in Abou-Ghraib district near Baghdad.

All the agronomic aspects such as weeding, fertilization and irrigation was done to the apricot seedling till the starting of flowering and fruiting of apricot trees where a seven trees were selected and these trees were excellent in their characters and from those tress a 50 ripen fruits from each tree in mid may for 2009 and 2010 to study the following characters:

The average total yield per tree (Kg), average fruit weight (gm), average pulp weight (gm), the percentage of pulp to the fruit according to the

equation pulp weight / fruit weight x100, the average length and width of the fruit (cm), TSS, the average dry matter of the pulp was calculated using 10 gm of fruit pulps and dried in oven at 65 °C till the weight was fixed.

The feature of the fruit such as the color, shape and the agglutinate of pulp to the seed. Tree growth and the gummosis of apricot trees and this was done by visual and at 3 levels such as low, medium and severs for the growth of the trees and for the geomass at two level such as infected or non-infected.

The trees were vegetative propagated using shield budding on the apricot rootstock planted by seeds. The experimental data were analyzed using T test for the differences between the average of two values.

Results and Discussion

The total yield of fruits (Kg.tree^{-1}): Figure (1) shows a significant differences between the selected apricot trees in the average total yield per tree, and the selection 6 and 7 gave the highest average tree yield of 69, 67 Kg.tree^{-1} respectively and those significantly overcome the standard mean, while the yield of the other five selection specially the selection 1 and 4 which gave 10 and 12 Kg.tree^{-1} respectively. This differences between the selections was due to genetic factors as a results of difference gene action with different effect and conceited and complicated and that influenced by genetic and ecological action. The results obtained in this study was in agreement with the results of Slingerland *et al*. (2002); Vachun (2002); Krska *et al*. (2005).

Average fruit and pulp weight (gr): Figure (2) shows that the selected apricot trees were differed significantly when compared with the standard error between the treatments in the average fruit weight and the highest average weight 29.40 gr.fruit^{-1} was in the selection number 7 which was superior than the standard average while the other selections differed between each other's and the ranged between 17.00 gr in the selection number 3 to 24.50 gr in the selection number 1. The decreases in fruit weight was negatively related to the number of fruits in the tree, when the number of fruits in the tree increased the weight of the fruit decreased and that is due to the competition between the fruits.

The selected apricot tree number 7 gave the highest average fruit weight and at the same time the total yield per tree was also higher than the other selection (Figure 1). The average fruit weight was a component of the yield and the increases in average weight will lead to increases in the total yield of the tree, this is can be attributed to the genetic factors which is distinction than the other selections. This results agreed with (Ricciardi *et al*., 2002; Slingerland *et al*., 2002; Dzhangaliev *et al*., 2003; Asma and Ozturk, 2005; Ercisli, 2009) whom founded that the cultivars of apricot differ between each other on the average fruit weight and it can be small, medium or big fruit.

The selection number 7 significantly superior than the other selections in the average weight of the pulp and gave 25.65 gr while the weight was 13.50 gr in the other selection specially in the selection number 3 and that is due to heavy seeds inside the fruit in this selection and due to low average weight of the fruit and this will reflected on the average weight the pulp.

Pulp/Fruit Ratio: All selections differ between them in the ration of pulp/fruit and it ranged between 78.24% to 87.68% in the selection 3 and 4 respectively and that is due to low average fruit weight with respect to the weight of the seed specially in selection 3 and the reverse was happen in the selection 4 (Figure 3).

The average length and width of fruit: Figure (4) shows a significant differences between the selections in the average length and width of the fruits. The highest length of fruit 4.0 cm was found in the selection number 7 while the length was between 3.52-3.81 cm in the other selection. The highest width of 3.97 cm in the 2 followed by selection 7 with 3.85 cm while the lowest with of 2.94 cm in the selection 3. These results is in agreement with (Goffreda, 1999; Kaur *et al*., 2000; Ricciardi *et al*. 2002; Dzhangaliev *et al*., 2003; Pedrye *et al*., 2009).

Total soluble solid (TSS): The fruits from the apricot selections significantly differed between each other in their TSS. The highest TSS was 17.17% in selection 3 followed by the selection 1 in which the TSS was 13.67%, while the TSS was 10.67% in selections 4 and 7 respectively (Figure 5). This is agreed with (Goffreda, 1999) who found that the T.S.S of 15-17% was in apricot fruit of some cultivars and with (Asma, 2007) who found that the T.S.S was 12-14% in the cultivar Alyanak and also the results of this study in agreement with (Ercisli, 2009) who found that the TSS was 11-17% in some apricot cultivars and the results of (Pedryc *et al*., 2004) who found that the TSS was 14-15.90%.

