

Effect of Ammonium bicarbonate on growth properties of peach cultivars on GF677 rootstock

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ABSTRACT: This study performed to evaluation of Ammonium bicarbonate on growth properties of peach cultivars on GF677 rootstock. It was conducted in the greenhouse of the Institute of Seed and Plant. Factorial experiment in a completely randomized design applied with two factors genotypes (4 levels) and water bicarbonate (in 3 levels) with three replications. The studied cultivars were JH Hale (susceptible to chlorosis), the Barzegar (resistant to chlorosis) and Red Huns (average) based on GF677 and basic link GF677 (not bond as a control) and potassium bicarbonate factor included of 0 (control) , 15 and 30 mM. According to result, The JH Hale genotype had the lowest growth traits. Control genotype had the highest means. The vegetative traits decreased with increasing bicarbonate treatments; however, this decline in control genotype was far less than other genotypes.

Keywords: Irrigation, Scion, Peach, Rootstock.

INTRODUCTION

Irrigation quality induced range of cultivation (Handreck and Black, 2002). Ammonium bicarbonate is produced by combining carbon dioxide and ammonia also bicarbonate could increase absorption of element such as phosphor and potassium (De La Guardia and Alcantara, 2002). Bicarbonate in the rhizosphere inhibits iron absorption or Iron is absorbed, but it is inactive by bicarbonate alkalinity in root tissue (Romheld, 2000). It was suggested that the sharp decline seen in the growth of shoots, even at low concentrations of bicarbonate, in a message received from the root, like related hormones. The type of rootstock can particularly affect both the vegetative and productive properties of peach plants, and the qualitative and nutritional attributes of their fruit. The GF677 rootstock (*P. persica* × *Prunus amygdalus*) promoted the highest vegetative development. The physiology of the plant responses to salinity and their relation to salinity resistance have been much researched and frequently reviewed (Munns, 1993) However, one problem is that there is still no clear consensus concerning the physiological traits that are primarily responsible for growth inhibition by bicarbonate. Thus aim of this study is evaluation of Ammonium bicarbonate on growth properties of peach cultivars on GF677 rootstock.

MATERIALS AND METHODS

This study was conducted in the greenhouse of the Institute of Seed and Plant. This station is 51 ° East longitude and latitude 35 degrees 48 minutes north and its height from sea level to 1320 meters. The study performed as factorial experiment in a completely randomized design with two factors genotypes (4 levels) and water bicarbonate (in 3 levels) with three replications. The studied cultivars were JH Hale (susceptible to chlorosis), the Barzegar (resistant to chlorosis) and Red Huns (average) based on GF677 and basic link GF677 (not bond as a control) and potassium bicarbonate factor included of 0 (control) , 15 and 30 mM. Some of traits were studied such as Height of Scion, Diameter of Scion, Number of branch and Fresh weight of the entire plant.

RESULTS AND DISCUSSION

Height of Scion: According to ANOVA, it was founded that bicarbonate and genotypes had significant effect on height of Scion, also them interaction had significant effect at 5% statistical level. Between genotypes, GF677 had highest means (109 cm) and application of 15 and 30 mM bicarbonate led to decreasing the height 7 and 14% in compare to control, respectively.

Diameter of Scion: Simple and interaction effect of treatments were significant on Diameter of Scion at 5% statistical level. Highest mean was obtained by GF677 genotype and Barzegar, Red hoven and GH hil showed 3, 32 and 22% reduction in compare to GF677 genotype.

Number of branch: Treatment had significant effect on this trait, highest (11) and lowest (7) means were observed by GH hil and Barzegar genotypes, respectively. Application of 15 and 30 mM bicarbonate led to decreasing the high 23 and 43% number of branch in compare to control, respectively.

Fresh weight of the entire plant: The highest and lowest fresh weight were observed by GF677 and GH hil genotypes, also increasing in bicarbonate level led to decreasing in fresh weight, in other hand, application of 15 and 30 mM bicarbonate reduced fesh weigh by 14 and 29 percent. Alkalinity induced by bicarbonate causes stress and thus reducing photosynthesis in plants and Mineral compounds in plants has changed, cause the toxicity of ionic imbalance (Wahome *et al.*, 2001). According to result of other authors, Bicarbonate reduce photosynthesis and reduction in photosynthesis effect on growth properties (Nagarathnamma, 2006; Ruiz *et al.*, 2000; Luis and David, 2008; Heuer, 2003). The JH Hale genotype had the lowest growth traits. Control genotype had the highest means. The vegetative traits decreased with increasing bicarbonate treatments; however, this decline in control genotype was far less than other genotypes.

