

A comparison between Syntropic Farming and Bio-dynamic Agriculture

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Within this document the attempt is made to give a compact and structured explanation of the differences that exist between Bio-dynamic (founder Rudolf Steiner) and Syntropic Agriculture (founder Ernst Götsch). The following content will be structured into bulleted points, to each of which a subject is dedicated. A note of thank you is directed at Ernst Götsch and Axel Rungweber who inspired and helped me to write this document.

1. Both types of Agriculture depart from the perspective of the farmer that his farm should/does function as a Macro-Organism. For a part, this means the farm should be able to function from itself and generate all necessary resources to maintain all operations without having to source external inputs (in modern Bio-dynamic Agriculture farmers that are specialized on certain crops are allowed to buy and trade resources with/from other/neighboring Bio-dynamic farms). In Syntropic Farming though, it is not just the farm as a whole, to which such qualities are attributed, but also the plantations that make it up. These plantations always consist of complex polycultures (plantations which consist of different species), in which each species is introduced to fulfill a-, a series of-, predefined function(s) in the creation and development of this Macro-Organism.
2. In Bio-dynamic farming the use of certain plant protection products is allowed and commonly practiced (for example copper to treat/prevent the occurrence of fungal infections). Manure, Rockdust, and other fertilizers are accepted and are regularly applied to maintain the capacity for production of the soil. On the contrary, Syntropic Farming abstains from the use of these products, and the application of externally sourced inputs, and relies itself solely upon '**knowledge**'. Knowledge on the sociology of plants, that is to say, knowledge of the symbiotic relationships that exist between plants, how to plant different species together on a close space, and what the conditions are-, the context to other plants/species is-, that any crop needs in order to feel well. Just as important, if not more so, is the knowledge on how to employ plants to trigger natural processes, which are responsible for mobilizing, fixing, and transforming (Micro-)Nutrients, and how to interact with these plants, and the planation they form, to catalyze and favor said natural processes. Instead of fertilizing with manure or compost, 'fertilization' in Syntropic Farming is solely based on mimicking and employing nature's own processes, which are triggered through plants that are adapted to the conditions of the sight and their associated Micro-Organisms.

*The ultimate goal of Syntropic Agriculture is: act to optimize ecological processes, therewith catalyze the regeneration of ecosystems, the long-term enhancement of the vitality and productivity of our plantations, and constantly achieving a **positive energetic balance** in the production of the aliments, and other raw materials, that are produced in agriculture. It is a form of agriculture that, instead of focusing on the exploitation of the system, looks to enhance the amount and quality of natural resources that form the eco-system.*



Cacao plantation managed according to the principles of Syntropic farming (Farmer: Ernst Götsch)

3. In Bio-dynamic Farming 'weeds' are removed with hoes and other implements which results in the soil being left 'nude', uncovered, and unprotected. Now being exposed to the influence of sunlight, photosensitive soil micro-organisms, namely mycorrhizae (beneficial/symbiotic fungi), die off. Additionally, the water holding capacity is reduced and organic material oxidizes (CO_2 is released). In Syntropic farming it is unimaginable to leave the soil unprotected. All is done to produce sufficient organic material, which is a byproduct of the management of the plants that are introduced to the plantation for their transformative capacities, to cover and protect the soil generously. Weeds as such exist only sparsely within Syntropic Agriculture. Every plant is studied as being part of an entire system, a Macro-Organism, to understand what its Eco-physiological functions are, how it could positively affect our crops, and in most cases 'adopted'. Many unpopular plants such as thistles, mallows, and brambles are even intentionally introduced into plantations, again for their transformative capacity and ability to trigger and direct natural processes.

4. Many Bio-dynamic farmers are taking steps to diversify their crop stands. Different species are intercropped based on the knowledge of which plants are compatible with each other. However, this practice finds a new peak within Syntropic Farming. Different vegetable crops are planted in appropriate spacing and context with each other and together with many different herbs-, 'weeds'-, as well as all with an extremely high density of trees. The goal is here not just diversification of crops, but also the continuous development and progress of the plantation, which will, from itself, produce an ever-increasing richness of resources, and continuously grow to be an ever more complex system/Macro-Organism. High quality timbers become an abundant by product of plantations managed in this fashion. Furthermore, is it the goal to increase the amount of photosynthesis, in terms of spacial coverage and potency, occurring on the site. Food production to support the re-creation of healthy and exuberant ecosystems. Humans acting as a **useful and desirable** part of the Macro-Organism Planet Earth.



A corn field planted in the forests of Ernst Götsch. Every corn plant is acting as the nursery for the young trees seeded underneath (Farmer: Ernst Götsch)

