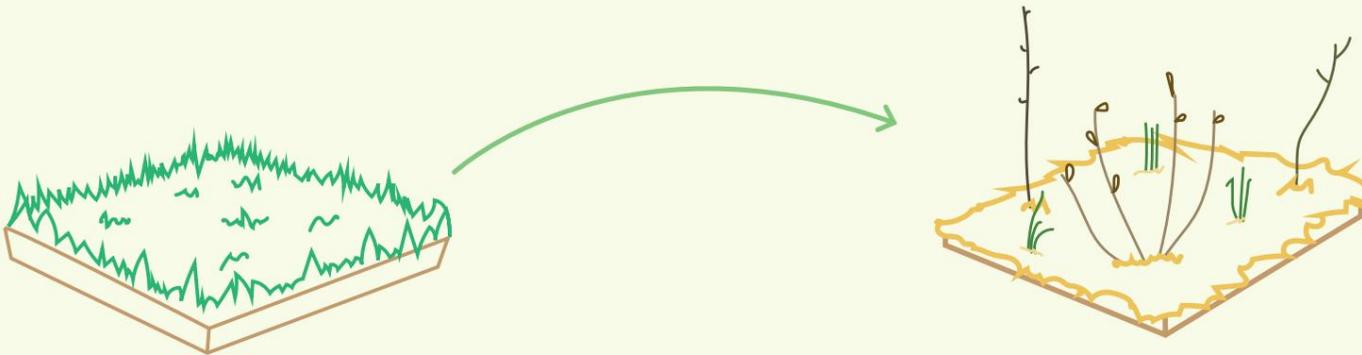


-Chapter 3-

CHOOSE SPECIES



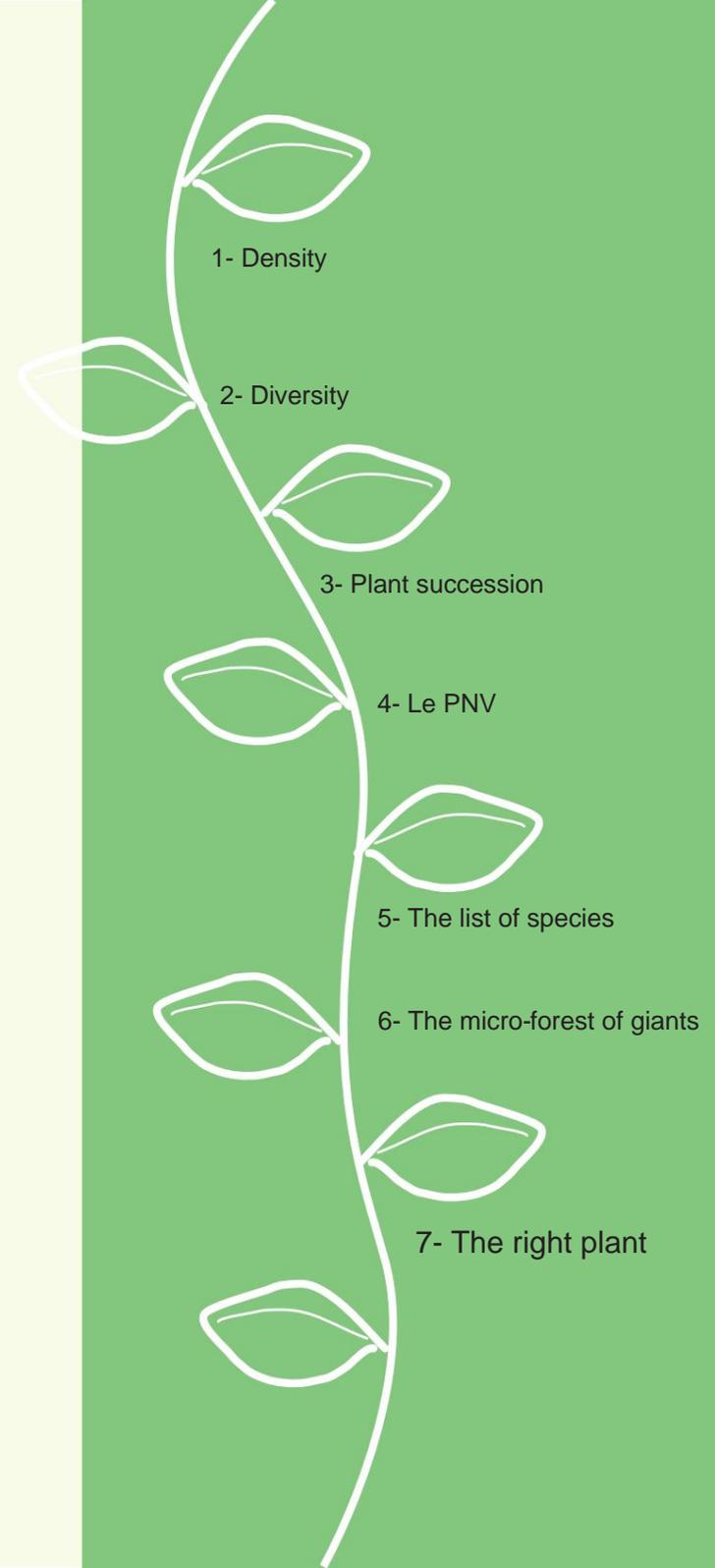
What species should I plant?