The color and shape of the fruit, agglutinate of pulp to the seed: The fruits from the selection number 1 characterized by a yellow color with a red dots and semi-rounded shape and the pulp was agglutinated with seed. In the selection 2, the color of the fruit is yellow to orange with red dots also the fruits is round and the pulp is not agglutinate with seed, while the color of the fruits from selection 3 was orange with a cylindrical shape and the pulp was agglutinated with the seed. The color of the fruit from selection 4 was yellow to pale orange with red dots and the pulp was agglutinated with the seed.

The color of the fruits from selections 5 and 6 was orange with red dots and the pulp was agglutinated with seed and fruits was semi-rounded and oval respectively. The color of the fruits from selection 7 was orange without the red dots and the shape was semi-rounded and pulp was agglutinated with the seed (Table 1). The differences this characters can be attributed to the genetic factors and that because these selections comes from the propagation by seeds. This results in agreement with (Goffreda, 1999; Slingerland *et al*., 2002; Ercisli, 2009; Pedryc *et al.,* 2009) whom found a differences between the apricot selection and cultivars in these characters.

The density of the vegetative growth of the trees: There is differences between apricot selections in the density of the vegetative growth, some selections was low density such as selections 4, 5, 6, 7 and some other with medium density such as 1 and 3 while the highest density selection was number 2 (Table 1).

This character was influenced by the genetic factors and the results of this study was in agreement with the results obtained by (Asma and Ozturk, 2005; Asma, 2007) whom found that the growth of apricot trees and selections was ranged from medium to high growth.

From this study we can notes that the selections 6 and 7 was the best in most characters under this study specially with the yield, and also the pulp was agglutinated to the seed so that these selections was most suitable for fresh consumption and not for processing and because of the results the two selections was propagated by shield budding on apricot rootstock grown by seeds which are used as recommended rootstocks and these are a good compatibility with most apricot cultivars budded on it and it give the yield earlier (Slingerland *et al*., 2002).This rootstock also grow well in different types of soils. In this study the percentage of budding success which 85% and the budded seedlings was grown in the same area to carry out other studies to study other parameters and grow these selections in other suitable areas in the country.

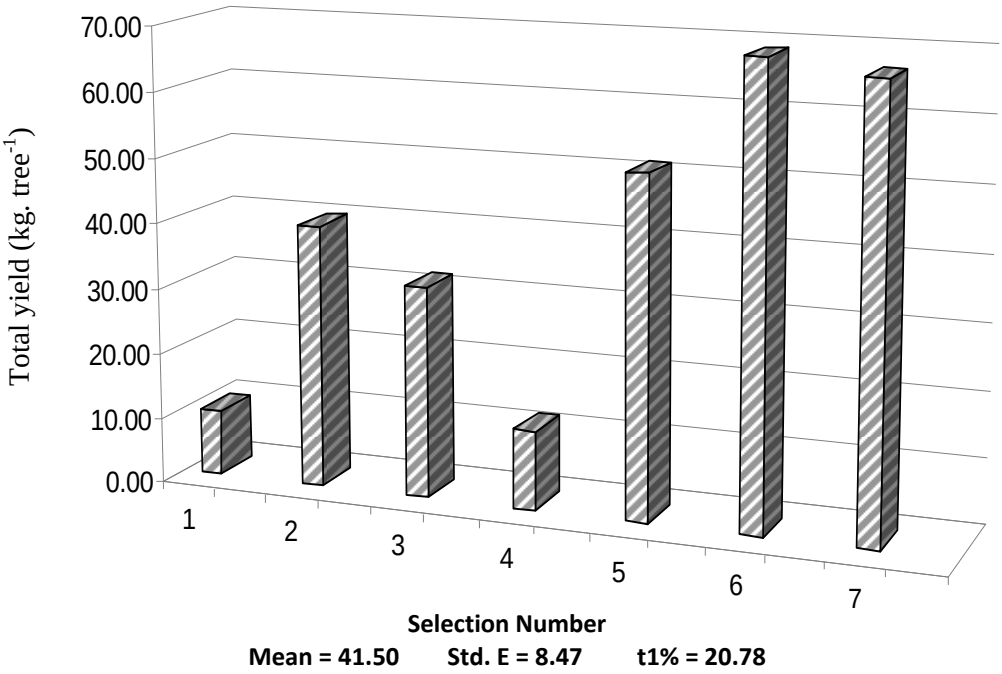

Figure (1): Total yield of fruits (Kg. tree^{-1}) in apricot selection.

