Regenerating the land, the mindset and the people through syntropic agroforestry

By Roland van Reenen, Syntropic Agroforestry and Permaculture teacher and consultant

Roland van Reenen with blue shirt, next to the former minister of agriculture Suzy Carmelia Romer of Curaçao on one of our syntropic farms (Daniel Parris)

Roland van Reenen
Forest farmer

PAC
PROTOCOL

YouTube: Roland van Reenen Forest Farmer

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Roland van Reenen is an experienced syntropic agroforestry practitioner, student, teacher and consultant. After witnessing the astonishing results of the first syntropic agroforestry farm in the hot and dry island of Curaçao he became a very enthusiastic ambassador of its infinite wisdom. Although he taught about 1000 people in Aruba, Curaçao, Bonaire, Kenya, Uganda, Tanzania and Zambia he consider himself most and for all a student of this always inspiring and practical knowledge. Roland is also a Permaculture Designer and did his PDC with Geoff Lawton. Besides that he has been trained in Regenerative Organic Agriculture facilitated by the Maharishi University Iowa in Curaçao

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Roland van Reenen
Forest farmer

Syntropic agroforestry is a agricultural technology that is gaining a lot of popularity all over the globe. It started with a gentleman in Brazil that changed a desertificated and eroded place where the rain didnt fall anymore into a lush tropical food producing rainforest where streams are flowing now. In nothing you can now remember the desert it used to be.

Ernst Gotsch is the name of this gentleman produces one of the most wanted cocoa varieties on that farm. But that is maybe the least of his achievements for he changed the way that people and farmers in particular perceived the world. Through syntropic agroforestry we can regenerate any desolate place and turn it into an oasis while producing the highest quantity of food per m2. It means that the gap between agriculture and ecology has finally been bridged, that the animosity between ecology and economy has come to an end. It changes the role of people as destroyers of the landscape in that of managers of it. It is also the end of a paradigm of poverty, scarcity, impossibilities and harsh competition that has been replaced by that of abundance and cooperation.

Syntropic agroforestry is all about creating efficient food producing forests and more specified about speeding up the formation of forests that produces food abundantly. In desertified places it may take hundreds of years for a forest to grow but with syntropic agroforestry we can build up forests in 3 years. A more or less selfsustaining ecosystem that produces a succession of harvests between a month and 20 to 30 years.

To understand Syntropic agroforestry let us look into the semantics of it:

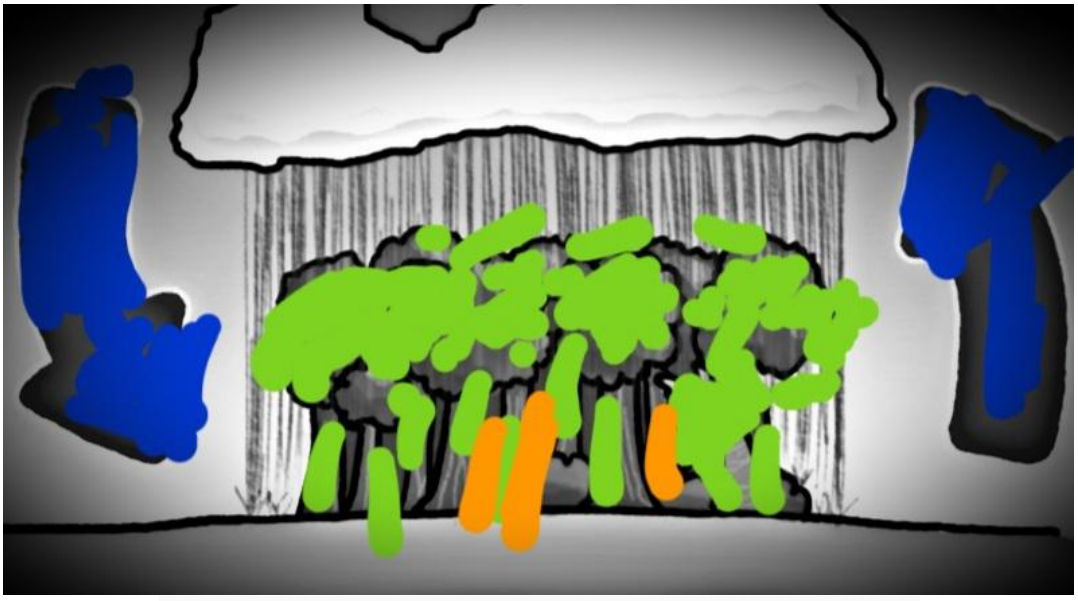
Agro-forestry is made up of two words; agriculture and forestry, it can be translated into a form of agriculture that includes the uses of trees, with the result of reforestating the farm through farming.

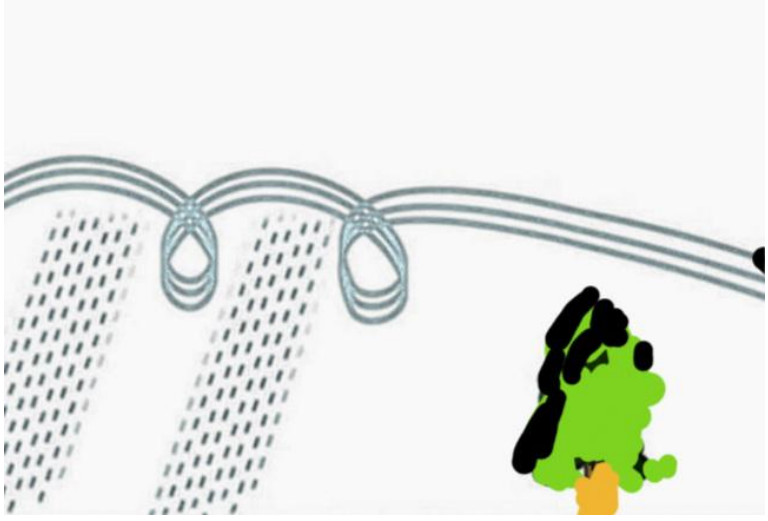
Syntropic is derived from syntropy which is the opposite of entropy. A syntropic agroforestry farm is working from entropy to syntropy, from simple to complex, from scarcity to diversity, from scarcity to abundance; abundance in energy, life, growth, food and harvests, nutrients, humidity, micro-bacterial and fungi-life, of plants and trees.

