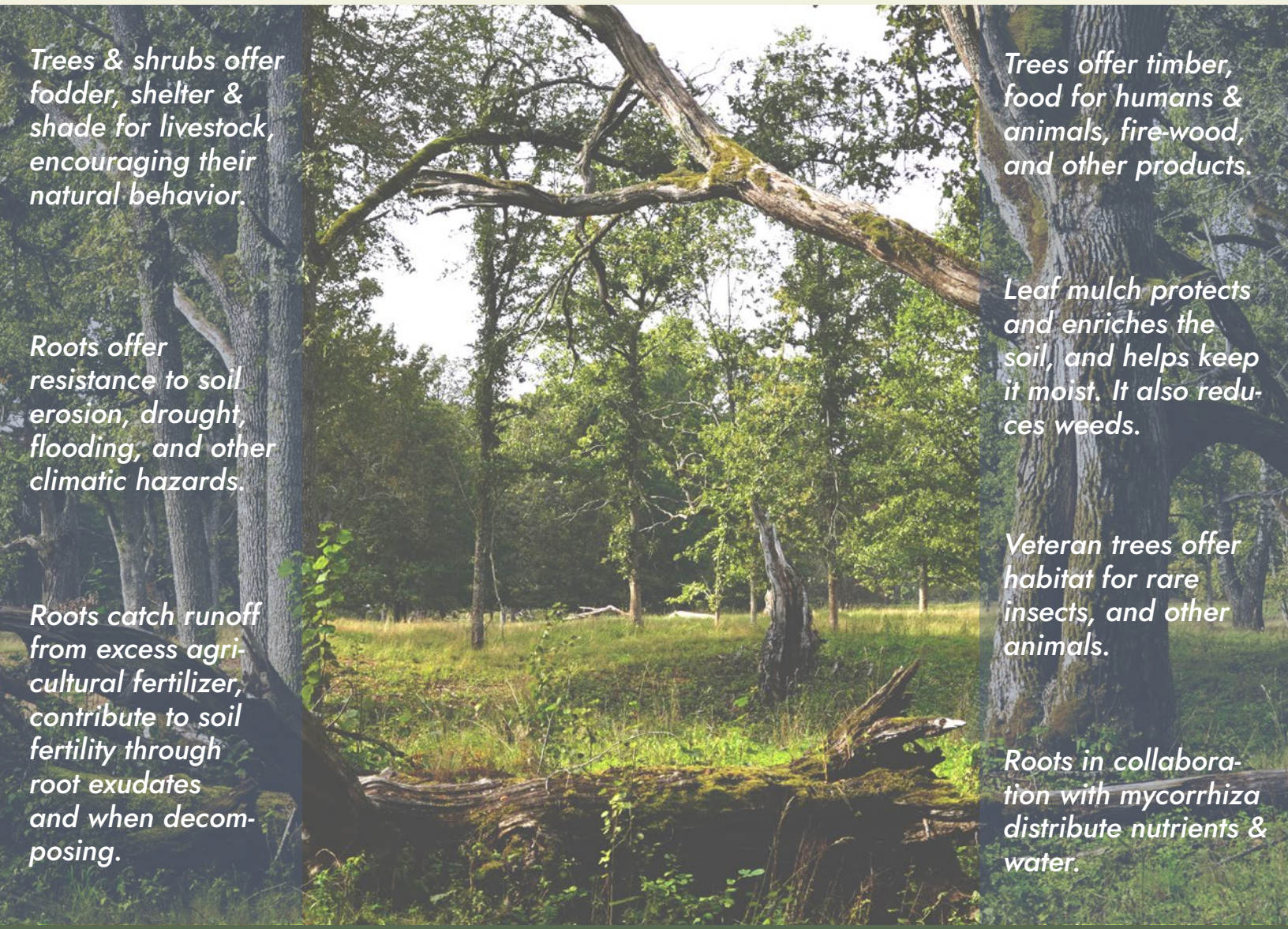
UNHIDE AGROFORESTRY

A KNOWLEDGE EXCHANGE LATVIA- SWEDEN 2023-25



LOOKING AT LATVIAN & SWEDISH FOREST GARDENS, FOOD FORESTS, ALLEY CROPPING- & GRAZING SYSTEMS THROUGH THE LENS OF CRISIS PREPAREDNESS, FOOD SOVEREIGNTY & BIODIVERSITY.

