THE MIYAWAKI METHOD
TO RESTORE FORESTS FROM SEEDS OF NATIVE TREES

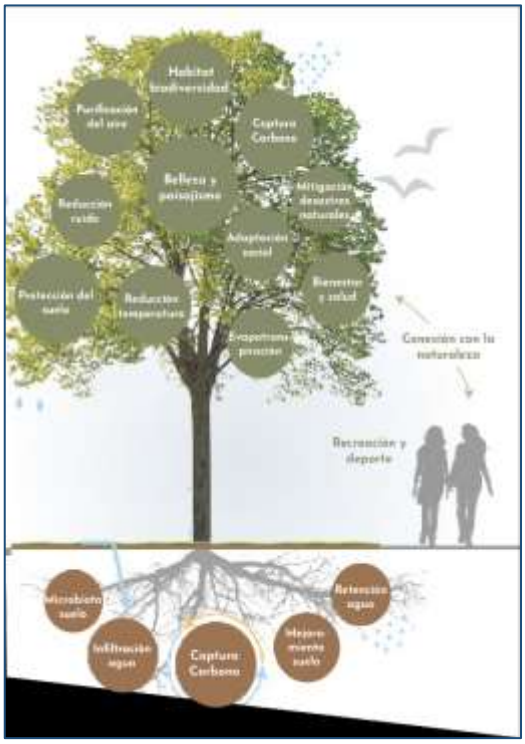
The Natural Forest built with the Miyawaki method in Chile by the ecological company Bosko is one of the projects that won the Latin American Green Awards 2023. Implemented in Parral, Maule Region of the Province of Linares in Chile by the company Bosko founded by the historian and sociologist Magdalena Valdés, is the first forest in the country that has adopted the innovative technology of the Japanese botanist Akira Miyawaki, an expert in plant ecology and specialised in seeds and natural forests.

Calculating that only 0.06% of contemporary Japanese forests once were indigenous forests ad considering that contemporary forests, created according to forestry principles are neither the most suitable candidates to address climate change nor the most resilient vegetation for the geo-bioclimatic conditions of Japan, Akira Miyawaki developed, tested, and refined a method of ecological engineering, today known as the Miyawaki method, to restore native forests from seeds of native trees on very degraded soils that were deforested and without humus. Developing this innovative approach in Japan, using the concept of potential natural vegetation, he has been active worldwide as a specialist in natural vegetation restoration of degraded land. With the results of his experiments, he has restored protective forests in various tropical countries, in particular in the Pacific region. Miyawaki has demonstrated that rapid restoration of forest cover and soil was possible by using a selection of pioneer and secondary indigenous species that were densely planted and provided with mycorrhiza. Miyawaki has instructed people on planting in more than 1,700 areas around the world, including 1,400 sites in Japan as well as in Borneo, Amazonia, and China. He was involved in planting of over 40 million native trees, together with companies and citizens, to contribute to international reforestation. Since 1978, Miyawaki had contributed to vegetation surveys in Thailand, Indonesia, and Malaysia.

His methodological work in the 1970s and 1980s on woodland management also formed the basis for the concept of "tiny forests", consisting in small urban plots of land around the world which can be densely planted with many different local species of trees to reintroduce varied wooded habitats that are rich in biodiversity.

In 2021, Magdalena Valdés took the initiative to launch the implementation of Miyawaki technology in Chile and to create the ecological company Bosko for its operation in the country. The aim of Bosko was to create native forests of accelerated growth and develop ecological restoration and regenerative landscape projects with a comprehensive ecological approach, functional and aesthetic, to promote the restitution of degraded ecosystems and transform them into refuges for biodiversity and people. The first pilot project was developed in the Miyawaki Forest Los Maitenes, in the Maule Region of the Linares Province of Chile.

The implementation of the first Miyawaki forests became a national success that generated the interest of other local communities and institutions in reproducing the experience. The Miyawaki Method to restore forests revealed to be 10 times faster, creating a forest 30 times denser and 100 times more biodiverse. On the site prepared to present the method and its results, the Bosko company reports that the results in 2023 consist of 200 Miyawaki Forest projects implemented in 15 Regions of Chile, with 5,500 native species and herbaceous shrubs planted.