Restoration of watercycles due to the use of trees: In dryland agriculture trees are irreplaceable

Functions of trees are:
- they provide shade
- they function as a windbreak to prevent evaporation
- they keep the soil moist
- they function as a deep wells pumping the water from deep groundwaterlayers to the surface of the soil. They will irrigate that water to absorp nutrients in the toplayer
- they prevent erosion
- they are cooling the atmosphere due to photosynthesis processes
- cooling down of the temperature makes condensation and thus precipitation possible, keeping water longer in the cycle
- they will add nutrients like nitrogen to the soil through their rootsystem and as a chop and drop mulch (green manure)
- they harvest rainwater through pollens and bacteria colonies in the canopy. When those particles come in contact with clouds condensation and thus rainfall is the result

Trees are responsible for 75 % of all rainfall
Reforestation guarantees 85% more preciptation in the form of condensation
Key figures that we cannot ignore
WITH AGROFORESTRY WE CAN MAKE MONEY IMMEDIATELY WITH REFORESTATION !!!





Succession

Through the process of succession, plant life moves towards species that are capable of capturing and handling more and more energy

According the philosophy of syntropic agroforestry, nature always strives to syntropy. Succession is the tendency to develope from simple to complex, to the so called stage of abundance. A simple example would be that nature (in the tropics) strives to evolve from deserts into tropical rainforests. Through the process of succession, plant life moves towards species that are capable of capturing and handling more and more energy. This results in energy accumulation, which is exactly what the term “syntropy” means. A tropical rainforest is a typical example of an ecosystem where the stage of abundance is reached. It may take a few hundreds of years but without human interference nature will reach that goal in diferent phases. Each phase prepares the land for the species that come after.

In the placenta stage plants that are able to grow under harsh conditions and poor soil conditions are growing there. You can think of mosses, grasses, cactus, thorny shrubs or trees, but also fast growing plants, weeds or trees that are wrongly dubbed as invasive. In syntropic agroforestry we don’t

consider them as invasive because they perform a very essential role in the betterment of the conditions for the species that will succeed them. The name placenta suggests the nurturing capacity for other more vulnerable species that might be around already but that will dominate the next stages.

Samburu County Kenya, a pioneering shrub trying its best to accumulate more energy

In the next stage, the secondary stage, larger trees, with larger leaves will grow and those have a longer lifespan. They require better soil conditions.

In the last stage or climax the trees and plants live much longer. But a lot of pioneering trees and plants will disappear so the diversity could be a little less, yet the conditions are optimal for the trees of this stage

The 3 phases of evolution

The climax however is not the end according Ernst Gotsch. The trees might age and the development stops. We call this process senescence. In order to start a new cycle of growth nature offers this often with some form of destruction, like hurricanes, storms, earthquakes, fire, floodings, animals or lightning strikes. The trees that are uprooted of just fell down are drastically increasing fertility. (In order to imitate this process we lay down woodlogs in the paths between our beds) It is like a whole new potental forest was waiting for this opportunity to rise. After this destruction a new cyclus may start but now the placenta is much more fertile than the initial placenta stage. Different plants will occupy those phases because of increased fertility.

This process of renewal can only take place if the ecosystem was already in its secondary stage. A destroyed placenta needs to start again from scratch.

It takes a lot of beneficial disturbances for nature to cycle natural succession to reach a more or less final stage. These cycles can repeat themselves over a period of thousands of years. The placenta, secondary stage and climax are just smaller parts of 3 mayor stages in ths succession: colonizer or pioneering stage, the stage of accumulation and the stage of abundace.In the colonizer stage nature is doing its utmost to accumulate energy, to create life and fertility in places that seem dead. These heroic species are preparing the land for more demanding species that will succeed them. They are increasing organic material in the soil, adding nitrogen and other nutrients and increase carbon.

In the next stage more energy is accumulated, hence the name accumulation phase, More and more fertility is generated and other plants with lesser defence systems and bigger leaves can grow there. This system is still vulnerable.

After passsing through several cycles enough energy has been accumulated through increasing photosynthesis, continuous dropping of organic material and sequastration of carbon. It reaches the stage of abundance, a multi diverse self sustaining stage where most of our vegetable crops loves to grow without pests and diseases. Weeds and pioneering invasive species disappear. This is the stage of abundance. It is the stage where lifestock can exist without depleting the natural system. It is the stage where thanks to the enormous amounts of organic material large amounts of phosphorus are released.

The art of syntropic agroforestry is to get in the stage of abundance as quick as possible. For it is in this stage of abundance that your crops grow the best without pests and diseases, for it is the stage in which there is an abundance of water, nutrients and microbacterial life. It is the microclimate in which vegetables love to grow naturally because their leafstructure resembles that of leaves of plants that grow in the tropical rainforest. (in any other stage your vegetable crops are rather dying if not kept alive with a lot of irrigation and fertilizers)

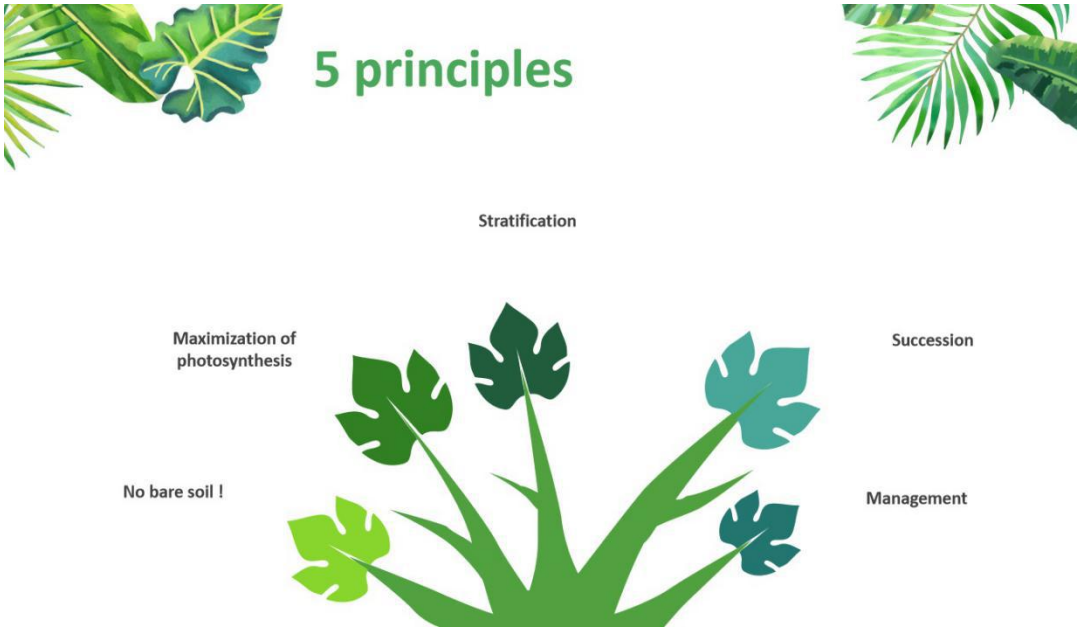
A syntropic agroforestry farmer boost this succession through the cycles with heavy pruning (which resembles the natural distruction which causes new cycles to start) and management. Also the heavy mulching from the start feeds the microbacterial and fungi web in the soil with large amounts of carbon. Its an exaggerated mimicking of natural processes which accelarates the growth cycles so mankind can move much faster to regenerate landscapes and reach the stage of abundance in a few years in stead of hundreds or thousands of years (sic!)