“The Oak is my father, the Linden is my mother, the Willow is my brother, I’m not alone”

– Latvian folk song

A knowledge exchange: Latvia & Sweden

“Unhide Agroforestry” was a Swedish-Latvian collaboration running 2023 - 2025, aimed to delve into primary production from woody species and the multilayered services and persistent work of trees and perennials in food producing landscapes.

The project consisted of four stakeholders: NGO Meža projekti, the Latvian State Forest Research Institute Silava, Permaculture Latvia, and Agroforestry Sweden, and involved two week-long road trips, the first in May 2024 in Sweden, the second in Latvia in September the same year, and engaged 12 participants from Sweden and Latvia.

The Swedish road-trip was initiated and organized on behalf of Agroforestry Sweden by Maja Lindström Kling and Anders Lindén, Rotverket AB, while the booklet was made by Maja Lindström

Kling, in dialogue with Anders, to summarise some of what we learned, what we reflected upon, and some of what stayed with us.

1. INTRODUCTION

MODERN EFFICIENCY AND SIMPLIFICATION HAS COME AT THE COST OF ROBUSTNESS

Uniform landscapes with vast monocultures, fundamentally altering the intricate tapestry of species interactions and energy flows that underpin ecosystems and biodiversity, have become a recognized concern. Without a rich variety of life, ecosystems become fragile and vulnerable, compromising their ability to provide essential services such as nutrient cycling, pollination, climate regulation and extreme weather mitigation.

MIMICKING THE EFFICIENCY OF NATURE

Agroforestry is a collective name for food production systems that have existed for millennia, characterised by a symbiosis of human activity and nature management.

Today, an increasing number of agroforestry practices, implemented on different scales around Europe, show that merging nature restoration with agriculture and forestry, in a landscape with more blurred lines, contributes to long-term resilience, biodiversity and productivity.

For example, hedgerows, small woodlands and even individual (especially veteran) trees can significantly increase the number of butterflies in farmed landscapes, and with agroforestry systems across Europe, insects attracting breeding birds - a biological pest control - have proven to return. In 2016 a comparison study was conducted be-

tween the 2,5 hectares Ketelbroek Food forest in the Netherlands, established in 2009, and a corresponding area at De Bruuk nature reserve, a Natura 2000 protected area with old forests, thickets and open, species rich grasslands. The question was to what extent the food forest could accommodate the native flora and fauna, by looking at birds, moths and ground beetles. The research concluded that the young food forest hosted more breeding birds, and significantly more moths and ground-dwelling beetles.

2. GARDENS, FARMS AND FORESTS VISITED

CRISIS PREPAREDNESS WITH NON-INDUSTRIAL AGROFORESTRY

For most owners and managers of the gardens, farms and forests visited in Sweden, food security and crisis preparedness is an underlying motivation and driving force in their activities and interest in agroforestry. At Väversunda berry orchard, an "emergency forest garden" with nut crops was established by Tor Nyberg in the early 1990s, drawing from experiences from crisis prevention by planting trees, due to a life-long engagement in the Swedish aid agency We-Agroforestry. At "Östergård farm" in southern Småland, a region with vast spruce plantations that was hit hard by the Hurricane Gudrun's devastation in 2005, Anders Rydén is managing underbrush in his production forest with grazing cows. He emphasized the importance of having forest grazing systems in place to avoid emergency slaughter when fodder is scarce following a dry summer. At Stora Juleboda farm, we learned how foraging in the edge zones saved the farm financially one year when a spring frost destroyed the apple harvest.

The Unhide project offered brief glimpses of complex processes shaping Latvian agriculture and forestry and a somewhat limited understanding of the sites visited. But it was clear to us that we have a lot to learn from the Baltic countries about maintaining a system of self-sufficiency in tandem with industrial agriculture. As a testimony, we repeatedly encountered people selling honey, sap, mushrooms, jam, pickled vegetables and home knitting at our road stops.

Pastures with magnificent oaks, Småland, Sweden.

Map: Sacha Nordén

With this project we wish to draw attention to and encourage a non-industrial agroforestry approach that is capable of living a life of its own, side-by-side with the official food production system, being characterized by a high degree of independence from both "value chains" and economic demands. The approach, shared by the Swedish participants; Katarina Holmdahl, Leo Sjöstrand, Jona Elfdahl, Maja Lindström Kling and Anders Lindén along with a handful of daily guest visitors, is to equate this independence with crisis preparedness. Consequently, this knowledge exchange has, in our daily discussions, come to be about food security, costs for redundant systems and the valuation of food production systems that function independently - even in the absence of labor, fuel, capital, value chains or skills.

