The 1st International Conference on New Ideas in Agriculture
Islamic Azad University Khorasgan Branch
26-27 Jan. 2014, Isfahan, Iran

USE OF ANN PROGRAM TECHNIQUE FOR CHOOSING THE EFFECTIVE SOIL PROPERTIES ON GROWTH INDEXES OF *Amygdalus scoparia*

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INTRODUCTION

ANNs are computing systems made up of a number of simple, highly interconnected processing elements, also called neurons. Generally, an ANN is made of an input layer, one or several hidden layers (HLs), and an output layer of neurons (Tracey et al., 2011). The input layer neurons receive the input information from the outside environment and transmit it to hidden layer. Each neuron of a subsequent layer first computes a linear combination of the outputs from all neurons of the previous layer and then adds a bias to it(Turan et al., 2011).It is clear, for successful establishment of soil conserving crops, it is necessary to have knowledge about available and sufficient nutrients and soil condition including: texture, P, K, N and soil salinity (Khajeh Abdelahi, 2007). The aim of this study is to investigate of crucial factors on *Amygdalus scoparia* planting.

MATERIALS AND METHODS

The study area was part of the Zob-Ahan factory, Isfahan, Iran, which is located in 51° 15″ to 51° 25″ E longitude and 32 °25 ″to 32 ° 32″ N latitude, central Iran. The average temperature varies between -12.5 and 40.7°C. The average height of sea level and rainfall are about 1692 m and 169.5 mm, respectively.At the first stage, the study points determinated by GPS and aerial photos. Soil samples were collected from 0-30 and 30-60 cm. All analyses were done by APHA (1995). The soil properties that measured in upper and lower soil layers show with 1 and 2 indexes (i.e. pH_1 as pH of 0-30 cm soil layer) Also, height and width of plants measured in meter scale randomly whiles, *Amygdalus scoparia* is the dominating tree species. The statically analysis was done by Application Clementine 12.0 (Artificial Neural Network program).

RESULTS AND DISCUSSION

ANN model with soil properties and growth indexes of *Amygdalus scoparia* data would be predicated that pH_2, $Silt_2$ and K_2 with 0.11 variable importance has highly effective on width of plant whereas EC_2 (variable importance= 0), $Gravel_1$,K_1,$sand_1$ and $silit_1$ with 0.01 variable importance have the less effects on width target of *Amygdalus scoparia*. Other soil properties like P_2 (variable importance=0.1), pH_1, calcium carbonate equivalent (CCE1) with variable importance=0.09 and OM_2, $clay_2$, $gravle_2$, EC_1, $sand_2$, OM_1 are been in the middle of this order, respectively. On the other hand, the soil properties of lower layer like $sand_2$, $clay_2$, OM_2, CCE_2 with variable importance between 0.09-0.08 have the most effects on plant height. Although soil properties of upper soil layer) like pH_1, EC_1, CCE_1 are been in the end of this category with variable importance between 0- 0.01. Other study soil properties as K_1, P_1, $silte_1$, $sand_1$, OM_1 percentages are following the effective parameters on plant height of *Amygdalus scoparia*.

Overall, we can see that growth indexes of *Amygdalus scoparia* are more under influence of soil properties of lower soil layer because of root density in this layer. Also, chemical and fertilizer soil properties are more effective on width of plant whereas physical and structural soil properties are influence on plant height of *Amygdalus scoparia.*

Keywords: ***Amygdalus scoparia*** , Soil, ANN.

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