In order to understand the effect ofpruning it is good to realize that in an ecosystem everything influences everything. Old plants give slowing impulses to the rest of the system. Plants that are growing fast influence other plants to do so too. We saw already that aging slows the entire system, if trees are in a state of sencence it has a negative influence on all other species. In nature this problem is solved by destruction that ignites new growth cycles. As syntropic agroforestry farmers we imitate this destruction with drastic pruning. This drastic pruning boosts the whole system. Pruned plants produce a growth hormone, gibberelic acid, that will be transported through the mycelium network to all other plants. In a syntropic design we chose certain species to accelerate the growth of the whole farm when they got pruned. For instance the African savannah grasses. They are never allowed to grow seeds but pruned every few weeks. When they grow seeds their growth slows down and in order to prevent the seeds from getting spoiled they send out strong impulses or requests in the system for droughts. Is it a coincidence that in a lot of regions on earth the rainy season stops when the grass starts seeding and turns yellow?

We don’t want this slowing, aging and drying efffect of plants that will produce seeds but to the contrary need the growth impulse of young pruned grass. Those grasses can be pruned every 3 weeks and thus every 3 weeks the whole system receives a growth impulse moving in a faster pace to the stage of abundance. So pruning is like taking the foot of the brake pedal and placing your foot on the gaspedal. Biomass trees are also pruned several times a year to create a growth impulse for our target trees, the fruit trees.

If we observe a life cycle of a plant we will get confirmation about the above mentioned events. Plants grow rapid before they start flowering. When they start flowering in order to produce seeds (in fruits) the growth slows down, it gets dryer, influencing the rest of the ecossytem. So it might be clear that only fruittrees are allowed to grow fruits (seeds) but should be pruned shortly after being harvested.

Banana trees are also a vital part of the system for reasons of pruning. Besides the accelaration of growth, the pruning will add alot of mulch or greem manure to the system.Note: it is the task of the farmer to spot signs of aging and decay and must take out anything that applies to it



The technology of syntropic agroforestry is based upon 5 main principles:

- **keep the soil always covered** (with thick layers of organic material like leaves, straw, hay, woodchips or anything that once has lived and with densely planted crops
Functions of mulch are:
- The heavy use of organic material as wood, branches, leaves, dry grass, sea weeds to cover the soil, add more organic matter that will increase the possibility of water rentention in the soil with at least 4 times the normal amount
- protect the soil from evaporation and drying out
- Keep the oil longer moist after rainfall or irrigation (sometimes 12 times longer)
- Cools the earth down, so that water can be easily taken in
- prevents flooding of water
- prevents erosion
- attracts beneficial microorganisms and earthworms that feed the crops and break down nutrients from organic matter
- will eventually turn into black nutrient rich and soft soil that soaks up water

- **maximization of photosynthesis.** Photosynthesis is the process in which the mayor source of energy, sunlight is transformed into life itself, sugars, oxygen and a cooling down effect. The more photosynthesis the more energy , the more life, the more harvests, in other words syntropy instead of entropy. The science of knowing the optimal dosis of sunlight for trees and crops to achieve the best photosynthesis processes is the basis for the maximization of it. Some fruittrees need 100 % of sunlight like the coconut, some need 80 % like the mango, others need 60% like f.i. soursop and again other smight need 40 % sunlight like citrus and some just need 20 % like cocoa or coffee. The same principle for vegetables. This means that as long as crops or trees have different needs of sunlight they can be planted very close to each other without the need for competition. So the coconuttree shades partly the mango that partly shades the soursop that partly shades the citrus that partly shade the coffee. This guarantees high diversified yields per m2.

Let us focus a bit more on the cooling down effect of photosynthesis. We all know that global warming is caused by too much carbondioxide / CO2 in the atmosphere, largely caused by industrialization, traffic and industrial agriculture (large area's of bare land). In the process of photosynthesis this carbon is transformed into energy in the form of sugars, and thus causing global cooling, which is good for our planet in general but also for our syntropic farm. The densely planted canopies of our crops cause a cooling down factor which has a very positive effect on the humidity of

our farm. The cool surface of the leaves let evaporated water vapor condensate and form drops of water that will fall down as secondary form of precipitation. So we literally plant water this way.

- **stratafication**, the described technology to achieve this maximization of photosynthesis is called stratafication.

Stratafication has a lot to do with our choices in planting crops and trees. Because of the love of shade we can plant a lot of lowstrata crops. At last 80 % of bed we can use for lowstrata crops or trees. In a bed of 10 meter we can plant about 8 low strata trees and in a bed of 1 meter we can plant at least 8 vegetable crops. Medium is good for 60 % occupation (6 crops per m2), high for 40 % (4 crops per m2) and emergent 20 % of the space (2 crops per m2)

- **succession**. Succession is the knowledge that in the formation of forests one plantvariety is succeeded by the other. We imitate this in our production of crops, f.i. radishes after 3, 4 weeks, succeeded by cucumbers after 5 , 6 weeks, succeeded by melons in 6 or 7 weeks, succeeded by okra and corn after 8 weeks, succeeded by eggplants that keep on producing till the cassave gets ready. The cassave will be succeeded by papaya and bananas, unit they will be succeeded by the fruittrees that will be succeed by timberwood. And this whole line of succession is planted in one and the same time so there is no need to waste energy in ploughing and waiting for crops to be ready. With the same amount of water as for a single crop.
- **management**; this is the work of the farmer, to speed up processes by pruning to pump up the system with biomass, to keep the stratas in place and to harvest.

Basic design:

At least 5 beds of 70 cm with paths in between of 30 cm in the direction North -South. In this way all plants receive the neccessary sunlight according their demands. The low stratas will only receive sunlight in the morning from the east and the evening sun in the west. This direction is only beneficial when the farmer sticks to the stratafication.
The first bed is a treeline with a successive vegetables placenta
The next bed is a biomass bed filled with mombasa or napier grass
The bed in the middle is a vegetable bed
The next bed is a biomass bed again with grasses
The fifth bed is a treeline again with a succession of vegetables as placenta


Syntropic Agroforestry farm of Klarvin Cijntje in Curacao







The paths should be filled with woodlogs. They function as watertanks that soak up water during rainfall and store it there for dryer times. They will also attract mychorrizhal fungi that will function as the internet of the underword and manage the system (self sustaining forests)
Besides that the logs imitate the climaxphase of an ecosystem that got disturbed by a natural disaster to start a new more fertile cycle of succession. We literally built our new forest on top of an old forest to speed up the natural succession.