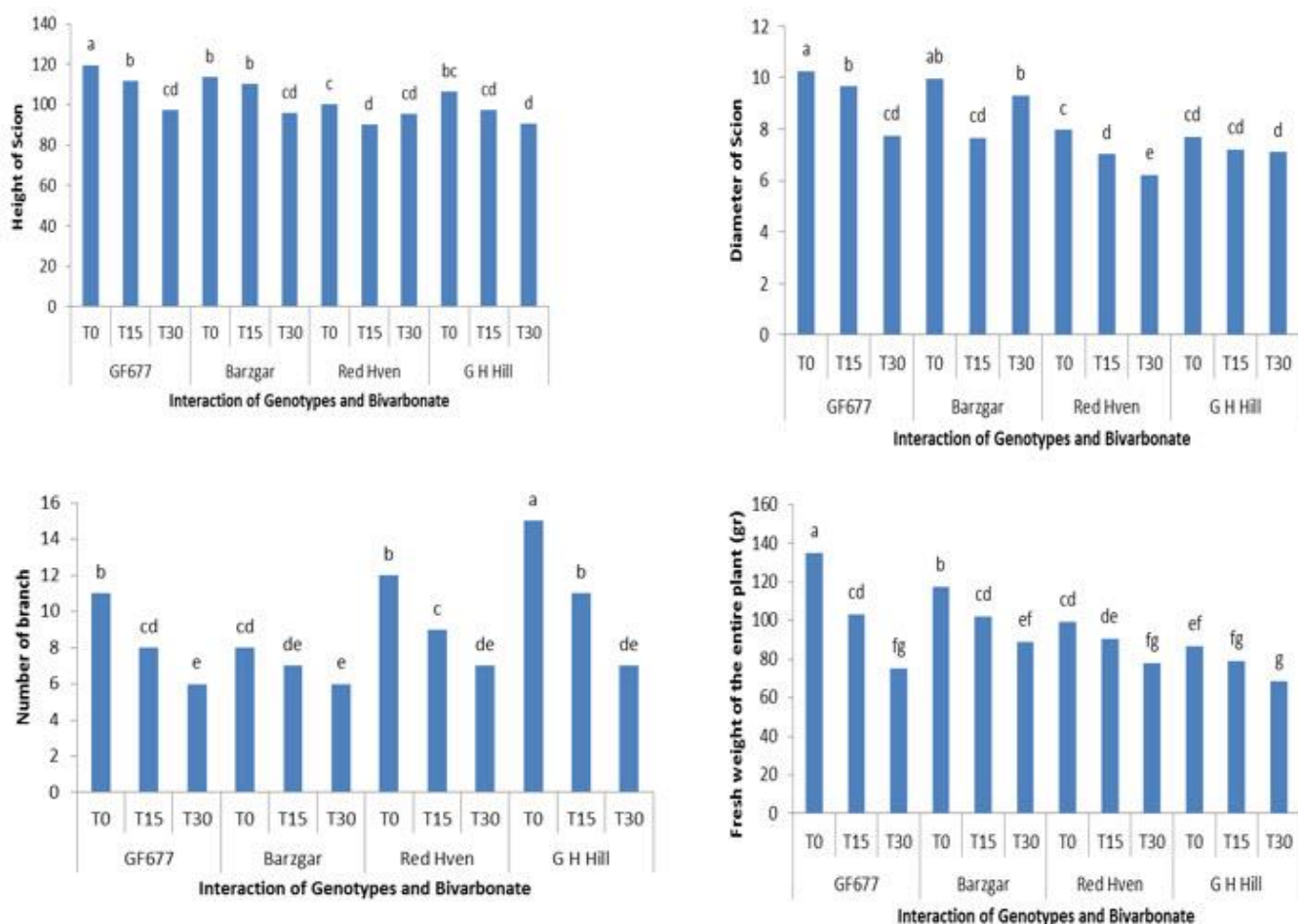


Figure 1. effect of treatments on studied properties and Duncan comparison

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