

Résumé / Abstract

## Feedback on the cultivation of perennial species in a paludicultural approach in a Mediterranean peatland

Vittoria GIANNINI – Ecole supérieure Sant'Anna (Italie)

The conventional cultivation of drained peatlands causes peat oxidation, soil subsidence, nutrient loss, increasing greenhouse gas emissions and biodiversity reduction. Paludiculture has been identified as an alternative management strategy consisting in the cultivation of biomass on wet and rewetted peatlands. This approach was tested in the Massaciuccoli Lake Basin (Tuscany, Italy), a coastal floodplain artificially drained for agricultural purposes since 1930, where land reclamation and continuous cropping have contributed to considerable peat degradation and water eutrophication due to phosphorus enrichment of surface waters. An experimental trial was established in spring 2012 with three perennial rhizomatous grasses (PRG) (*Phragmites australis*, *Miscanthus × giganteus*, *Arundo donax*) and two woody species managed as short-rotation coppice (SRC) (*Salix alba* 'Dimitrios', *Populus × canadensis* 'Oudenberg') to provide biomass for various bioenergy supply chains. A conventionally cultivated annual crop (maize) was used as the control. Some years after the plantation, we analyzed the first results in terms of yields, nutrient uptakes and biomass suitability for energy transformation. Based on the obtained results, we realized that the crop choice is the crucial point for the success of paludiculture systems and several different features should be considered to optimize this critical phase. We drew a multi-adaptive framework based on four criteria that should be checked: biological traits, biomass production, attitude to cultivation under soil saturated conditions and biomass quality. The identification of different features within each criteria and the assignment of a specific value (Degree of Suitability) helped in the definition of a rank among species. In our experimental conditions, *Phragmites australis* was the most suitable for the cultivation, nutrients uptake and bioenergy purposes. Among the woody crops, *Salix alba* performed better than *Populus × canadensis* which survived only in a little portion of the paludicultural field.

Projet financé avec le concours de l'Union européenne  
L'Europe s'engage pour le Rhône et la Saône avec le Fonds Européen de Développement Régional