We prefer to use wood for it will take the longest time to decompose, but if we don't have wood we can use other organic materials like banana trunks (which contain a lot of water and pottasium), bamboo, sisal or agave, maizestalks etc.

See pictures.

Note we only prune trees and don't cut them down for this reason. Wood on foreststssoils that is already composing is also a good alternative, they already contain the right microorganisms and fungi.

The wood wide web (www)

The latest insights about soil life are really mind blowing. Plants, trees and ecosystens are far more intelligent than we thought. Microorganisms and fungi play an essential role in our world. Some scientists even believe that bacteria and other microorganisms rule our world. Not a strange thought if we see how a virus, which is also a microorganism, hold our world in check. Some new insights reveal that even the bacteria in our gut dictate our choices in food but also our moods. We are rather a part of the web of life, than the erroneous thought of being disconnected from and superior to nature. Without microorganisms nutrients can not be digested by us nor our distant relatives, the plants. The focus in nowadays organic farming is to stmulate a good and healthy soil biology.

Since forests are more fungi dominated than bacteria dominated in syntropic agroforestry we focus more on fungi. The socalled mychorrizhal fungi is an interactive autonomous intelligent organism that can be compared with our internet and the word trade center in one, but a very ancient yet very efficient version of them. Through this network, plants and trees, trade nutrients with each other, collect water from a far and share information. Older plants can feed young seedlings by using this system but the system can be used for warfare too. For example when in a period of droughts too much antilopes roam around that threathen the survival of trees, the trees can produce a poisonous substance that kill the antilopes as soon as the first tree got attacked. But thanks to the wood wide web all trees start to produce this poison simultanously.
The fungi can extend the length of the roots with kilometers and thus it make water availaible from places where roots can't reach.

The connection between a tree and this www is initiated by tree that let sugars leak through their rootsystems. The fungi in need of sugars then connect the tree to the internet.

In our strife to create selfsustaining food forests we can't do without this intelligent network that eventually will manage our farm. Ernst Gotsch speaks of that we are not the intelligent ones but rather a part of an intelligent system (nature) and we should adapt ourselves to that intelligent system. Our function is to accelerate the natural succession of evolutionary stages in nature.

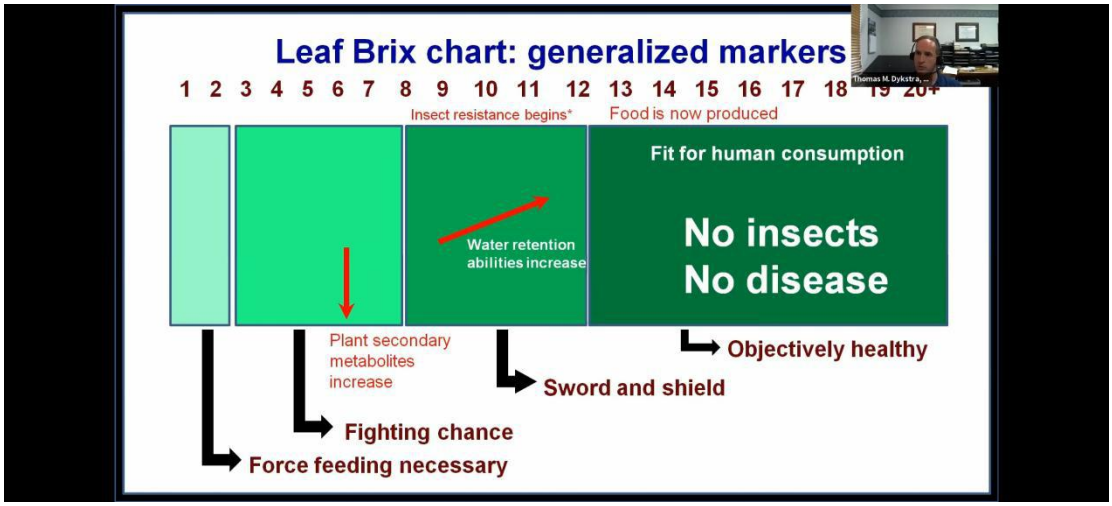
Pests

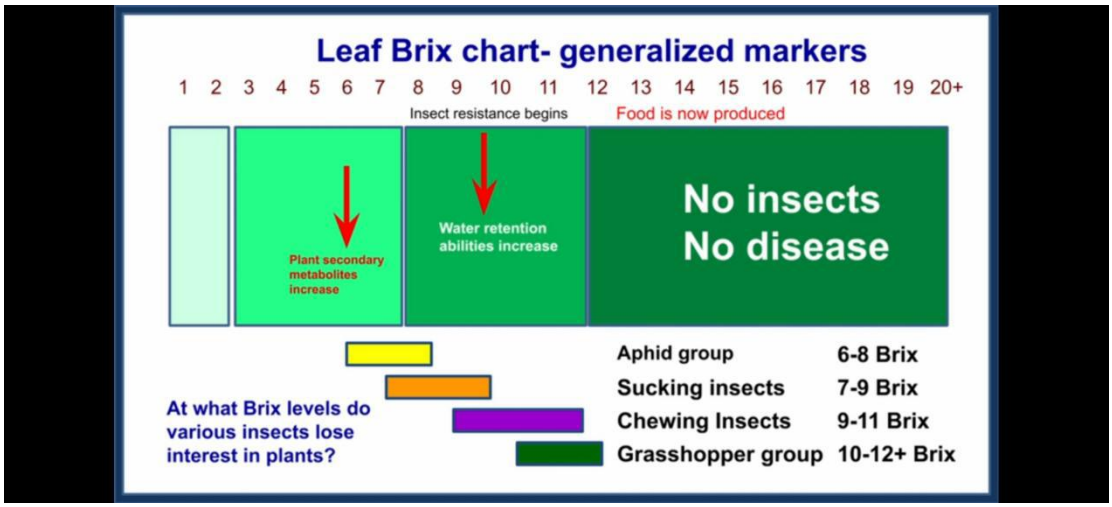
There are no such things as pests in the syntropic experience. According to Ernst Gotsch pests are agents of the department of optimalisation of life processes. Read that again yes. What normal agriculture considers as an enemy we on the contrary see them as allies that like the rest of nature want to reach to the state of abundance. Pests help us to remove sick or malnutrious plants. Sick plants give a bad aging or dying signal to the rest of the system so they should be eliminated. To prevent this from happening we must prevent our plants from getting sick. The first instrument

herefor is the maximization of photosynthesis. We should ask ourselves if our stratification is in check. Lower or medium stratas that grow in full sunlight can literally scream for help and pests are more than willing to help them out of their suffering. According Ernst Gotch plants and trees that are sick invite pests to get them out of the system. Compare this to our body, if we got weak or diseased cells the body tries to eliminate those cells for not the individual cells should survive but the body as a whole. Sick plants prevent the ecosystem to arrive in the stage of abundance. Sick plants attract pests by producing certain chemical substances that pests smell.

