

## Clonal forestry of chestnut in Northern Spain

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### Abstract

Chestnut clonal forestry was developed in most south European countries since Medieval time being perhaps the European tree with the oldest clonal forestry. Plants selected by their nut and wood quality were and are still propagated by grafting and cultivated in chestnut orchards with differing management depending on the objectives. Chestnut wood is an interesting product used for long term conservation fences, furniture and carpentry. Nuts were used as a basic alimentation product. Although most of the uses of both products have changed, there are deficit of them and chestnut clonal forestry is considered of economic interest. Nowadays chestnut clonal forestry has different modalities because there is the trend of cultivation for a single purpose, wood or nut, although it is not excluded the double objective similar as the traditional orchards.

The damages caused in sweet chestnut populations by several species of *Phytophthora* sp. and by *Chryphonectria parasitica*, known by the name ink and canker diseases respectively, led to the introduction, after 1910, of seeds of Japanese or Chinese chestnut with higher resistance in SW Europe. Some years later, breeding between sweet chestnut and the two Asiatic species was initiated in Spain, France, Portugal and Switzerland to breed the local specie with the resistant genes of the Asiatic ones. In the 1950s research was initiated on clonal propagation by layering, morphological characterization of hybrids and tests of resistance to diseases. By 1960 in Galicia (Spain) was developed a clonal forestry programme with hybrid clones selected by resistance to *Phytophthora* sp. A lot of hybrid clones, by 200, mostly *Castanea crenata* x *Castanea sativa*, were propagated by layering in private and public nurseries. There was information on the nut and trees vigour characteristics about a reduced number of clones (approximately 30) from the collection made by Urquijo but not for other clones. Clonal forestry was promoted during decades with this material. In general it can be said that there was not a clear objective.

By 1999 was initiated at Lourizán Research Centre a programme with the objective of developing the characterization and selection of Galician traditional varieties of sweet chestnut and the hybrid clones obtained three decades before. Main objectives were the identification of genetic markers for the definition of clones and their ancestry, the development of mass propagation by cuttings and micro-propagation, the assessment of resistance to *Phytophthora* by inoculation tests and the plantation of field tests and nuclear stock with well identified material. The first approval of clones according to the European directive on forest reproduction materials was in 2007. A total of 32 clones were approved as belonging to the categories controlled and qualified.