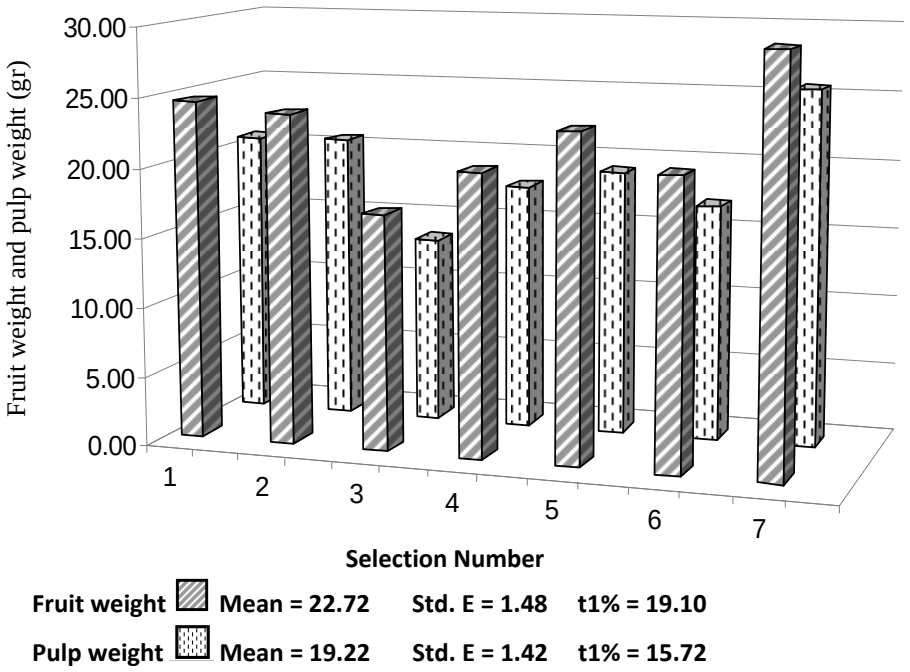

Figure (2): Average fruit and pulp weight in apricot selections

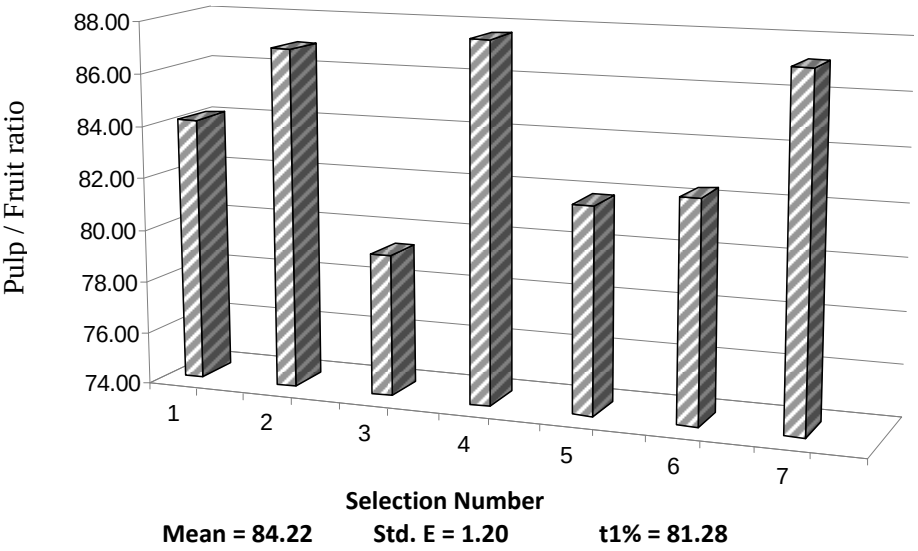

Figure (3): Pulp / Fruit ratio in apricot selections

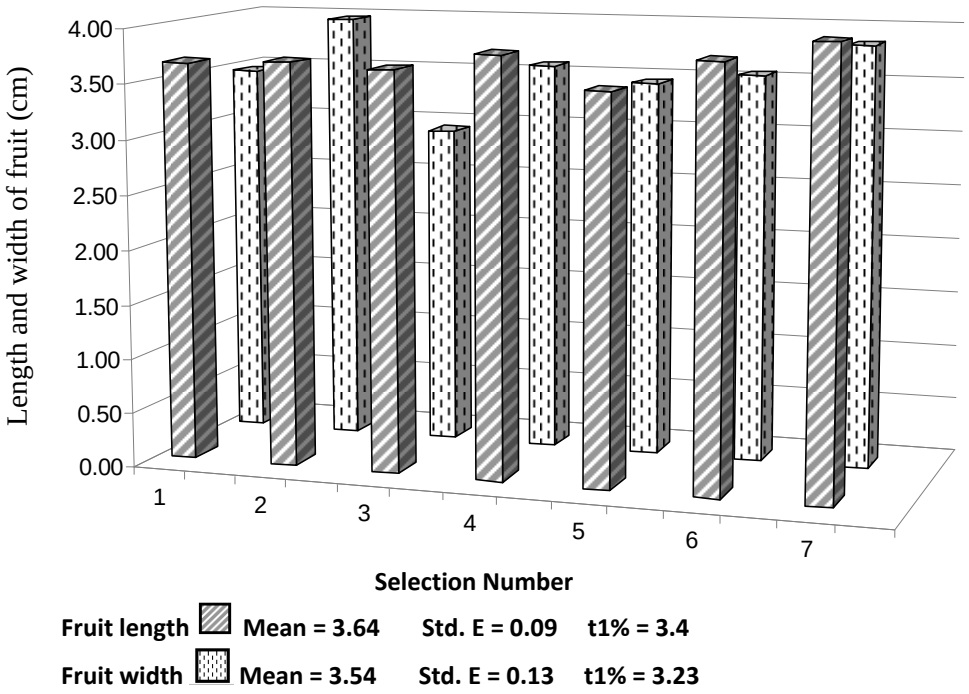

Figure (4): The average length and width of fruit in apricot selections.

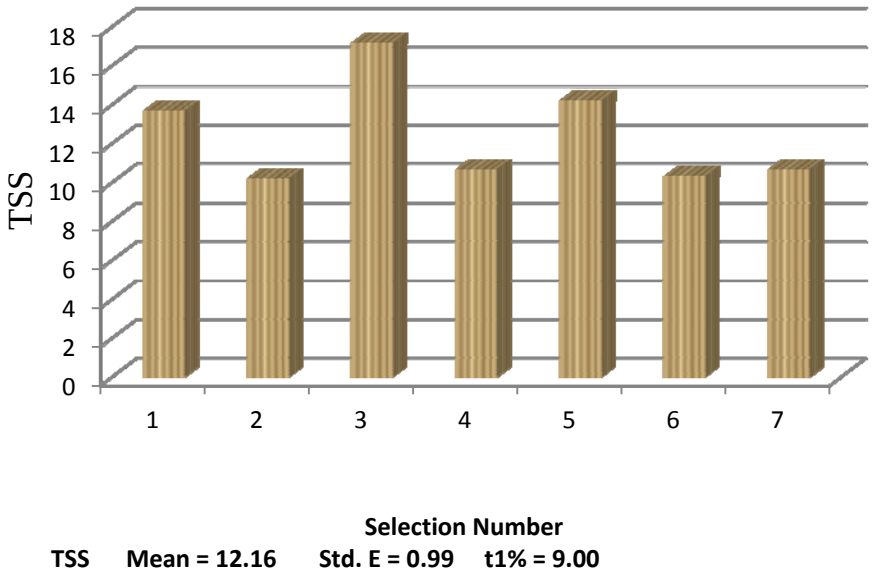

Figure (5): Total soluble solid (TSS) in the fruit of apricot selections.

Table (1): Some fruit visual characters, density of vegetative growth and gummosis for apricot selections.

Selection no.	Fruit color	Agglutinated of pulp to seed	Density of vegetative growth*	Gummosis
1	Yellow with red dots	Agglutinated	++	Infected
2	Yellow to orange with red dots	Non agglutinated	+++	Non infected
3	Orange	Agglutinated	++	Infected
4	Pale orange with red dots	Agglutinated	+	Infected
5	Orange with red dots	Agglutinated	+	Non infected
6	Orange with red dots	Agglutinated	+	Non infected
7	Orange	Agglutinated	+	Non infected

* Low= + , Medium= ++ , High= +++

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