Another reason why plants ring the alarm by attracting pests is mostly malnutrition. Remember that most of our crops are not fit to survive in the colonizing or pioneering stage and suffer in the stage of accumulation, one might question oneself if we shouldn't reach in the stage of abundance first? It is exactly this what syntropic agroforestry want to achieve. Remember that normal agriculture organic and chemical alike reset their system to the pioneering stage everytime they till the soil. We can therefore state that pests are part of organic and chemical agriculture but become obsolete in synttropic agroforestry if we invest in biomass, the amount of organic matter in our soils and stratafication as a tool to obtain the maximization of photosynthesis.

How effecient the photosynthesis processes are can be measured with a brixmeter:





Taken from the excellent video presentation'Why insects do not (and cannot) attack healthy plants on youtube by Advancing Eco Agriculture

By measuring the amount of glucosis a plant is able to produce we can now measure if pests are still needed or not. If the result is still under 13 using chemical pesticides doesn't solve the problem, which is a malfunction of the photosynthesis process due to wrong stratafication, malnutrition, or the use of chemical pesticides, herbacides and fungicides. Killing the pests will only result in a stronger wish of your plants to get out of the system and therefore they will invite stronger pests to do the job.

Weeds

Another alien concept to syntropic agroforestry, for weeds are beneficial plants that in colonizing or pioneering stages function as plants that pave the way for other plants that will succeed them. The function of weeds therefore is to accelarate the succession and reach the accumulation stage in which they become obsolete. Most weeds thrive on poor soils and they indicate the nutrients that are lacking. Weeds will add those nutrients and by the weeds we can recognize what nutrient is lacking. It may seem that they compete with your crops but remember that most vegetables are not fit to grow in the colonizing stage and weeds do. To prevent weeds from growing we must make sure that their functions like covering the soil, (no bare soil !!), adding nutrients, providing diversity (versus monocropping) and photosynthesis are talen care of by our crops. That means dense cropping which leaves no physical space for weeds to grow, planting of a lot of biomass (like mombasa or napiergrass) and nitrofixing crops like beans and pottasium fixing crops like bananas. Don't forget the use of mulch in the initial stage of the farm that must be brought in from outside the farm before you can chop and drop your biomass.

Note: most weeds become obsolete in the stage of accumulation and will not grow in the stage of accumulation. Most weeds don't grow in fungi dominated humussoils of forests

Some practical stories

Why do we plant bananas?

One of the most powerful fertilizers and source of biomass is the bananatree! In syntropic agroforestry we plant bananas first and foremost for this quality. A bunch of bananas is a by product of accumulating so much energy as a banana do

.

We plant bananas for they deliver to our farms one of the most powerful fertilizers next to nitrogen and phosphorus; potassium. Besides that it's adding wet and spongy biomass to the soil, that built up a good soil quality so fast and thoroughly no other biomass can.

Today I cut down a toppled over bananatree that had to produce still to spread its potential through the farm. I had to feed some struggling papayas and also our coffee trees could need more biomass. Remember when it comes to mulch: when you think it's enough, add more ...



Weeds as biomass

Some morning chop and drop of the grasslines.

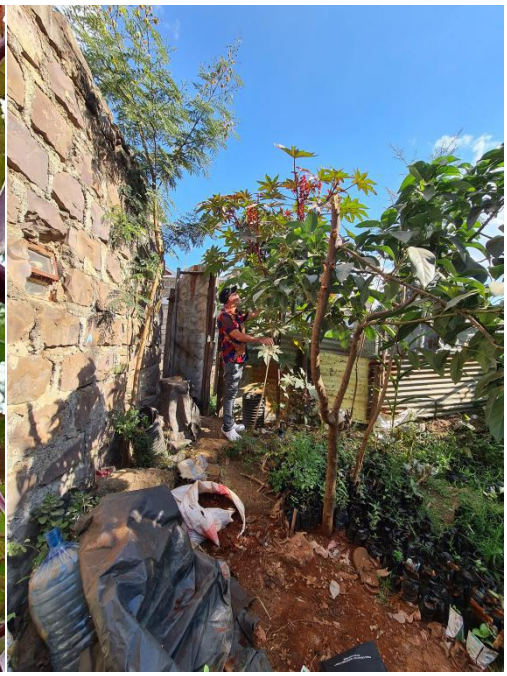
And of course weeds which can be considered as biomass too. Weeds are in essence pioneering plants trying to upgrade depleted soil. The poorer the soil, the more weeds. Weeds and ploughing are inseparable.

As we speed up succession weeds will disappear gradually when more biomass and woody materials are added on the soil. The more nutrients the lesser the weeds. And weeds hate fungi dominated soils. Fungi loves woody organic material. So chopping and dropping of biomass speeds up the disappearing of weeds.


Wonderful source of biomass

I completely disappear in the vicinity of this 5 months old castor plant. Because this enormous growth castor that grows also like weeds in both Curaçao and Kenya it is one of the most favorite biomass plants after grasses like Mombasa, Brachiaria and Napiergrass. In order to make a syntropic agroforestry farm independent from irrigation, fertilizers and pesticides we prefer to focus on biomass before anything. When enough biomass is accumulated we slowly move towards more production of crops.

Castor oil is a well sought product for its use as laxative and as massage oil. In the classic holistic health system ayurveda, castor oil is known as wonderoil

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Natural NPK?

Everywhere in Kenya you find Tithonia diversifolia or Mexican sunflower known as Maruru in Gikuyu and Akech in Luo. It's a plant widely used as biomass in permaculture and syntropic agroforestry. This plant can be used as a free source of the 3 mayor nutrients Nitrogen, Phosphorus and Pottasium (NPK) and its a good substitute for soil depleting chemical fertilizers. I use it as a limitless source of chop and drop material to protect, feed, nurture and improve the soil. It is widely used as a free of charge multi function natural fence with medicinal properties

If you want to plant vegetables you need to plant grass.

