Characterization of walnut genotypes for production of hybrids: a case study in Italy

Paola Pollegioni[1], Fulvio Ducci[2] and Maria Emilia Malvolti[1]
[1]CNR-Institute Agro-environmental of and Forest Biology
[2]CRA- Institute of Forestry

Juglans regia (L.), Persian walnut, and *Juglans nigra* (L.), black walnut, are economically important species cultivated throughout the temperate zones of the world. *J. regia,* indigenous species in Eurasia, is used for fruit production and quality wood. *J. nigra*, native in North America, provides good dark wood; it is fast grooving and more resistant to diseases and flooding then *J. regia*. If the condition is suitable the hybridization between the two species can occur naturally. The hybrid plants, *J. x intermedia* (Carr.) generally combine suitable characters of the parental species, as vegetative vigour, disease resistance, good wood quality and winter hardiness. For these reasons there is a great demand for J*. x intermedia* for forestry plantation, especially in Northern Europe.

The selection of *J. nigra* and *J. regia* genotypes with spontaneous crossing ability and the characterization of new *J. x intermedia* hybrids has been the item of our research.

7 *J. nigra* and 48 *J. regia* plants, located in a private park (Northern Italy), were characterised by 10 microsatellite markers.

A triploid genotype (n 48 instead of n 32) was detected.

8 half-sib families from free pollination were then analysed. The fingerprinting of the genotypes (totally 600), allowed the characterization of 198 interspecific hybrid plants.

The Maternal analysis carried out for each family showed 3 *J. nigra* plants able to produce hybrids with different cross efficiency. Also the triploid plant doesn't result sterile but gave rise to *J. nigra* seeds and several (83%) diploid hybrids.

The paternity analysis highlighted a different reproductive success of the *J. regia* father plants included in the population and, as it was expected, a high percentage of external pollination (mean 49.2%).

The obtained results demonstrated the efficiency of the molecular markers for the early selection of genotypes and allowed the identification of *J. nigra* and *J. regia* genotypes suitable for the production of *J. x intermedia* plants.

Maria Emilia Malvolti
CNR- Institute of Agroenvironmental and Forest Biology
V.le Marconi 2
05010 PORANO (TR), Italy
Telephone: +39 0763 374913; Fax: +39 0763 374980; e-mail mimi@ibaf.cnr.it