3. ECONOMICS

THE REAL VALUE OF TREES - PRICELESS RESILIENCE

As everywhere else in society, there's a desire to calculate short-term economic profitability in agroforestry, to justify the longer-term, intergenerational investments in work effort, knowledge gathering and money needed to establish these long-term tree-based systems, not least since we live in a time when we no longer count on intergenerational continuity.

We would like to question this short-sighted approach. Calculating what apple trees, for example, will generate in terms of income after a few years in an alley cropping system is a quite simplified and misleading equation, since trees, just like humans, cannot so easily be evaluated in terms of measurable monetary benefits. While a person's merits can be priceless in terms of humanism, altruistic work or unpaid lifelong devotion for the common good, trees obviously contribute far beyond their yield.

During this project, a parallel was made between economic expectations of trees and of a young

To celebrate the summer solstice, men wear wreaths of oak leaves and women of linden leaves. Painting at the Skrīveri Agricultural Institute.

Pastures with magnificent oaks, Småland, Sweden.

person, illustrated with the famous photorealistic painting "Will you become profitable, little,-friend?" by Peter Tillberg from 1970 (Swedish Museum of Modern Art). It depicts a colorless elementary school classroom in Sweden, with students in straight rows of tables. The painting was a contribution to a larger debate about the impoverishment of the Swedish countryside after the "efficiency transformation" of society that was at the time underway.

Meanwhile, habits and beliefs are deep rooted, and the old-school industrial efficiency persists as a leading ideal at agricultural universities and institutions, as it fits better into yesterday's economic model. While climate change increasingly challenges farmers to partner with nature's ability to create balance, trees on farm land are still considered tabu. Arguing for example that "trees provide a reliable hydrology regulation in agriculture" is still met with skepticism, while demanding more covered drainage ditches in response to heavier rain falls remains status quo.

But, wouldn't a cost-benefit analysis of a completely independent food system be rational? - Even if that system is inferior in today's economic competition?

4. CONCLUSION

LIVESTOCK AND TREE CROPS INSTEAD OF EMERGENCY STOCK

To conclude, our perception of future landscapes is not solely agroforestry, but a myriad of solutions inspired by the vitality that food forests and woodland pastures provide.

During the road-trips, veteran oaks were a recurring and comforting feature, - a tree that hosts more species than any other tree here, that buffers large amounts of water and provides shelter, food and mycorrhiza collaborations. In Sweden we rested in the shade of magnificent oaks in ancient, species rich pastures. In Latvia, we learned about how sacred oak forests were cut down and burned when the country was Christianized, and how Latvian folk songs have perserved the love and respect for the oaks, still embracing pastures and homesteads.

LATVIAN FOLK SONGS HAVE PRESERVED THE LOVE AND RESPECT FOR THE OAKS - STILL EMBRACING PASTURES AND HOMES FROM ABOVE WITH THEIR CANOPY, AND FROM UNDERNEATH WITH THEIR ROOTS, ON BOTH SIDES OF THE BALTIC SEA.

Enjoy, and please contact us with thoughts or questions./Maja & Anders.

Participants from Latvia: Māris Narvils, Anna Bole-Williamson, David Williamson, Robert Daigins, Inese Upe, Agnis Graudulis, Dagnija Lazdiņa and Ilze Mežniece.

Leo Sjöstrand and Katarina Holmdahl.

Anna Bole-Williamsson & Inese Upe.

Väversunda berry orchard with Food forest, Sweden


Walnut tree *(Juglans regia)*


Sweet chestnut tree *(Castanea sativa)*


Tor Nyberg, Anders Lindén.

TOR NYBERG, A TREE LOVING PIONEER WHO BROUGHT AGROFORESTRY TO SWEDEN

VÄVERSUNDA BERRY ORCHARD is located south of Vadstena between Omberg and lake Tåkern. It started as an "after retirement project" by Inger Bjugård and Tor Nyberg, now in their eighties, and has since blossomed into a business with up to 40 employees during the summer season. Previously, Inger had a career as a food expert journalist and author of cookbooks. Tor worked as a forest inspector (Södra) and had a remarkable 20 year experience from agroforestry planting projects in East Africa with the Swedish aid agency "We-agroforestry" (Vi-skogen), operating since 1993.

