

# Syntropic Farming

## Quick Guide Version 1.3

Author(s): Uzzy Arzmann

Date: 12. Apr. 2023



## Planting trees versus planting forests

Trees planted next to each other not automatically become a forest. They do not even connect or interact with each other in many cases. Trees of a certain age do not harmonize with species of other ages when all planted the same time. They also lack the shading and feeding “mothertrees” above them. Trees have specific needs for light or shade, so many die off quickly in a tree planting due to the exposure to the full sun.

When trees grow naturally in a forest, they follow a certain timeline and have a specific lifecycle. If not all life cycles are represented, the system gets stuck in evolution and becomes weak and vulnerable.

Especially tree monocultures do more harm than good, as they change the microclimate and are prone to fires and pests. On the social side, encouraging tree planting, especially in third world countries, potentially takes away arable land for food production and threatens local livelihoods.

A forest on the contrary is a living being, a functioning ecosystem with countless actors above and below soil. A forest is a dynamic, evolving, resilient and interconnected system of high complexity. It starts on bare ground where the first colonizers prepare the soil for the following species and they again work to create the living conditions of more demanding species.



A forest is grown using nature's powerful process of natural succession which constantly increases the quantity and quality of consolidated life. It seamlessly integrates the lifecycle of each species, its needs for nutrients, light or shade.

Each actor in the system fulfills a specific function to benefit the system as a whole. As the system evolves, it increases its biodiversity in visible species and hidden in its genetic code for the future forests evolving after a disturbance. The quality and quantity of soil is growing and with it the fertility of the place. It is grown resilience.

Forests are the wombs of springs; they host and clean our drinking water. Furthermore, forests are climate active in the way they shape the water cycle above and below ground. And yes, they sequester carbon as well. As without water, carbon will not be stored sufficiently.

## Forest planting versus Syntropic Farming

And here is where Syntropic Farming comes into the picture. With this land use method, forests are grown as productive agro-ecosystems, following nature's dynamics while providing food, medicinals, timber, fibers and ecosystem services such as carbon sequestration, clean water, clean air etc.

Did you know that we could replace all fossil fuel-based materials and grow alternative raw materials in Syntropic Farming?

Thanks to the planting along nature's successional timeline, high density of species allows it to grow more on less land while needing less to zero irrigation.

## Why integrate trees in agriculture?

In Syntropic Farming, we work with crop trees, noble timber and servicetrees, usually wild species that are added due to different, valuable functions they fulfill.

They also are a bridge to the natural ecosystems. Some of them are fast-growing and provide shade to the upcoming saplings of slower species. They are great sources of biomass which is added as "food" to the system. A regular pruning of servicetrees, stimulates growth in the whole planting.

Their soil building ability is important as they partner with huge networks of fungi and bacteria that improve the soil structure, -quality and water-holding capacity.

They reach deeper soil areas and are bringing vital minerals to the surface. Due to their photosynthetic capacity, they are major contributors to the liquid carbon pathway into soils.



Trees change the microclimate of a field. They break wind patterns and release water into the air due to their photosynthetic process.

Wind is a major factor in humidity- and topsoil loss, especially over bare ground. Science also discovered the ability of trees to create their own rain using bioprecipitation.

Some species act like water pumps bringing more humidity to the surface. As we plant trees in high density, we create a future forest ecosystem that improves the local water cycle.

When developing large areas with Syntropic Farming from shoreline going inland, we are even able to rejuvenate the biotic pump, a conveyor belt of humidity in the lower air layers, which brings fertility and humidity to the centers of continents.

Trees also increase the economic value of a field in the longer run, next to crop species especially noble timbers are of interest.

There are numerous species, which combine crops and timber. Trees also minimize migration – farmers do not leave their timber; it is an economic value planted on the field.

## What is Syntropic Farming?

Since more than 40 years, a Swiss researcher and farmer by the name of *Ernst Götsch* has developed a nature-imitating farming technique he calls "*Syntropic Farming*".

In 1944 the Italian mathematician Luigi Fantappiè defined the term "Syntropy" to describe the ability of living systems to align towards a better, more resilient organizational setup in the future. A setup where life is conducive to life. Where life creates conditions for more life to thrive. Where the quantity and quality of life grows over time.

In comparison to its complementary force - Entropy - that describes the diffusion of energy - Syntropy concentrates energy. It organizes itself in higher and higher complexity thereby reducing energy diffusion.

Syntropy is - one could say - the driving motive and engine behind biodiversity. Ensuring thriving and abundance while creating living systems that are robust and adaptable to disturbances and change.

This can be well observed when disturbances in a landscape happen – the process of regeneration starts immediately, the "wound" is closed and the system develops into a complex macro-organism in the form of a forest.