The Miyawaki Forest is a plant community that aims to recreate a forest ecosystem as it would exist naturally, without human intervention.

The choice of species is therefore central, and is based on the observation and contemplation of the species which grow around the planting area.

First of all, we will present to you the characteristics of the Miyawaki method linked to the density and diversity of the species.

Then, we will present the tools you can use to select local species, in accordance with the characteristics of your land.



1- density

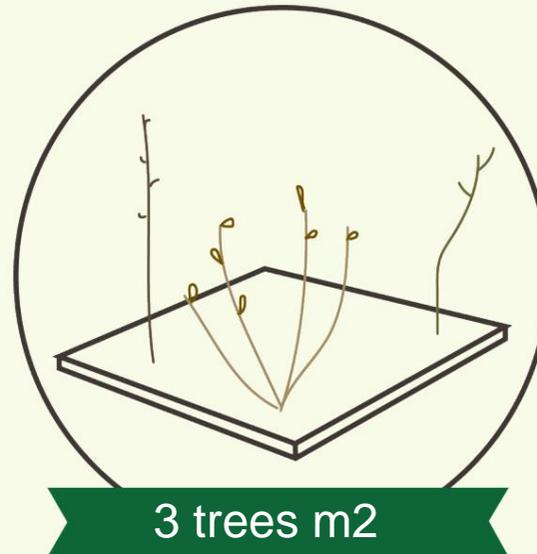
The Miyawaki method challenges all preconceived notions about the density of conventional plantations. In metropolitan France, with the Miyawaki method, three trees are generally planted per m².

IMITATE A NATURAL FOREST:

Tiered structuring of the forest -> each tree finds its place and makes the most of each light well.

CREATE A MICRO-CLIMATE:

The proximity of trees will make the forest more resilient to climatic hazards (wind, cold, frost, heatwave, etc.)



GROWTH:

Promote growth through cooperation and competition among trees.

BIODIVERSITY:

Promote biodiversity: the plant density makes the micro-forest impenetrable, protecting from human intervention and offering a great diversity of shelters for the forest's occupants.

ADVICE

"But isn't it too tight?"

Well no, forget your prejudices! The forests we are used to are managed forests, sometimes industrialized, in which the trees are very spaced out, and which in no way resemble natural forests... where the tree density is much higher!

2- diversity

Microforest plantations rely on a wide variety of species: from 15 to 30 different species. These species occupy different layers of vegetation, using every available space to grow, making the forest impenetrable after a few years.

