

P-49 (213)**BREEDING OF WALNUT ROOTSTOCKS IN IRAN****Prof. Kouros Vahdati**Department of Horticulture, College of Aburaihan, University of Tehran, 20th km of Imam Reza Blvd., Pakdasht, Tehran, P.C. 33916 53755, Iran; kvahdati@ut.ac.ir (Presenting author)**Assoc. Prof. Darab Hasani**, Institute for Horticultural Research, Karaj, Iran; Reza Rezaee,**Mohammad Mozaffari, Mahdi Mohseniazar, Mohammad Mehdi Arab, Mohammad Sadat****Hosseini Grouh, Naser Lotfi, Mohammad Javad Mahmoodi Meymand, Amir Rezaei, Ata****Dejahang, Ali Sheikhbeig, Fatemeh Rezaei, Mansoureh Nazari, Alireza Solooki, Behrad****Mohajer** (co-authors)

Walnut rootstocks breeding in the world is very young. The main breeding objectives of walnut rootstocks in Iran include tolerance to abiotic stresses and vigor. Improvement of rootstocks has been pursued through traditional breeding and biotechnology methods. Horticultural Sciences Research Institute studied compatibility of different species of walnut and concluded the highest vigor on *Juglans nigra* rootstock. Among the *J. regia* genotypes, Z30, Z67, AZ2, AZ1, YAD and Kh.1-h3 had the highest vigor and germination. To study dwarfness, seeds of compact walnut genotypes were collected from all around Iran in Aburaihan campus of University of Tehran. Selected dwarf rootstocks were precocious, cluster bearing and easy to root. We select 15 genotypes from more than 900 genotypes after 4 years phenotyping. Selected dwarf and semi-dwarf rootstocks were precocious, cluster bearing and easy to root. Also we could select some lateral bearing and low-vigor genotypes as scion. To study tolerance to drought and salinity, walnut genotypes were collected from semi-arid regions of Iran that were affected by drought stress in different years and treated by different treatments at germination and seedling stages. The results indicated that Kerman 11 and Kerman 13 are drought tolerance. In current study 15 genotypes were selected among 150 promising genotypes. Genome-wide association study for introducing molecular markers for drought tolerance in walnut is ongoing. Genetic engineering was also applied using *fld* and *badh* genes for tolerance to drought and salt stresses. The preliminary results revealed more tolerance in transgenic shoots in compare to wild genotypes. Line 4, Line 13 and Line 17 showed drought and salinity tolerance in comparison with wild type line under in vitro condition.

Keywords: *Juglans*, Breeding, Rootstock, Drought, Dwarf, Vigor, Salinity