AGROPINE 2011 Meeting conclusions

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The future of Mediterranean Stone Pine requires an effective commercial distinction from other pine seeds and a stable, increased production from agroforestry systems

On 17th-19th November 2011, an *International Meeting on Mediterranean Stone Pine for Agroforestry, AGROPINE 2011,* was held in Valladolid, Spain, organised by the Stone pine sub-network of the FAO-CIHEAM Research Network on Nuts. The meeting brought together about forty experts, researchers, public and private forest managers and land owners, as well as representatives of pine nut processing enterprises from Spain, Portugal, Tunisia, Turkey and Lebanon, with some contributions from France and Chile, in order to review the current state of the art in Mediterranean pine nut production in forests and orchards, and to discuss the challenges of the future.

The **pine nut, the edible kernel of the Mediterranean stone pine, *Pinus pinea*, is one of the world's most expensive nuts**. Although well-known and planted in antiquity, pine nuts are still collected mainly from natural forests in the Mediterranean countries, and only recently has the crop taken the first steps to domestication as an attractive alternative on rain-fed farmland in Mediterranean climates. The Iberian Peninsula accounts for about 75% of the stone pine area in the world, **Portugal being the main pine nut producer, followed by Spain, Turkey, Lebanon and Italy**.

Over the last century, the Mediterranean stone pine has experienced a range expansion, especially in the Southern and Eastern Mediterranean Basin, as well as a large increase in planted area in its countries of origin, both by forest restoration and farmland afforestation. The species performs well on poor soils and needs reduced cultural practices, it is affected by a few pests or diseases and withstands adverse climatic conditions such as drought and extreme or late frosts. It is light-demanding and hence has potential as a crop in agroforestry systems in Mediterranean climate zones around the world, in tree lines such as shelterbelts adjacent to farmland or pastures or in low density orchard plantations.

The **AGROPINE Meeting 2011** presented the current knowledge and on-going research about ecological and silvicultural aspects of stone pine forests in the Mediterranean basin and the management applied for cone production as one of the multiple forest functions, fully compatible with soil and watershed protection, wildlife conservation, and landscape values. The main technological innovation in the past years has been the generalized use of **tree shakers adapted to stone pines for mechanical cone** harvesting, making manual cone collection by tree climbers – a very dangerous job– an obsolete practice.

Another innovation to increment world production of Mediterranean pine nuts is **planting grafted stone pines**, in specific orchards or in agroforestry systems combined with grazing or farming. Plantations on farmland could yield more pine nuts in the future than the natural forests, contributing to rural development and employment of local communities. This “next step” to domesticate this tree allows the specific use of selected genotypes for higher cone yields, obtained after decades of evaluation in grafted multi-site trials.

The greatest interest during the meeting arose in the **round table discussion and revolved around two major problems of the pine nut sector**. The first challenge will be the **more effective control of cone pests**, especially two native cone-boring larvae, the pine cone weevil *Pissodes validirostris* and the pine cone moth *Dioryctria mendacella*, as well as the Western Conifer Seed Bug *Leptoglossus occidentalis*, recently introduced in Europe from Northern America. Damages caused by these insects reduce cone yield considerably in number and quality, and **effective biological and integrated pest control** would considerably improve the economic benefit from stone pines.

The other major problem of the pine nut as a food item is the **prevailing confusion regarding the identification of the product** among traders, consumers, and even public authorities responsible for the control of the food chain. Pine nuts are among the most expensive nuts of the world, with retail prices ranging from 60 to 80 $US per kilogram, but at the same time, due to the limited world production, they are a very minor food product in trade volume. There are more than twenty different pine species with edible seeds around the world, though only the kernels of a few major species are traded on international markets, especially Mediterranean, Chinese and Pakistani pine nuts, whereas American pinyon pine nuts are rarely exported. Nevertheless, **pine nuts from different species, or continents, are often not clearly labelled**, or they are even mingled, leading to consumers' confusion, in spite of very disparate tastes and dietary values. No other pine seed has a similar taste to the genuine Mediterranean pine nut from *Pinus pinea*, nor any other is as rich in protein, 35%, a value similar to raw soybeans. Also the processing quality can differ greatly between species, countries and suppliers, as do prices at origin.

Thus, pine nuts from different species are, and must be, recognized as being distinct products and should be differentiated on the market, as an issue of **consumers' rights** and even of **food safety**. This is specially true for Chinese pine nuts, whose commercial lots have been found sometimes mixed and mingled with seeds from other pine species, some of them even non-edible because of their content in irritant terpenoids and other compounds. The consumption of Chinese pine nuts (especially from *P. armandii*) is the origin of the Pine Mouth Syndrome, an unpleasant bitter, metallic taste disorder that can appear 1-3 days after consumption and lasts for days or even for weeks, sometimes combined with food aversion and other symptoms. Beside these consumer's health aspects, the **lack of traceability and correct product labelling, identifying the botanical species and the country of origin, is a clear incompliance with current legal requirements for food labelling and traceability in Europe** (*Regulation EC 178/2002*), based on principles such as transparency, risk analysis and prevention, the protection of consumer interests and the free circulation of safe and high-quality products within the internal market and with third countries. The stone pine supply chain must comply with these regulations.

The follow-up of the 2011 meeting will take the form of the Stone pine sub-network within the **FAO-CIHEAM cooperative research network on nuts**, an inter-regional network made up of CIHEAM and the Regional FAO Offices FAO-REUR (Europe) and FAO-RNE (North Africa and the Middle East). This Network forms part of the European System of Cooperative Research Networks in Agriculture (ESCORENA). The next plenary meeting on stone pine is scheduled for 2015 in Portugal.

The abstract proceedings and all communications presented at the AGROPINE 2011 meeting can be found on the meeting web page at: www.iamz.ciheam.org/agropine2011.

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