5. Crop rotations make up an important part of the practices of Bio-dynamic farmers, with strict regulations in place determining every how many years a culture is allowed to be cultivated on the same field. In the meantime, the natural succession of species is the principle that Syntropic farmers make use off. If one is to plough the soil after harvest, or remove the established vegetation in some other manner, in order to introduce the following crop in the crop rotation, the ecosystem experiences a set back to the zero point (in terms of progress in the natural succession of species). When departing from this zero-point, a Syntropic farmer introduces a series of cultures, all at the same moment, which will succeed each other in time, and complement each other within space; that is to say the plantation - into which vegetables of annual lifecycle are introduced together with plants of biennial life cycles, trees of short lived forests, and their associates (f.e. brambles), as well as trees belonging to forests of medium- and long life lifecycles - continues to evolve and becomes an ever increasingly complex, and rich in resources, eco-system. It is always the goal that the quantity of established life, as well as the quality of life conditions for all consolidated individuals, increases/improves. Syntropic farmers work with natural succession, the ecosystem as a whole, instead of crop rotations and/or consortia.
 - a. It is here typically the practice to plant trees directly by seed, in extremely high density, in order to imitate the natural regeneration of a forest (for every tree that is to be established a minimum of 100 are usually seeded). In the first test field (~5000m²) on my farm in Portugal, are roughly 15,000 young trees which are currently growing, and will actively form, or contribute to the creation, of the forest that is to be there in the future. For every bed there are around 80 different species growing together (including vegetables and trees of different lifecycles). Having planted so densely allows the establishing trees to co-define who is the most well suited for that specific location, a processes in which the farmer will then involve himself by selecting the strongest, healthiest, and most vigorous trees. Through this practice, the velocity in which the ecosystem regenerates is highly increased.
6. In the theory of Syntropic farming, inter- and intraspecific competition does not exist. Plants are introduced, cultivated, and managed under the idea that they all contribute to each other's well-being. Instead of accusing them of stealing and fighting for water, nutrients and light, the Syntropic farmer interacts with all plants based on the perception that all inter- and intraspecific relationships base on cooperation (that is to say, individuals belonging to the same species, as well as individuals from different species, help each other mobilize, retain, and optimize the quantities in which each of these basic resources becomes available).

7. To follow up on the previous point; In order to maintain harmonious relationships between all plants, and fortify the dynamics of the agro-ecosystem, the Syntropic farmer practices a type of management service that is quite unique to this form of agriculture. The only goal of these management services is the optimization/catalyzation of life processes (not as some believe and practice disponibilization of organic material). During this management, which mostly consists of a technically correctly executed pruning of trees, shrubs, and herbs, the subjected plants are brought into harmony with themselves (maintenance of a balanced crown shape), and to all their neighbors (each plant is maintained within the appropriate spacial/shade context to the co-established plants). Result of this management is the strong rejuvenation of the vegetation, increased growth/photosynthesis rate, and resultingly a drastic change in the activities of microbial life on the site, which are now working to bring 'locked-up' nutrients into plant available form at accelerated velocity. This work is what maintains and fortifies the natural dynamics of the ecosystem, and employs them to bring forth healthy, vigorous, and productive crops.
- a. Also this is not an invention of the practitioners of this form of agriculture, but is the attempt to mimic that which is observed to happen when natural forests are subjected to strong winds, rains, and/or flood waters, but also from the relationship which fruit and leaf eating animals have to the plants which are endowed to their service.



In the foreground, a freshly pruned cacao plantation (Farmer: Ernst Götsch)

8. Bio-dynamic farmers make use of a number of preparations, which act in a homeopathic fashion, to transmit in-formation to their plants. These in-formation agents act to give the plant impulses which lead to increased flower and fruit production, stronger root systems, or improved immune systems in plants. The large array of preparations which are prepared and applied according to the lunar calendar form one of the main strategies for Bio-dynamic farmers to increase crop vigor and productivity. This, however, is just a type of short cut to achieve that, which nature achieves through intra- and interspecific relationships [relationships within individuals of the same species as well as individuals of other species], which exist within communities of plants, and fortify through the dynamics of the ecosystem. In Syntropic farming it is the attempt to employ the processes, relationships, and dynamics, mentioned in the previous sentence, in a manner which leads to the increased health vigor and productivity of the plantation through itself (without the need of applying externally sourced inputs or in-formation carriers).
9. The previously mentioned preparations are also made use of, in Bio-dynamic farming, to give 'pests' and 'diseases' the information that 'here they currently have no function to fulfill'. Whoever practices Syntropic farming, however, acts from the standpoint that that, which is conventionally considered as 'pests' and 'diseases', is part of a system which acts to **optimize life processes**. What I am trying to say is that these agents only become active when a certain plant/crop is not planted/managed within the correct context. The approach of Syntropic farming is therefor to give each plant the correct conditions which it needs, in terms of shade/light filtration, context to other plants, optimization and maintenance of its own crown shape, within a complex and dynamic agro-ecosystem, which has the result that, when correctly executed, 'pests' and 'diseases' do not make an appearance within these plantation, and for the case that they do make an appearance, they give us indications which make our own misconduct obvious, and can teach us lessons about how we can improve our behavior.



Photograph of a Syntropic Cacao farm (Farmer: Ernst Götsch)

Bio-dynamic farming proves itself as one of the most consequent forms of Organic Agriculture. Syntropic farming is the most consequent form of regenerative agriculture.

To live up to the consequences which are arising due to the climate crisis, we, as humanity, should begin to think about, how we can transform the areas which we have robbed of their diversity, richness, and natural capacity for productivity, but most importantly **capacity to cycle water**, back into functional ecosystems, that allow us to procure the raw materials we need to sustain our economy and health. Whoever hopes that the conservation, of the few, and ever shrinking, areas of intact forests we still have will bring forth our salvation, has to be disappointed, for it will only be the creation of 'areas of permanent inclusion' where humans live as a beneficial part of the ecosystem and our home, the living planet, that gives us an outlook for a fertile future. Syntropic farming offers a number of holistically viewed solutions to this topic, which have the potential to put us into the position of becoming a beneficial part of vivid eco-systems, increase agricultural productivity in a natural and long term manner, and will, when put into practice, open us the doors to the paradise on earth again.



Sunrise over the forests planted by Ernst Götsch