Through the miyawaki.cl website the company has produced and published all the appropriate information to disseminate the method in a way that encourages other actors to adopt it by creating Miyawaki Forests in their territories.

The site currently presents the benefits that the Miyawaki Forests can bring to the territory, environmentally, socially and economically:

- They reduce the ambient temperature by up to 5°.
- They can act as an acoustic barrier that reduces around 20% of environmental noise in an urban context.
- Tree leaves absorb about 15% of toxic particles from the air in addition to function as a mechanical barrier against pollution.
- Green areas and their surroundings are associated with lower crime rates and a greater sense of security and social adaptation compared to arid areas.
- The presence of tree cover improves the value of a property and increases its capital gain.

The website summarizes the main characteristics of the Miyawaki method to encourage other actors to adopt this methodological innovation:

- *Native Species*. Part of Miyawaki's success is choosing native species, super adapted to the place where they will be planted, so that they consume less water and are more resistant than others.
- *Stratification.* It is recommended to create several strata or heights with large trees, shrubs and native plants, designing these layers by type of final height that they should reach.
- *Seedlings*. Select seedlings between 60 to 75 cm to plant, of the chosen species adapted to the location. It is recommended to use the greatest possible diversity of native plants.
- *Density per m2*. It is recommended to plant between 3 to 5 seedlings per m2. It is recommended to mark the land and plant the seedlings in a triangular shape, alternating the species.

- *Fertilisers.* A relevant aspect is the adequate fertilisation of the soil, using biomass, biochar, compost, worm castings, de-compacting the soil.
- *Tutors.* The use of stakes is recommended so that the plants grow straight and do not hinder their own growth or that of their neighbours.
- *use of mulch*. It is recommended to cover the entire plantation with coverage or mulch, such as straw, chaff, biochar in order to avoid evaporation and heat stroke.
- *2 years*. The new Miyawaki forest must be watered daily for 2 years until it is autonomous. Without pesticides, chemicals or pruning.

The Miyawaki Reforestation Method is based on native plant species that interact with each other within communities. This tree planting method is one of the most effective for rapidly create forest cover on degraded land and it has been used for other purposes, such as agriculture or construction. It is effective because it is based on the principles of natural reforestation, that is to use native trees in the area and replicating the natural regeneration processes of the forests. The same occurs when a gap opens in the upper layer of the forest due to the fall of a larger tree. Young trees grow very quickly to compete for light and then natural selection will favour the fastest growing individuals.

The set of activities to be carried out for Miyawaki reforestation are:

- Soil identification. Looking for its deficiencies and the nutrients it has.
- Identification in the database of the species that adapt to the climate and type of terrain of the place
- Search the region for the biomass necessary to make up for the land's shortcomings.
- Without using pesticides or added products. Modify the surface part of the area to feed the trees during the first two years.
- Plant the species at a very high density.
- Irrigation and weeding. Greater biodiversity has been recorded in Miyawaki forests than in neighbouring forests, making it an ideal method for quickly creating diverse forest ecosystems. Trees planted with this method grow much faster, starting the forest-building process and capturing more carbon.
- The Bosko company has also produced an instruction manual with the main 6 steps of this technique that allows you to have forests that are 30 times denser and grow 10 times faster. The following steps are based on the experiences carried out in the Miyawaki Forest and ongoing in Chile:
- Step 1: Know the structure of the soil and determine biomass
- Step 2: Select native trees for planting
- Step 3: Design the forest
- Step 4: Preparation of the area to be planted
- Step5: Plant the selected trees
- Step 6: Take care of the forest for two years

The ecological company Bosko is planning to implement a Foundation that will allow to intensify promotional activities for the

Miyawaki method in Chile, responding to the requests from all communities and local institutions interested in reproducing the method in all their territories.

To know more

Bosko website

Miyawaki.cl website

Bosques Miyawaki

Akira Miyawaki in Wikipedia

Articulo Municipalidad de Curicó

Premio Latinamerica Verde 2023

Temas del Blog de Miyawaki

Akira Miyawaky in Bosques Miyawaki website

Article in Plantarum.es

Article in litoralpress.cl

Article in baserepublica.cl

Article in opia.fia.cl