



# Urban Micro-Forests

**MICRO-FORESTS TO BOOST BIOLOGICAL DIVERSITY IN MEDITERRANEAN URBAN SPOTS**

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## BACKGROUND

The micro-forestry method is still little known and practised in Italy. It is a concept that finds its scientific basis in phytosociology, a discipline that studies plant communities and the relationships that are created among them, and between them and the surrounding environment. The objective of the micro-forests is to recreate highly efficient plant communities in terms of development and biological diversity, which in some way reproduce the native associations of natural forests. These are, therefore, not necessarily 'small' forests but rather associations of plant species created in such a way as to reduce forest growth times.

The method takes up the studies of the well-known Japanese botanist Akira Miyawaki, and through the so-called "Tiny forests", has been spread all over the world, establishing itself, especially in European countries such as the Netherlands, as a nature-based reforestation solution particularly suitable for small spaces in urban and peri-urban areas. In our country, few "Tiny forests" have been implemented so far, just as there is little scientific literature on the rooting and growth performance of plantations created using our native forest communities.

The idea that mini-forests capable of providing ecosystem services (shade, oxygen, moisture retention, erosion control) and essential contributions to the conservation of biodiversity can be replicated in densely populated areas is extremely appealing, especially with the increased need for greater liveability and resilience in urban areas and to combat extreme climatic phenomena such as heat waves and flash floods.

According to Miyawaki's studies, the 'Tiny Forests' method is also ten times more time-efficient than the growth of natural forests in Japan. In a 1999 paper, the botanist indicates 10-20 years for the complete maturation of a tiny forest compared to the 150-200 years needed for a natural forest of native species to rebuild naturally.

The Società Botanica Italiana (SBI) intends to verify whether 'Tiny forests' can represent a valid approach for the reforestation of urban and peri-urban areas in Mediterranean cities. SBI, in collaboration with local NGOs, and with the support of TERNA S.p.A, has established three 'urban micro-forests' in the municipal areas of the cities of Rome and Aversa (CE), and will monitor their degree of adaptation to local conditions and their capacity to provide ecosystem services.

## PRELIMINARY ACTIONS

Certain conditions have been met to facilitate the planting of 'micro-forests'. Firstly, a team of botanists from the Sapienza University of Rome studied the local plant communities. Secondly, the soils of the intervention sites were worked and made homogeneous in terms of bio-physical-chemical properties by topsoil milling and the addition in the first 20-30 centimetres of a mixture of soil, organic material and inert material. To avoid extensive soil improvement and ensure as homogenous topographic conditions as possible among the three micro-forests, they will preferably be planted on flat surfaces in urban and peri-urban areas with soils rich in organic matter (i.e. agricultural areas).



## PLANT SELECTION

The species chosen and used for the reforestation project align with the edaphic-phytosociological characteristics of the planting sites and the Mediterranean Bioclimatic Region. Therefore, both shrub and tree species were selected from local genotypes with respect to the intervention areas. The planted seedlings came from germplasm collected in areas of traced origin and bred in a controlled environment in public nurseries, where they grew for 1-2 years to a height of 30-50 cm.

In total, 7 tree species and 11 shrub species were used, making 18 different species.

### TREES

*Quercus cerris* – Turkey oak

*Quercus pubescens* – downy oak

*Quercus ilex* – holm oak

*Quercus suber* – cork oak

*Acer campestre* – field maple

*Sorbus torminalis* – checker tree

*Fraxinus ornus* - manna ash

### SHRUBS

*Ligustrum vulgare* – wild privet

*Prunus spinosa* - blackthorn

*Laurus nobilis* - laurel

*Smilax aspera* - common smilax

*Euonymus europaeus* - spindle

*Rosa sempervirens* – evergreen rose

*Rosa canina* - dog rose

*Pyrus pyraster* - European wild pear

*Cornus mas* - cornel

*Cornus sanguinea* – common dogwood

*Emerus majus* – scorpion senna





## INTERVENTION SITES

The three intervention areas are located in the Municipality of Rome and the Municipality of Lusciano (CE). Specifically, two are located in former agricultural areas of the Agro Romano and one in the area of the former Aversa Asylum in the Municipality of Lusciano (CE).



*Aree Comune di Roma*



*Area Comune Lusciano (CE)*



## AREA "LA MISTICA"

Plot 10 m x 20 m

GPS 41.8847019, 12.5970796



## AREA "LA NUOVA ARCA"

Plot 10 m x 20 m

GPS 41.7769142, 12.5394034



## AREA "NUOVA COOPERAZIONE ORGANIZZATA"

Plot 10 m x 20 m

GPS 14.1911381, 40.9734350





*Soil milling*



*Addition of organic and inert material to the soil*



*Gridding the planting area*



Soil sampling



Planting



Planting site



*Quercus ilex* – holm oak



*Irrigation system with drip emitter and disc of coconut fiber*



*Micro-forest accomplished*