



PAULOWNIA TREE PLANTING IN SARDINIA (ITALY)

AND ITS EVALUATION FOR AGROFORESTRY SYSTEMS AND SUSTAINABLE LAND USE

Puxeddu M ^{1*}, Marras G ², Murino G ¹

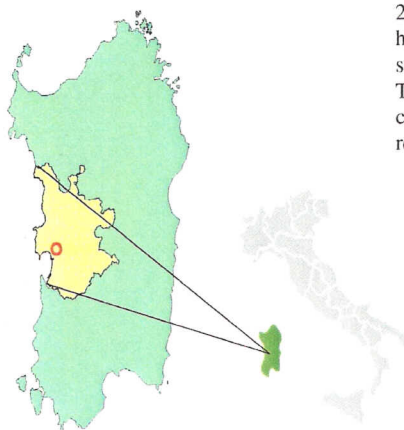
(1) Ente Foreste della Sardegna, v.le Merello, 86 - 09123 Cagliari (Italy)

(2) Dottore Forestale, Oristano (Italy) * Corresponding author: mpuxeddu@enteforestesardegna.it

Introduction

It is known that agroforestry is the integration of trees, crops and livestock on the same area of land and can be applied to all agricultural systems by planting trees on agricultural land or introducing agriculture in existing woodland (Paris *et al.*, 2003). Sardinia (Italy) has a traditional heritage of agroforestry systems and an high potential value for innovative modern agroforestry systems that include on environmental strategies and sustainable land use too. For example, planting *Paulownia* trees could be a beneficial system leading to a low carbon and high biomass productive agriculture in short time, with other specific ecosystems services included flood mitigation, reduction of diffuse pollution and soil erosion, protection of crops and livestock against climatic hazards due to climate change, integrated habitat network and landscape amenities. For these main objectives it appears an essential prerequisite to identify good practices operating in different situations from specific cases. So this work reports about the establishment and the development after two years of a *Paulownia* trees plantation in a large and homogeneous agricultural area, representative as a test site for climate, soil and land use characters, in Campulongu locality, in the countryside of Oristano, Central Sardinia, Italy (Fig. 1).

Fig.1



Materials and methods

The case study concerns a plantation of *Paulownia tomentosa* (Thunb.) Steud. established during the autumn of 2009 on agricultural lands, partially covered by mediterranean vegetation dominated by *Cistus* spp. After the harvesting of vegetation and an intensive cultivation of soil with mediterranean crops, the plants (1+0 bare rooted seedlings) were placed with spacing 3 x 2,5 m (between and within rows respectively) with density of 1333 p ha⁻¹. The observations on the survival and some phenotypic traits of trees after two growing season (Fig. 2-3) were collected on four random plots regarding as total more than 1 hectare. The data were compared with as much as reported on literature (Calvo & De Bonis, 1999; Mezzalira, 2001; Yungying & Zhaohua, 1997).

Fig.2



Fig.3



Results

The results are reported in Fig. 4-5-6. The mortality was 22 %, the average value of basal diameter was 4,4 cm and the average height was 2,1 m (Tab. 1). These first results showed that the role assigned to *Paulownia* trees can be a beneficial system leading to a low carbon and high biomass productive agriculture in short time. Data collection of recurrent monitoring will be basic to confirm this role also in the future.

Fig.4

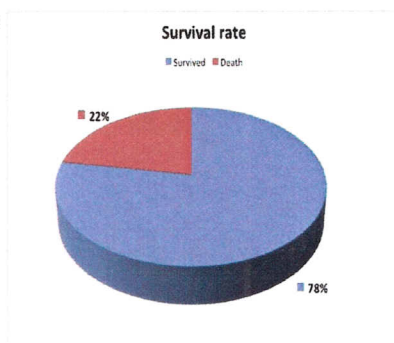


Fig.5

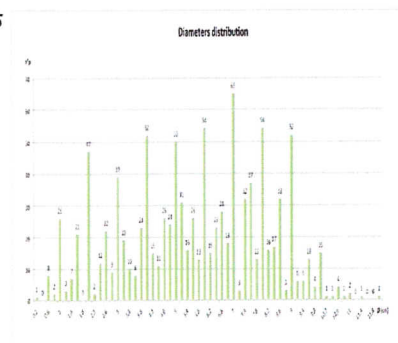
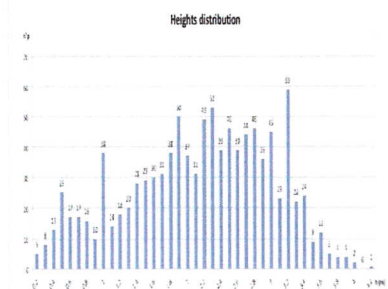


Fig.6



Tab.1

Average values of surveyed parameters			
Density (p ha ⁻¹)	Basal diameter (cm)	Height (m)	G ha ⁻¹ (m ²)
1040	4,4	2,1	3,04

References

- Calvo E., De Bonis P. (1999) - Report sullo stato di attuazione del Reg.CEE 2080/92 nella regione Lombardia negli anni 1993-1997. Sherwood, 46: pp.25-29.
- Mezzalira G. (2001) - La produzione di legno-energia nell'arboricoltura da legno lineare. L'Informatore Agrario, 34: pp.21-25.
- Paris P. *et al.* (2003) - L'agroforesticoltura. In L'arboricoltura da legno: un'attività produttiva al servizio dell'ambiente (a cura di Minotta G.). Avenue Media, Bologna, pp. 142-151.
- Yungying W., Zhaohua Z. (1997) - Temperate agroforestry in China. In Temperate Agroforestry Systems. (Gordon A.M., Newman S. eds). Cab International, Wallingford-NY, pp. 149-180.