IMITATE A NATURAL FOREST:

Recreate a living and diverse forest ecosystem with dominant, secondary and minor species.

PLANTER LOCAL:

Preserve local flora and fauna adapted to these species. These species are generally better adapted to the climate of the geographical area.



RESILIENCE:

The diversity of plant species helps to promote the resilience of the micro-forest in the face of diseases and to pests.

BIODIVERSITY:

Trees are hosts for fauna, flora and fungi. But some living organisms will prefer certain species more than others. The more different species there are, the more biodiversity is favored.

ADVICE

“What is a natural forest?”

A natural forest is characterized by: a high density of trees, a diversity of species, the occupation of different strata, anarchic growth and enhanced biodiversity.

3- plant succession

The development of a natural forest goes through different life stages, this is called plant succession. With the Miyawaki method, tree species that would be present in a mature 200-year-old forest are directly planted.

a mature forest

It all begins with a meadow... Then brambles and shrubs will serve as defenses for the establishment of pioneer trees, then secondary trees, until reaching the stage of a mature and diverse forest.

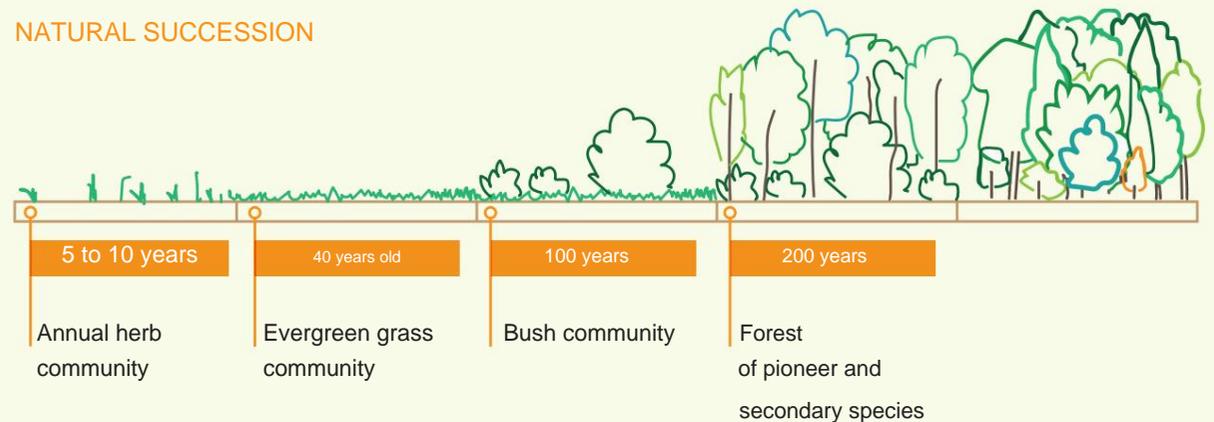
It will take 100 or even 200 years to reach this stage in a typical forest in our latitudes.

With the Miyawaki method, time is accelerated by establishing a diverse community of species from the very beginning. Interactions between all elements of the forest are encouraged, and the trees thus grow to their maximum growth potential. This results in: a very low mortality rate and

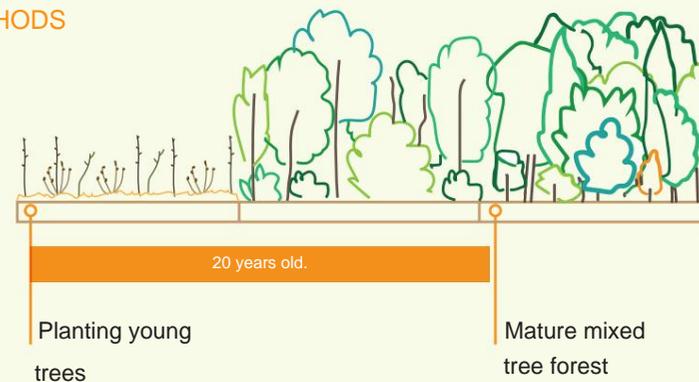
growth up to 10 times faster.