For a long time Inger and Tor nurtured a dream to one day buy the Charlottenberg farm, having noticed the favorable growing conditions when passing by. The farm is located on a slope, a factor that reduces the risk of frost, partly in (the Swedish) cultivar zone 1. The site is dominated by sandy soils. In 1996 their dream came true.

Today the farm consists of seven hectares each of strawberry and rhubarb cultivation and eleven hectares of cherry orchards. Harvesting is done entirely by hand by seasonal labor from other countries, as with most commercial berry picking in Sweden.

THE FOOD FOREST

The purpose of our visit at Väversunda was the less commonly known 8 hectare "emergency forest garden" with established nut trees, at walking distance from the berry orchards, planted in parallel from the start in 1996. At our visit, Stefan Fogelqvist at "Freja FoodForest", who has been managing the Väversunda food forest since 2021, was our guide.

During Tor's long experience with crisis prevention by planting trees in Kenya, he realised that agroforestry was as relevant in Sweden, and this motivated him to bring the ideas of agroforestry home, and to learn how to apply it according to Swedish conditions.

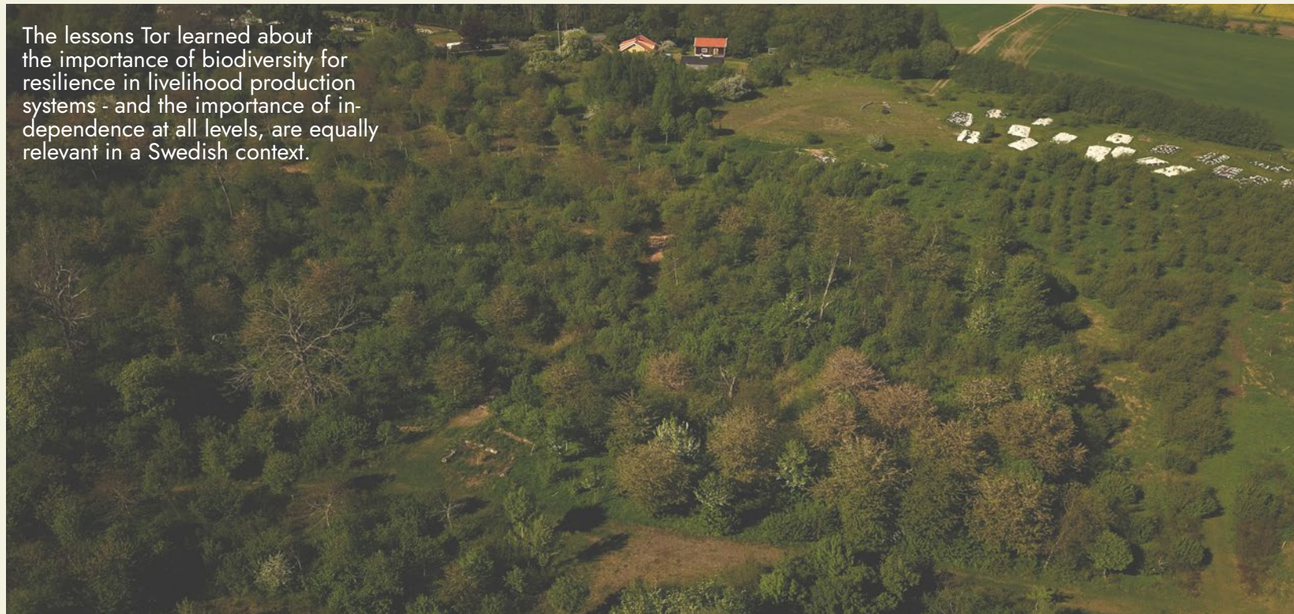
Initially, the intention with the emergency garden was resilience through the combination of high quality timber production and biodiversity, offering habitat and creating connectivity in the open agricultural landscape. The composition is 60% native tree species and 40% fruit and nut trees.

Walnuts (*Juglans nigra*), sweet chestnuts *(Castanea sativa)*, sweet cherry trees *(Prunus avium)* and the wild service tree *(Sorbus torminalis)* - an ancient-woodland indicator, providing pollen and nectar for insects, berries for birds and leaves for the caterpillars of moths, were planted relatively sparsely to provide plenty of room to grow.

With time the emphasis on timber changed to food security.