If mankind would not be on this planet, all suitable pieces of land would be forest. So, Syntropic Farming uses this powerful life process to create productive

macro-organisms that are – as their natural role model - independent from external inputs.

It does not need:

- External fertilizers
- Fungicides
- Pesticides
- Herbicides
- Irrigation

As studies show – this technique changes the microclimate and is able to “*grow its own water*” – or as Ernst Götsch calls it: “*Water has to be planted*”.

On his own farm he regenerated long dried-up wells, changed the soil quality dramatically and “recycles” 180 – 200 tons of organic matter per hectare per year.

Some studies show a productivity of 80 tons of crop/hectare/year – no conventional farming is able to reach such a high productivity in yields. Yet yield is a concept that might need changing – as pure volume does not express quality. Nutrition per hectare is way higher with this method.

Syntropic Farming works with heavy, yet specific mulching to keep ground temperatures cool. It is – compared to conventional farming – four dimensional. The agro-ecosystems are created in length, width, height (strata/layer) and along the timeline.

It means that a farmer can start to harvest first species as early as three weeks after a system has been set up and then has constant yield as time goes by.

It is complex in design and the initial setup needs manpower – yet the benefits of the system outweigh this tenfold.

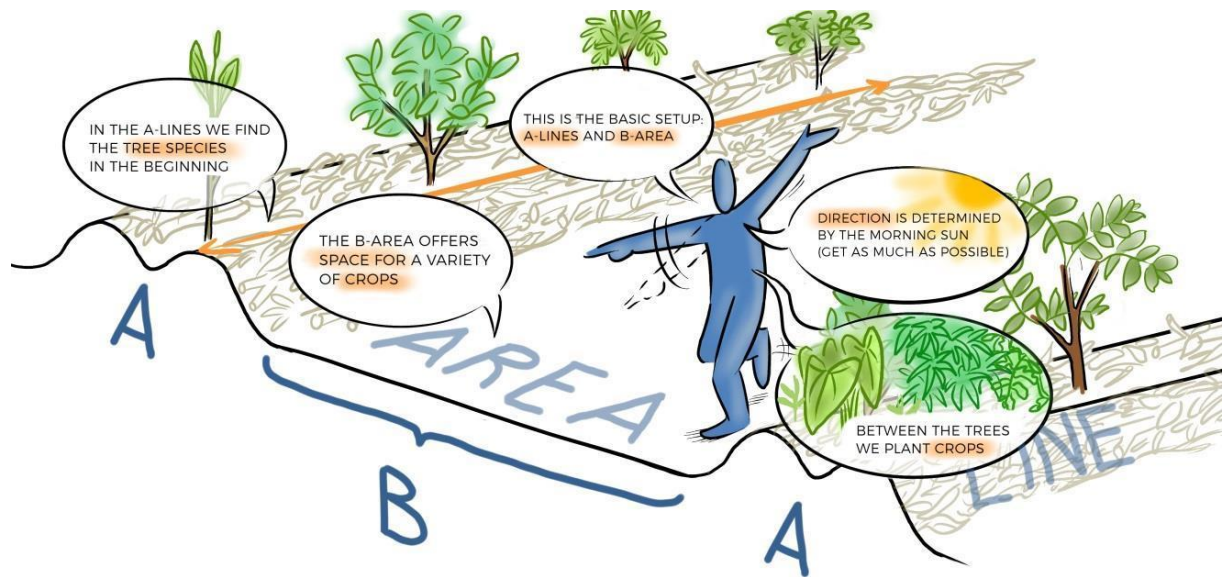
Syntropic Farming techniques work from small to real large scale and in all climate zones and soil conditions.



*A new system is established – to the right you already see more matured lines Casimiro de Abreu, Brazil, Syntropic Farming teaching facility, 2016*



*System of two years, same place, now crops have shifted from veggies to fruits and first timber was harvested. Casimiro de Abreu, Brazil, Syntropic Farming teaching facility, end of 2017*



The farms grow their own fertilizer by using fast growing, well adapted trees in the so-called A-Lines, together with crop species. They are pruned regularly to feed the system with organic matter and to give it growth impulses. Grasses are well wanted agents in Syntropic Farming as they are a growing machine for mycorrhizal fungi and great and easy to manage biomass. In order to weave it into existing, local forests, the planting of native species amongst the crop trees is a common practice.



*The B-Area in this later stage becomes the place for coffee which will be shaded by the A-Line trees. Sitio Raiz, Brazil*





*3 year old system on sandy soils of 1,5ha with pear, plums, nuts, poplar, birches, vitamin roses, goji and more - Mai 2022, Berlin, Brandenburg*



*A system in the southern Mediterranean, integration into existing almond and olive systems. Only 150mm of precipitation per year. La Loma Viva, Spain.*