This is a saying often used in syntropic agroforestry. To understand this we must understand the importance and wisdom of natural succession. Succession is nature's way to accumulate more energy. And Nature uses plants that pave the way for plants that need more energy and that are also able to handle that much energy.
Most veggies need that phase in the succession in which more energy (read nutrients, biomass, the ability to store water, and carbon) has been accumulated. And grass is nature's pioneer plant of choice to generate that energy. Especially when that grass is pruned every 3 weeks and used to cover the soil. Pruning of grass generates growth impulses for all species, increasing of photosynthesis and adds nutrients like nitrogen and biomass to the soil.
It's now 10 months ago that we established the first urban syntropic agroforestry farm in Nairobi and it seems that finally the soil is rich enough to accept the growth of vegetables like kale and Swiss chard without being disturbed too much by pests. If we want to get rid of pests we need to continue chopping and dropping mombasa grass and adding it to the vegetable line. The plant health will reveal the quality of the soil

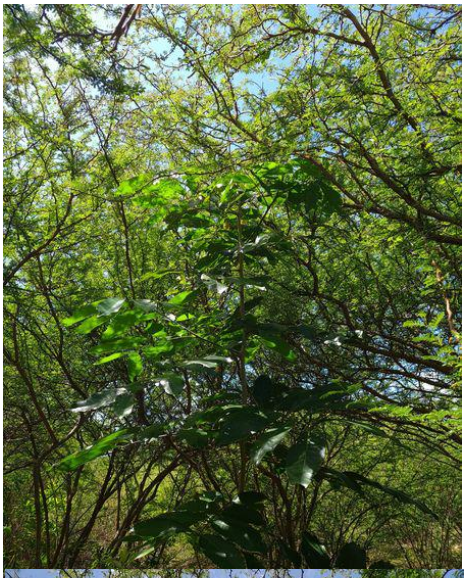
The importance of biomass before vegetable production

Tomorrow it is exactly 1 week ago that we did a management class for TOT students in URBAN OASIS. Today we witnessed an enormous growth. The secret? Pruning Mombasa grass causes them to produce Gibberellic acid, a growth hormone that is distributed through the mychorrhizal fungi network to all other

plants in the farm. At least if you keep your soils covered.The second aspect is covering the soil of the vegetable bed with all that pruned matter. That green mulch not only prevents the soil from drying out but it add a lot of nutrients to the soil. And last but not least it stimulates and protects the growth of the mychorrhizal fungi. Yes the same fungi that distributed the Gibberellic acid hormone to the vegetables.
Once again, if you want to grow vegetables you need to grow grass. Or any biomass for we used also Leuceana, Tithonia (Mexican sunflower), cassava and castorleaves.
Today I added more fresh pruned material to accumulate more energy (syntropy)
By the way, according Ernst Gotsch, that same mychorrhizal fungi can absorb water from the atmosphere and irrigate your plants.

Lead the ‘enemy’

Working in my favorite food forest in Curaçao. This is a try-out project of Greening the Desert Curaçao in which we wanted to accelerate the succession of a pioneering acacia forest (wabi). Although the wabi trees do their utmost they never seem to reach the next stage, the stage of accumulation in which more diversity will be the prelude of an abundant forest.



3 years ago we went in the forest to prune it drastically and plant out fruittrees that eventually will succeed the pioneering acacias. When we learned more about syntropic agroforestry we pruned the wabitrees more drastically and we brought in more biomass as nopal cactus, agave (sisal) and napier or elephant grass.
Right now we see that some of our trees are growing bigger than the acacias. And some acacias are already giving up because the accumulation of energy that's going on. Remember wabitrees are pioneering trees and survive easily in situations of entropy. But the more syntropy the less they are needed.
Today I pruned the acacias around the ackee tree(pics) the Spanish lime (kenepa) and the sapodilla (mispel) that grew sideways because it can't stand the shade provided by the acacias.
Now they will grow above the wabi trees and will shade them. Since the acacias are emergent trees that need the full spectrum of sunlight they will let the fruittrees succeed them because they don't like to grow in the shade.
All pruned nitrogen rich biomass of the wabis will create an enormous growth impulse and that will accelerate the growth of this food forest.
This is how you lead the enemy only to find out that they were never an enemy

Maybe I am crazy but 'the people who are crazy enough to think they can change the world are the ones who do.'

Today I had the privilege to fly over 5 countries, Kenya, Tanzania, Malawi, Zimbabwe and Zambia and I was struck by the similarity in brown drought stricken landscapes. When we arrived in Zambia I saw a lot of similarities with the landscape of my homebase in the Caribbean, Curaçao with a lot of stubborn dried up leafless trees. But at least they have trees.
Well I know not every place is supposed to be a forest, that savannas have their place too for the security of wild grazing animals that need to spot their predators on time.
But what I saw were remnants of savannas and my mind keeps telling me that this is not the way it supposed to be. Working with natural succession systems of syntropic agroforestry has given me the experience that any of these places can be turned into well maybe not always forests but at least lush green savannas even outside the rainy season.
The key is biomass. When there is enough biomass, even the slightest rainfall can be absorbed in the soil and kept there. And to me that is exactly our human responsibility to accelerate the amount of biomass.
Well these days we will create a syntropic agroforestry system in a completely sandy and desertified place where even the grass has dried up and, to make matters worse, burned
What will be the engine of regeneration, exactly that (Brachiaria-) Grass.
I can't help myself imagining green savannas and forests, maybe I am crazy but 'the people who are crazy enough to think they can change the world are the ones who do.' (Steve Jobs)

A few questions you may ask yourself

Nowadays I see more and more people posting pictures of their farms while borrowing the name syntropic agroforestry. I understand this for this way of farming has become more and more popular. But before you are able to call your farm really syntropic you may ask yourself if you follow all principles.
My teachers taught me 5 principles and of course there are more principles but let me focus on the 5 they taught me:
1) no bare soil / keep your soil covered always. (I see a lot of bare soils in pictures)
2) maximization of photosynthesis and 3) stratafication. How do you make sure that you catch and store all that energy of the sunlight? How you prevent that it's too much (waste) or too little (waste). So how did you organize your layers in your treelines? Just a few trees doesn't make it a stratafied forest.
4) succession, how is your long term planning? Succession means that plants create circumstances for plants that need and are able to handle more energy. Those plants will thus succeed their predecessors. A succession can start from day 1 but should continue into your forest of the future that will produce harvests for 20 to 30 years. Most important question to ask yourself is, what will succeed my current production line? A row of papayas is nice but once they grow older, what crops are already there growing to succeed those papayas? I can't imagine that as a syntropic farmer, you will tolerate that your system will go into a state of senescence?
5) management
How do you make sure that your stratas stay intact? How do you organize the unending need for biomass in your farm? What is the volume and percentage of said biomass in the farm? How do you use it to accelerate succession and the accumulation of energy?
Remember these are just a few questions you may ask yourself. In order for your syntropic agroforestry farm to be succesful make sure that at least you stick to the above mentioned

guidelines. You wouldn't love to see your farm slowly losing its energy and move into the direction of senescence or even entropy.

