

Innovative silvicultural treatments to enhance soil biodiversity in artificial black pine stands: monitoring mycological diversity.



ELENA SALERNI¹, PAMELA LEONARDI², ELISA BIANCHETTO³, STEFANO MOCALI³, ISABELLA DE MEO³, PAOLO CANTIANI⁴ & CLAUDIA PERINI¹.

¹Department of Life Science, University of Siena, Via P.A. Mattioli 4, 53100 Siena, Italy; ²Department of Agricultural Sciences, University of Bologna, Viale Fanin 44, 40127 Bologna, Italy; ³Consiglio per la Ricerca in Agricoltura e l'Analisi dell'Economia Agraria – Agrobiology and Pedology Centre (CRA-ABP), P.za D'Azeglio 30, 50121 Firenze, Italy; ⁴Consiglio per la Ricerca in Agricoltura e l'Analisi dell'Economia Agraria – Research Centre for Forest Ecology and Silviculture (CRA-SEL), Via S. Margherita 80, 52100 Arezzo, Italy.

The LIFE Biodiversity project (SELPIBIOLIFE) was presented with the main goal to demonstrate the positive effects of an innovative silvicultural treatment on black pine forests.

1 - SelPiBioLife: the project

Reference	Duration	Budget	Location
LIFE13 BIO/IT/000282	5 years 02-JUN-2014 to 31-MAY -2019	Total budget 1,549,975.00 € EU contribution 768,594.00 €	Tuscany

2 - SelPiBioLife: the idea

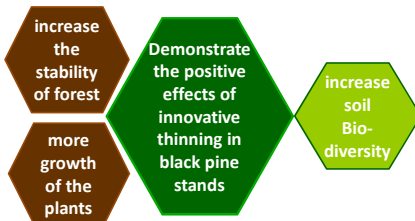
The world's forests play an important role in maintaining fundamental ecological processes, such as water regulation and carbon storage.

Forest canopy is the active interface between 90% of terrestrial biomass and atmosphere.

Soil plays a fundamental role in forest ecosystems: their functionality is closely related to the functionality of the root system, the dynamics of the succession forest and is home to micro- and mesofauna, fungi and plants.

Few researches focus on the effects of forest management on soil biodiversity.

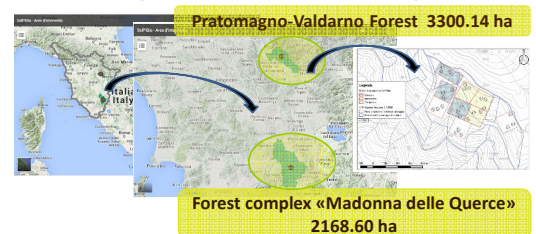
3 - SelPiBioLife: the objectives



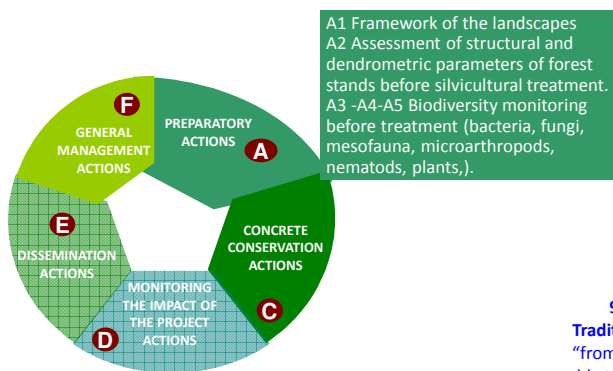
4 - SelPiBioLife:

the coordinator **CRA**
the partners **crea abp**, **Università di Siena**, **Unione dei Comuni Arezzo Val d'Arno**, **Unione dei Comuni Pratomagno**

5 - SelPiBioLife: the pilot areas in *Pinus nigra* woods (localized in Agricultural and Forestal Heritage of Toscana)



6 - SelPiBioLife: the actions



7 - SelPiBioLife: the innovative thinning approach

9 + 9 plots
No thinning

9 + 9 plots
Selective thinning, remove all competitors around 1 strenght tree.

9 + 9 plots
Traditional thinning "from below", is not able to modify crown competition

Approximately 100 strenght trees ha⁻¹
Horizontal and vertical structure of the stand is deeply modified with an influence on the amount of rain and solar radiation.

8 - SelPiBioLife: first results after one year

4. Assessment of the fungal diversity before treatments

	Pratomagno	Madonna delle Querce	Total
N. Plots (314 m ² each)	27	27	54
species richness	106	107	180
No. of carpophores	3481	3220	6704
N. of mycorrhizal species	49	33	72
N. of parasites	1	3	3
N. of humicolous saprotrophs	37	50	75
N. of litter saprotrophs	1	3	3
N. of lignicolous saprotrophs	18	18	27
fresh weight (gr)	35888,04	9044,78	44953,15
dry weight (gr)	4256,87	1134,70	5395,25

The most frequent species:

- Pratomagno**
- ✓ *Russula xerampelina*
 - ✓ *Chroogomphus rutilus*
 - ✓ *Clitocybe nebularis*
 - ✓ *Inocybe geophylla*

- Madonna delle Querce**
- ✓ *Galerina marginata*
 - ✓ *Hemimycena gracilis*
 - ✓ *Mycena arcanangeliana*
 - ✓ *Phellodon niger*

ectomycorrhizal analysis is also under way



9 - SelPiBioLife: work in progress, follow us in the next years on <http://www.selpibio.eu/>