III INTERNATIONAL Chestnut Congress

Forte de S. Francisco Hotel
Chaves, October 20-23, 2004
EFFECT OF SOIL TILLAGE ON DIVERSITY AND RELATIVE ABUNDANCE OF MACROFUNGI ASSOCIATED WITH CHESTNUT IN THE NORTH EAST OF PORTUGAL

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European chestnut (*Castanea sativa* Mill.) is a forest tree of great economic interest for wood and fruit production in the north east of Portugal. In order to maintain the soil free of weeds farmers traditionally practice several superficial tillages along the year. Phytosanitary problems mainly related with increasing *Phytophtora cinnamomi* contamination of soils are progressively changing these practices.

The present work intend to evaluate the effect of two different soil management (tillage vs. non tillage) of chestnut orchards on the macrofungi diversity and relative abundance.

Two *Castanea sativa* orchards were selected (one tilled and one non tilled) and five plots of 100m² each were delimited for macrofungi harvesting. During Autumn – Winter of 2003, all mycorrhizal and nonmycorrhizal mushrooms were collected weekly. Identification and quantification of the number of carpophores per species were made in order to evaluate biodiversity and relative abundance of the species.

50 species of macrofungi belonging to 20 genera were identified. Tillage effect could be realized in terms of the number of species. 17 species from 12 genera were harvested in tilled soils, mainly from the genera *Russula, Macrolepiota, Laccaria* and *Inocybe*. Non-tilled soils showed higher number of species (47) and genera (17) and the greater number of species were from the genera *Russula, Inocybe, Cortinarius, Tricholoma* and *Laccaria*.

From the preliminary results here presented we can say that the soil management practices significantly influence the total number of species and the number of mycorrhizal and nonmycorrhizal mushrooms in chestnut orchards.
European chestnut tree (*Castanea sativa* Mill.) have a great economic interest for wood and fruit production in the northeast of Portugal. In order to maintain the soil free of weeds, traditionally, farmers practice several superficial tillages along the year. Phytosanitary practices mainly related with increasing *Phytophthora cinnamomi* contamination of soils are progressively changing these practices. In this context, the present work intend to evaluate the effect of two different soil management (tilleage vs. non-tilleage) of chestnut orchards on the macrofungi diversity and abundance.

**Objectives**

The diversity of macrofungi associated with *C. sativa* Mill. trees (tilled and non-tilled) is represented in Fig. 2. In all plots 50 species, belonging to 20 genera were identified. In the tilled orchard 17 species from 12 genera were observed, mainly from the genera *Russula*. Non-tilled soil showed higher number of species (47) and genera (17). *Russula* was the most species-rich genera, with 11 species. Nine genera were common in the two soils management. *Amanita*, *Mycespa* sp., and *Xerula* sp. were only found in tilled soils and *Boletus*, *Calocybe*, *Cantharellus*, *Hydnum*, *Hypholoma*, *Leotia*, *Lycoperdon* sp. and *Xerocomus* sp. in non-tilled.

**Results**

The total number of species found in non-tilled orchard were significantly greater than in tilled. This difference was more important for mycorrhizal species than for non-mycorrhizal (Table 1). From the total species collected in non-tilled orchard 83% were mycorrhizal and 17% non-mycorrhizal whereas in tilled soils 71% were mycorrhizal and 29% non-mycorrhizal. The two *C. sativa* Mill. orchard showed a similar occurrence in number of fungal species along the harvesting season (Fig. 3).

The number of sporocarps was significantly higher in non-tilled orchard than in tilled one (Table 1). In the first type of management a total number of 29830 sporocarps were collected whereas in a tilled only 3660 sporocarps were observed. With regard to occurrence, we observed that the greatest number of sporocarps occurred in a identical period as the number of species (Fig. 4).

**Conclusions**

- This study has demonstrated that *C. sativa* Mill. orchard provide a habitat for diverse macrofungi communities.
- The number of species, sporocarps and biomass production increased in non-tilled *C. sativa* Mill. orchard and decreased considerably in tilled soils. These changes were found to be statistically significant, especially for mycorrhizal species.

**Effect of Soil Tillage on Diversity and Abundance of Macrofungi Associated with Chestnut Tree in the Northeast of Portugal**

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This study was partially financed by the Project AGRO nº 689 “Demonstração do papel dos macrofungos na vertente agronómica, económica e ambiental. Aplicação à produção de plantas de castanheiro, pinheiro e carvalho”