I simply cannot sit on the side while watching how millions of people will die an unnecessary death...

This really sucks! While some jokers deny the soil related climate change and droughts 50 million people are at the brink of starvation in East Africa. But even in this article they didn't mention the loss of organic material in the soil that brought back the rainwater infiltration rate from more than 60 % to less than 10 %. And thus all carbondioxide escapes in the air causing more heat.

It's frustrating to read this for we have the solution. Syntropic agroforestry focuses first and foremost on bringing back organic matter, biomass in the soil, recycling tons and tons of biomass in our farms causing our farms to cool down and preserve water.
Focusing on rainfall only makes us feel powerless while we can address the problem of biomass with syntropic agroforestry.
With my posts about our 'water can be planted technology ' I aim to reach the attention of those that have the resources and power to start huge syntropic agroforestry projects in the region to address both food security and climate change.
I simply cannot sit on the side while watching how millions of people will die an unnecessary death...

Why treeplanting is not enough or can even makes situations worse when it comes to regenerating watercycles?

Treeplanting is hip nowadays and planting of trees has become almost a heroic action. Most people seem to be aware of the relationship between trees and rainfall. The common thought has become, that trees combat droughts.
But is this really true? Or should it be that forests or ecosystems combat droughts?
Picture 1 shows a monoculture eucalyptus timber farm, a very lucrative business. However these kind of farms are not contributing towards more water, to the contrary they cause more droughts. And this is NOT because these trees are eucalyptus but because of the fact that it is
a) a monoculture farm
b) there is no stratafication
If there is no stratafication it means that the wind will blow in the forest and blows watervapor away and because the soil in the lowerstrata is not protected by canopies it got heated by the sunlight. The coolest place is in the canopies of the trees that are on top.

Watervapor moves from hot to cool so in this case watervapor goes from the soil upwards to the high canopies and escapes the system, causing the farm to dry out very quickly
On the second picture we see a syntropic agroforestry farm designed by Ernst Gotsch that is everything except a monoculture and you see clearly the different stratas intact.
There are 4 layers from Mombasa grass, to citrus, to bananas to eucalyptus. All those layers are cooling down the temperature due to intensive photosynthesis. The coolest place in the farm is the soil, hence the movement of watervapor towards the soil. The coolness of all those canopies generates condensation of that watervapor and thus water is being sucked in by the soil. No water escapes this second farm.
Needless to say that the amount of harvests is much higher in the second farm for income streams are generated from bananas, citrus and eucalyptus. This is where economy got fully supported by the ecology.
Water can be planted!

The relationship between old grass and droughts

Grass that is not regularly pruned will produce seeds and soon after that it starts dying off. It will go in a state of senescence. During the seed producing period the grass doesn't want water at any costs, to prevent the seeds from getting spoiled.
Since grass is part of an intelligent network it communicates this wish through the Mycelium network. Intelligent questions receive an intelligent answer: no water!
Traditionally this savannah grass has been grazed by roaming herds of herbivores, preventing the grass to reach this stage of senescence and keeping the grass young, strong and resilient. Young grass needs a lot of water and communicates that wish also to the Mycelium network. The result: water will be there. Remember nature is super intelligent!
Gone are the grazing wild animals, and if we want to combat the droughts generated by old grass, we need to take our responsibility and facilitate 3 things:
1) guarantee the return of the wild herbivores or
2) introduce rotational grazing by livestock guided by electric fencing or
3) chop and drop this grass regularly and build up more biomass over time. This biomass will generate more water retention and infiltration. Syntropic agroforestry management will definitely guarantee that these savannas stay ever green.

Note; the same can be said about the acacia trees that will keep their leaves due to the pruning and together with all that green grass increase photosynthesis. Photosynthesis will transform the heat of sunlight and carbondioxide into energy (food) and a cooling down of the ecosystem. This makes condensation of water vapor possible. And this will add to ending droughts.
Water can be planted!

Touch a banana leaf at the hottest time of the day

To those that deny global warming; I always remember standing outside our first syntropic agroforestry farm in Barber Curaçao in the burning heat. Then take one step in the foodforest and immediately I am surrounded by coolness. Manager of that farm Daniel G Parris will certainly recall those moments. And don't

tell me it's because of shade for try to stand in the shade of a concrete roof and that feels still hot.
It's because of all that carbon in the atmosphere being transformed by the process of photosynthesis into energy, the source of all energy. A forest is literally cooling because of the transformation of sunlight and carbon into sugars.
Touch a bananaleaf in the middle of a hot day; feels cool or even cold no? And thanks to that coolness of all those canopies watervapor in the air condensates and fall down as precipitation.
And another thing. Even in the dryest time of the year you can literally smell humidity in a forest.
So we can't deny the local cooling effect of our syntropic forests as a solution for droughts and global warming.

What is the need for thorns?

What's the need of thorns if a pioneering forest has been changed to the stage of accumulation? About a year and a few months ago we came in this completely dried up forest full with thorny Palu di Lele trees (Black Cherry / Randia aculeata) cactus and wabitrees (Acacia tortuosa). All we did was pruning the thorny trees to create a growth impulse. All the pruned material we organized on the soil to increase the organic material in the soil. After that we created treelines with a vegetable placenta and planted a lot of Mombasa grass. As biomass trees we introduced also Mata raton/ gliricidia
Without killing them and even after a heavy regrowth the thorny trees decided to leave the system voluntary. There is no need for thorns anymore when a lot of energy is accumulated. (syntropy)
Oh important detail. The dripsystem is not functioning anymore and this impressive foodforest has been without water for about a month


The abundance of assets that nature offers for free

Yesterday after a successful session of training new syntropic agroforestry teachers, we came to a common new understanding of poverty:
In an attempt to free oneself of historic social-economic preconditions of poverty by using the technology and insights of permaculture and syntropic agroforestry that promotes self-reliance and self-sufficiency, we must come to a new definition of poverty. This new definition of poverty is derived from the permaculture principle that any problem carries within it the seeds of a solution to it, in short, the problem is the solution.
Poverty is a mental state that unables one to see the abundance of assets that nature offers for free to create the conditions of a life that consists of an abundance of free food, water, energy, housing, information and matters of exchange and community.