The ideal conditions are created to form these different plant layers, which makes it possible to obtain a mature forest in 20 years.

NATURAL SUCCESSION



NEW METHODS



4- the pnv (natural vegetation potential)

It corresponds to plant species that would be naturally present in a specific environment (relating to climate, soil, region) if there had been no human intervention. Present for thousands of years, these are species that have been able to adapt to changes in the environment and climate.

potential natural vegetation

- Concept developed by German botanist and phytosociologist Reinhold Tüxen
- It is used in the Miyawaki method to select species adapted to the geographical area of the plantation.
- In a natural, mature and stable forest, we observe that the distribution of species is not equitable. The Miyawaki method distinguishes 3 categories of species:
 - dominant** : they characterize the forest, often two or four species (oaks, beeches, etc.) which dominate and are found at all stages of maturity.
 - secondary** : we observe them regularly but they are not as present as the dominant ones.
 - minors** : we only encounter a few individuals in the forest.



the climate

What about climate change? Shouldn't we choose species from warmer, drier climates to anticipate their adaptation to future heat? It's a good question, but it's important to know that local flora and fauna are synchronous; by introducing exogenous species, they risk not flowering or bearing fruit at the time when local insects and birds need them! Conversely, insects and birds will not be able to play their role in pollination and plant reproduction.

4- the Haute-Garonne National Park

It corresponds to plant species that would be naturally present in a specific environment (relating to climate, soil, region) if there had been no human intervention. Present for thousands of years, these are species that have been able to adapt to changes in the environment and climate.

the pnv of the Toulouse metropolis

Map from EuroVegMap software: [\[software\]](#)

It provides a map and a database of the communities of species present in different environments, with information on their distribution (dominant, secondary or minor).

The Giants micro-forest is located in the “light green” zone (G38) while the majority of Toulouse areas are located in the “light blue” zone (U25) -> The PNV differs between these 2 zones (the collective is currently studying the “light blue” PNV)

To locate yourself on the map, you can use the waterways. Some major cities are positioned. Otherwise, it is advisable to overlay with a satellite map.



5- the list of species

Once the geographical area and terrain have been chosen, it is possible to draw up a list of species. This requires relying on the PNV but also on an observation of the surrounding vegetation.



#1

establish a theoretical list

- CNRS potential vegetation map to consult
[[HERE](#)] _____
- free application (but in English) on Windows:
EurovegMap to download [\[HERE\]](#)
-> provides more precise data on the PNV (see next slide)

	percentage of trees	number of species
Dominants	40%	2 to 4
Secondary	40%	5 to 8
Minors	20%	all the others

ADVICE

Many local associations organize initiations, training sessions, and tours. At first, you may feel disoriented, lost, and unable to distinguish between tree species. But little by little, you'll learn to recognize the black bud of an ash tree, the number of veins in a field maple leaf, or the twisted silhouette of an oak!



#2

observations terrain

- Observe the woods and wild forests around your home and located in the same area to identify the species that grow there naturally and their distribution.
- Use identification tools during your walks in the forest
 - recognition book, e.g.: Delachaux Guide to the Trees of Europe
 - application mobile, ex : plantnet
- Ask local associations or botanists for advice. Some associations, such as Arbres et Paysages d'Autan, organize botanical reconnaissance walks.

6- the micro-forest of giants

Once the PNV of our area was studied, we defined the list of species by taking into account the PNV but also the surrounding vegetation. We arrived at a list of more than 20 different species occupying 4 layers of vegetation.

List of species

- **The occupation of the different strata** : high jet, medium jet, shrubby and bushy - **The distribution of species** : Ensure that the dominant, secondary and minor species are present in the different strata.