At the time of establishment, the land, which had previously been used as pasture, was overgrown with gray alder *(Alnus incana)*. Tor started by cutting it down to introduce new alder stands for nitrogen fixation.

At this time, nut seeds were not easy to find in Sweden. Some he got from friends, others he collected on his morning and evening walks in central Stockholm, he recalls. He also bought


The lessons Tor learned about the importance of biodiversity for resilience in livelihood production systems - and the importance of independence at all levels, are equally relevant in a Swedish context.

Väversunda berry orchard with Food forest, Sweden

Forested site with sweet chestnut trees interplanted with native tree species.

Walnut tree *(Juglans regia)*.

Hazels planted on less fertile parts of the land.

Nitrogen-fixing goat's-rue (Galega officinalis) sawn under the hazels. Cultivated as forage, bee plant, and as green manure to add organic matter to the soil.

grafted walnuts from Denmark. 4-5 hectares were planted in groups with hazelnut, sweet chestnut and cherry trees, and groups with walnut and hazel. Hazelnut plants were bought from Stångby nursery. Over the years, he was warned that these "exotic nut trees" would possibly pose a threat to native trees. "But trees don't choose their country, they choose their climate", Tor adds thoughtfully.

"AGROFORESTRY IS AN EFFECTIVE AND LONG-TERM INVESTMENT IN FOOD SECURITY, BUT THE INTEREST AMONG POLITICIANS AND AUTHORITIES FOR USING IT IN SWEDEN AS WELL WAS LUKE-WARM." - Tor Nyberg

Groups with walnut trees protected from frost by hazels.

The forest garden is fenced, but still, occasionally, wildlife finds its way in. Measures undertaken to reduce the impact of deer and voles are plantings of the pollinator flower Crown imperial *(Fritillaria imperialis)*, with a smell that keeps them away, and keeping the grass short to help hawks spot voles. Occasionally wild boars have entered, but without harming the trees. One year a badger took all the seeded nuts, Tor recalls.

WE-AGROFORESTRY

Vi-skogen's work began in a commitment to prevent deforestation and desertification in East Africa. The idea was to help farmers around Lake Victoria increase productivity by combining their crops with trees, to prevent erosion of the fertile soil. This would also help save forests from being cut down for fuel for cooking, as the tree systems on the farms would supply firewood. These trees, planted in crop systems close to the household were mentioned as "female trees", one of them being sesbania; a fast-growing, nitrogen-fixing and water-retaining pea plant, providing fuel for cooking. An example of "male trees" were eucalyptus, requested by the market and sold for timber, a practice that often results in desertification.

When Tor Nyberg took office as We-agroforestry manager the curb poverty donation campaign "Plant a forest in Kenya instead of giving flowers as a gift" had been a huge success in Sweden. Nurseries had been started in Kenya and tree seedlings distributed to local farmers. But due to the lack of experience many seedlings died, and the local farmers showed moderate interest. At this point Tor was given the task of better anchoring the benefits of tree planting among farmers.

With Tor's efforts, the larger nurseries established were replaced by training of local farmers, educating them how to start "home nurseries" to grow suitable seedlings themselves, and to guide them how to effectively use trees as a tool; one tree being good at providing shade, a second to provide fertilizer, a third to provide pest control, a fourth to provide firewood, a fifth serving as a fence. What could not be used as building material could be useful as compost and turned into soil.

Tor was a successful manager. During his assignment We-agroforestry became an independent foundation and employed 150 field workers. The mother nursery in Kitale, Kenya grew and expanded into the "Olof Palme Agroforestry Centre". The business spread around Lake Victoria to Uganda, Tanzania and Rwanda. A collaboration with SIDA developed, but became the cause of a long controversy in which We-agroforestry fought for its autonomy. There were other controversies as well.