Examples of those assets are, existing forms of biomass as potential building blocks of creating regenerative food producing forests, which multiply the above mentioned natural assets.
Building blocks could be:
Grasses, trees, seeds delivered by food items, cactus as raw material to build fences, any material that can be used as mulch, like leaflitter, straw, mowed grasses, woody branches that can be pruned from existing nitrogen fixing trees and timber, manure as delivered from animals in the surroundings like goats, cows, sheep, or chickens. Last but not least, ownership or custodianship of land.

The cause of this mental state is either the lack of knowledge about the natural tendency of nature to move in cycles of succession towards a state of an accumulation of energy, and abundance in other words, syntropy, or not making use of the above mentioned knowledge (mental lazyness)
Note: rural areas might offer more of those natural assets, especially when one owns land, than urban areas. In the latter it might take much more time to reach the state of above mentioned abundance.
Note2: existing laws and customs might be regarded as stumbling blocks so an entrepreneurs mindset is essential to move around this challenges.

A conviction became a reality.

A conviction became a reality. 3 years ago Daniel G Parris and I had this crazy idea that we could use the wabi trees (Acacia tortuosa) as nitrogen fixing trees in stead of planting non-native ones to feed our food forests. Why not using the thorny specie that nature chooses as pioneering tree and save a lot of work and destruction. It was our conviction that a pioneering tree will give up voluntary if other trees grow bigger than them and start shading those sunloving die hards.
Later we got our confirmation from the syntropic agroforestry knowledge that once there is enough energy accumulated, pioneering trees are not needed any more and will gradually make place for the forest that demands more energy (fertility, photosynthesis, water, etc)

And that's exactly what happens in our test food forest. Some wabitrees just can't stand that accumulated energy and die off. Those we took out today(last 2 videos)
In some other cases the wabitrees were blocking the sunlight for ackee, sapodilla (mispel), Spanish lime (kenepa) or guava. So in that case we pruned the wabitrees so that the above mentioned trees will grow taller than the wabis.

In this way we speed up succession (something that can take like hundreds of years) in a few years. All the pruned material we organized back on top of the soil to boost the fertility. This pruning will increase the photosynthesis and thus more accumulation of energy (syntropy). Check the difference in the green color of the Wabis and the lush green of our succeeding foodforest
Note: it's not a job without risks and you need good shoes and gloves like Daniel had and I forgot( ). Branches with long thorns are coming down, could and will touch your face,arms and legs and you have to mind your steps always...But no work feels better than greening the desert.

' it's kind of fun to do the impossible'

Water can be planted!
Just because it sounds unbelievable it doesn't mean that it is impossible! Walt Disney said once: ' it's kind of fun to do the impossible'
But to understand this technique you must understand succession within ecosystems. Most people consider ecosystems as static. But an ecosystem gathers more and more energy till it got enough energy accumulated that it can reach a more abundant stage.
According to syntropic agroforestry nature moves from entropy to syntropy, from simple to complex. Syntropy means accumulation of energy. While conventional agriculture moves towards entropy, the losing of energy.
Nopal cactus (prickly pear) and sisal or agave are exemplary for energy accumulaters for even without rainfall they accumulate water from the atmosphere. So in order to speed up succession to a next ecosystem that contains more water, nopal and sisal can be used.
These pictures are from a arid zone in Brazil that faces 7 to 9 months without a single drop of rainfall. This is the most practical example of that biomass comes for production because biomass equals water.
You can't understand syntropic agroforestry without understanding this principle of natural succession. (source of pictures: SAF's na Caatinga)

Water can be planted

Moisture moves from hot to cooler temperatures. And it's exactly for that reason why most farms lose a lot of water. By leaving the soil uncovered and sparsely planted the soil becomes the hottest place and thus water escapes from the soil by evaporation creating entropy (loss of energy)
Covering the soil with
1)thick layers of organic material
2)densely planted crops
3)layers of photosynthesis processing and cooling plants
4)densely planted African savannah grasses

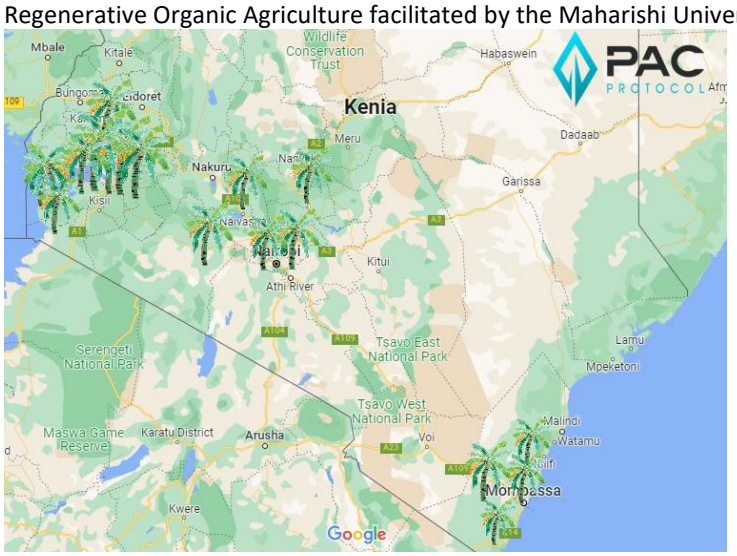
makes the soil cooler than the atmosphere that surrounds it and thus water will be pulled towards the soil in stead of escaping. Water will now be accumulated in the soil (syntropy) Water can be planted!

Roland van Reenen
Forest Farmer
Kenya 2022

This guide is dedicated to my excellent teachers Thiago Gimenez Barbosa and Murilo de Lima and my colleague Daniel Parrris

This simple guide is ment as an introduction to successional agroforestry,better known as syntropic agroforestry.Gratitude goes out towards Enst Gotsch the founder of this system although the autor never met him,his work was well represented by 2 of his students Thiago Gimenez Barbosa and Murilo de Lima.This publication is not ment to be complete,it is just an invitation to gain better insghts in natural processes that can be copied in agriculture.The real lessons will be taught by your farm and nature itself.

Roland van Reenen is an experienced syntropic agroforestry practitioner,student,teacher and consultant.After witnessing the astonishing results of the first syntropic agroforestry farm in the hot and dry island of Curaçao he became a very enthusiastic ambassador of its infinite wisdom.Although he taught about 1000 people in Aruba,Curaçao,Bonaire,Kenya,Uganda,Tanzania and Zambia he consider himself most and for all a student of this always inspiring and practical knowledge.Roland is also a Permaculture Designer and did his PDC with Geoff Lawton.Besides that he has been trained in Regenerative Organic Agriculture facilitated by the Maharishi University Iowa in Curaçao



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