The choice of species for the Giants micro-forest: It was carried out by **Urban Forests** in collaboration with the **Arbres et Paysages d'Autan (APA)** association . All the plants were supplied by APA and a large proportion are labeled "Local Plants". The seeds are harvested in the forest by the association's volunteers and a nurseryman then takes care of growing the plants.

DOMINANT SPECIES:

Downy oak_ <i>Quercus pubescens</i>	High jet	15%
Field maple_ <i>Acer campestre</i>	Medium jet	15%
Blood Dogwood_ <i>Cornus sanguinea</i>	Bushy	16%

45%

SECONDARY SPECIES:

Wild cherry_ <i>Prunus avium</i>	High jet	6%
Sorbus torminalis	Medium jet	6%
Blackthorn_ <i>Prunus spinosa</i>	Bushy	6%
Wood Privet_ <i>Ligustrum vulgare</i>	Bushy	6%
Viburnum lantana	Bushy	4%
Honeysuckle_ <i>Lonicera xylosteum</i>	Bushy	4%

32%

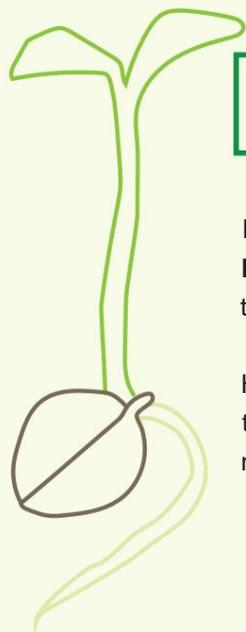
MINOR SPECIES:

English oak_ <i>Quercus robur</i>	High jet	2%
Common Ash_ <i>Fraxinus excelsior</i>	High jet	2%
Small-leaved lime_ <i>Tilia cordata</i>	Medium jet	2%
Cormier_ <i>Sorbus domestica</i>	Medium jet	1%
Elm_ <i>Ulmus minor</i>	Medium jet	1%
Wild pear tree_ <i>Pyrus cordata</i>	Shrub	2%
Wild apple tree_ <i>Malus sylvestris</i>	Shrub	2%
Montpellier Maple_ <i>Acer monspessulanum</i>	Shrub	2%
European spindle tree_ <i>Euonymus europeae</i>	Bushy	2%
Black elderberry_ <i>Sambucus nigra</i>	Bushy	2%
Eglantier_ Dog rose	Bushy	2%
Medlar_ <i>Mespilus germanica</i>	Bushy	1%
Juniper_ <i>Juniperus communis</i>	Bushy	1%

23%

7- the right plant!

Choosing your nursery is an important step. You need to make sure they can supply all the species you require, that the delivery date fits into your schedule, etc.



originally, the seed

In theory, the Miyawaki method recommends **collecting local seeds from nearby forests** and germinating them directly in the soil on the chosen plot.

However, for practical reasons (participatory dimension of the project, time saving, ease of monitoring), the use of nursery plants is recommended.



the right plant

- Find a **local nursery**, possibly labeled 'local plant'
- **Young trees** = 2 years maximum, the younger the tree, the more likely it is that the transplant will go well!
- **Bare-rooted** or **potted** plants ?
 - Potted plants have the advantage of being easier to plant in participatory projects, especially with children: there is little risk of poor root positioning.
 - Bare-rooted plants are more fragile, they must be kept moist and pralining carried out: before planting, the roots of the tree must be coated with a muddy mixture of clay and water.

ADVICE

It should be noted that it is sometimes difficult to obtain all the desired quantities of wood from a single supplier. In this case, we adapt and review the statistics on our list.

and now ?

Now you know how to make a list of species to plant.

In the next chapter, “ Soil **Preparation,**” we will introduce you to what the Miyawaki method recommends for soil cultivation.

We remain at your disposal to discuss your project.



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