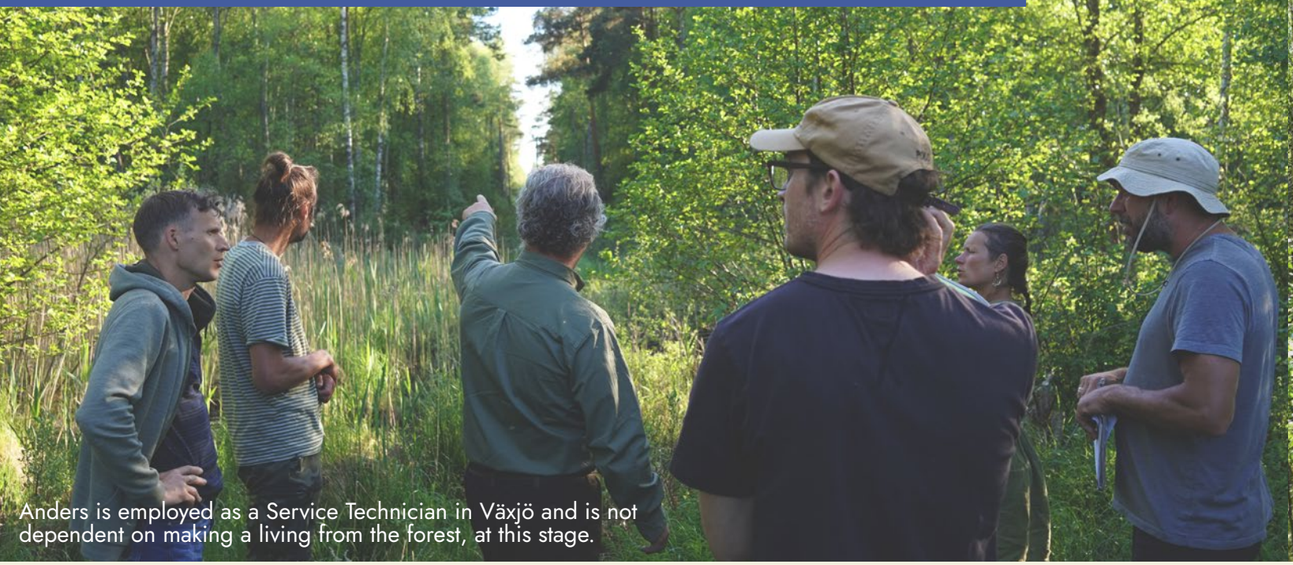
UNDER STATE PRESSURE, CYPRESS AND EUCALYPTUS WERE PLANTED AS MONOCULTURES IN THE SYSTEMS INTENDED FOR AGROFORESTRY, WHILE TOR ADVOCATED SILVOPASTORAL SYSTEMS WITH A DIVERSITY OF LOCAL SPECIES.

As a former forest inspector, Tor saw a parallel to the monocultures of spruce planted in Sweden: "spruce suits the forest industry, increased yield is the only thing that matters, and that view dominates both research and education."

The Charlottenberg farm includes about 140 hectares of forest that stretch up the mountain. 60 hectares have been converted from spruce monoculture to mixed and to deciduous forest, interestingly enough featuring species such as sweet chestnut, birch, wild cherry, poplar, and ash. "Diversity provides risk management and creates resilient forest systems," Tor points out. Also in early days, as a forest inspector at Södra, Tor was a pioneer, encouraging landowners not to clear-cut their pastures to plant spruce, but to assist the development of thriving mixed forests, managed using selective cutting.

- *In the farm shop hazelnuts, walnuts, strawberries, rhubarb, wild garlic, blackberries, cherry dogwoods, pears, peaches, apricots, chokeberry, quinces, gooseberries, currants of various varieties etc are sold seasonally.*

Östergård farm: Combined forest grazing & forestry, Sweden



Anders is employed as a Service Technician in Växjö and is not dependent on making a living from the forest, at this stage.

"GRAZING IS A TOOL TO CREATE MORE ROBUST ECOSYSTEMS" - Anders Rydén

ÖSTERGÅRD FARM. One of our much awaited visits during the road trip was Östergård farm in Vrankunge south of Växjö, a forest grazing system with a historical connection to nearby Urshult, known for its "fruit meadow orchards"; an ancient agroforestry system of combined pasture, mowing and "cow-grafted" wild apple trees. Here, Anders Rydén has been managing his production forest since 2017 with the help of Belted Galloway cattle, to suppress undergrowth, in order to get faster forest growth. A method that increases biodiversity.

When Anders inherited the family farm with 100 hectares of forest, the cyclone "Gudrun" (2005), one of the biggest environmental disasters in Swedish history, had blown down all the trees that were 30 years or older, mostly spruce. Anders' intention for post-storm management was a transition from spruce monoculture, which is severely threatened by drought, rot, storms, spruce bark beetle infestations and fire in southern Sweden, to a deciduous forest, which is more robust and suits the land better.

As a boy Anders spent the summers here with his grandparents, milking cows and helping on the farm. Apple trees around the farm gave the cows shade in the summer and shelter during harsh winters.

"CRISIS IS THE MOTHER OF INVENTION"

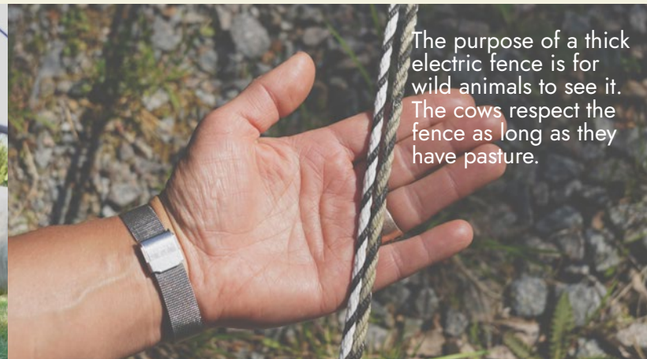
Managing the forest after the storm required unconventional help. "This was the trigger", Anders recalls, "for mental processes leading up to improved biological processes", realizing that favouring broadleaved trees was easier with grazing animals. Initially he fenced and let four cows in, to graze in the young forest. The new trees that had grown up (12 years after the cyclone) were large enough and not at risk of being damaged by browsing. Soon he made interesting observations.

"Thanks to the weeds and herbs that came in with the grazing, the soil was repaired. Now I have worms in the soil, next year there will be dandelions here. With the mixed forest and the presence of the cows, the birds have come back. The dung provides flies that attract these birds, which are then here when the spruce bark beetles swarm."

The diversity and improved soil flora also benefited the wildlife. "Thanks to the grazing of the cows, a more nutritious grass comes in after just a few years. When there is more grass in the forest, wildlife damage is reduced. Deer and elk are now to a larger extent content with grazing instead of browsing shoots."

Another conclusion was that the cows' grazing and trampling after only three years reduced the cost of the forest company's clearing by 90 Euros per hectare (a contractor costs 500 Euros per hectare, 2024).

The trees Anders favors are linden, beech, oak, elm, cherry and spruce, and with the thinning by browsing, the tree's growth rate increases. The cattle are especially helpful in thinning out saplings of rowan, aspen, alder and maple. As Belted Galloway cows are happy with leaner pasture, the forest grazing also saves money on expensive silage. By-products are linden honey, more berries in the forest and fantastic, locally produced meat.



The purpose of a thick electric fence is for wild animals to see it. The cows respect the fence as long as they have pasture.

Östergård farm: Combined forest grazing & forestry, Sweden

Linden is suitable for building sauna interiors, the Latvians noted.

The 30 hectares grazed forest is fenced and divided into three large areas. The herd has grown to 8 cows and a bull.

Anders calculates with one cow for clearing 1-2 hectares during 3-5 seasons. The time frame depends on the season. The recovery time is crucial in order not to overgraze or destroy natural values; when there is not enough pasture, sheep tend to eat bark and cows and wildlife browse buds.

To avoid overgrazing, the animals are rotated by controlling the availability of water and salt. By closing off one water station and opening the next, the cows move. The water tanks will eventually be replaced by rainwater ponds in sunny pockets, connected by ditches, while making use of the same system of allowing and restricting access.

"With this type of rotation, it's important to give the cows access to a road, otherwise they will make their own path and damage the trees" Anders explains. "The carbon in fallen branches goes into the ground when trampled, instead of being oxidized. Without the grazers, it is a huge job to clear the forest of branches. After the cows have grazed in the forest, it is easier to walk around, and we have lowered the risk of fire during the late summer."

Among Swedish forest owners there is an increasing interest in forest grazing as a tool for converting spruce plantations into broadleaf

"THE CLEARING MUST BE DONE MORE FREQUENTLY WITHOUT THE CATTLE, AS THE ANIMALS DO A MORE THOROUGH JOB. THE EARLIER THEY ARE ALLOWED IN BEFORE THE FIRST THINNING, THE BETTER THE FOREST GROWS. WITHOUT THE CATTLE IT WOULD NOT BE PROFITABLE."

- Anders Rydén

forests, "many would absolutely go for it", Anders believes, if there was a separate compensation system for it. "If you plan the forest grazing in a good way and avoid overgrazing, which was common in the past, the forestry companies as well should realize the benefits. What is missing in today's subsidies for forest- and mosaic grazing is the support for grazing as a tool to create more robust ecosystems."

The property also includes a stand of broadleaf forest, where Anders' flock of sheep will be let in. The sheep eat leaves and leave the branches, doing a good preparatory work before thinning. In addition, Anders states that they got rid of a lot of mosquitoes that lay eggs in the grass on their marshland, now it's more open and more pleasant to walk.

Going forward, Anders has plans to grow black walnuts *(Juglans nigra)* for timber and to use more animals for various services, such as the Swedish forest bread "Linderödsgris" that like to feed on nuts; a semi-wild pig which roamed the beech- and oak forests of southern Sweden until the end of the 19th century.

"Imagine a meadow or a forest edge where rose hip, Korean silverbush, honeyberries, walnuts, fruit trees and chestnuts grow with native species; plants that are beneficial to the animals and can be spread further by the animals. In such system combined with planned grazing, grass also has a function to fulfil, while normally, grass is something you try to avoid in a forest garden. Grazing animals eating fallen fruit reduce parasite infestations, disrupting the parasites' life cycle. This should also apply to the cow weevil (*Curculio nucum*) destroying hazelnuts", Anders figures. "Furthermore, nitrogen-fixing trees have green leaves later in the fall, making them an asset in a grazing system".

- *Anders' advice is to not let the cows use the same place for resting and grazing, as the dung will be concentrated in one place, leading to rotten tree roots.*
- *Forest grazing started to decline in the 1600´s when trees for charcoal and timber became an economically lucrative resource. At this time grazing started to be considered to negatively influence the regeneration of trees, while the real reason was the growing importance of the Swedish state and private businesses as forest owners, both having no economic interest in keeping animals in forests.*
- *Fäbobruk was recently inscribed on UNESCO's Representative List of the Intangible Cultural Heritage of Humanity - a traditional pastoral practice that was once the heartbeat of Sweden's rural economy.*
- *In Sweden, forestry and the forest industry is the largest driver of biodiversity degradation; thousands of hectares of trees are logged and replanted with new monocultures each year, without regard for climate stability, biodiversity and long term ecological health. This stands in sharp contrast to the country's particularly great responsibility, housing a large part of the EU's natural heritage in the form of natural continuity forests that have not previously been clear-cut. To reverse the trend and safeguard these invaluable ecosystems, there is an urgent need to protect and restore Swedish forests and to restructure Swedish forestry.*
- *Today, a growing body of literature from rural sociology, agroecology and conservation biology suggests that silvopastoralism, selective thinning and horse traction have great potential to enable multifunctional and biodiverse forests, as well as contributing to securing national sovereignty in terms of food, water and fibre.*

Boat in the Forest: Forest garden & food forest, Sweden

"In the beginning we had a lot of spacing ideas when planting trees. Now we trust our gut feeling, and the fact that nature with time will sort out what works best, at its own pace."

AT BOAT IN THE FOREST - harbour for radical nomads, Etta Säfve and Jona Elfdahl are working with reconnection processes; to bring back the underground relationships built by fungal threads, mycorrhizal trades and microbial alliances, and above ground to reconnect us, humans, to the same inherited relationship with the microbes, to each other and the invisible communities that sustain life.

The beautiful homestead includes food forests, forest gardens, nut cultivation, bio-pools with plants and biochar purification, each of them and together forming the basis for exploratory processes, with social & land-based permaculture and "close to nature" nut cultivation courses, workshops and artists in residence. Both Etta and Jona make a living as artists, guest teachers, process leaders and from seed collecting for an online ecological seed store.

The nut trees planted here consist of a large mix of walnuts, sweet chestnuts, hazelnuts and pine, and many different varieties of each tree, to create resilience and resistance to diseases. Thanks to the proximity of the Baltic sea and the southern location, autumns are very mild and walnuts have grown for a long time in the region.

THE SURVIVAL OF THE MOST CONNECTED IN A HUGE DIVERSITY

"I started this because my life in the city was millions of nothing. ...In the soil there are millions of everything", Jona states.

To enhance the underground cooperative exchanges that knit the living world together on their approximately 4 hectare site, Etta and Jona plant and invite as much species diversity as possible. This contributes to loosening up the soil in the "nut field", compacted due to earlier grazing by horses. As nitrogen-fixing trees and plants have a considerable impact on speeding up succession, they have planted hundreds of small common/ black alders *(Alnus glutinosa)*, as well as comfrey *(Symphytum officinale) and other nitrogen-fixers in "islands" around the nut trees.*

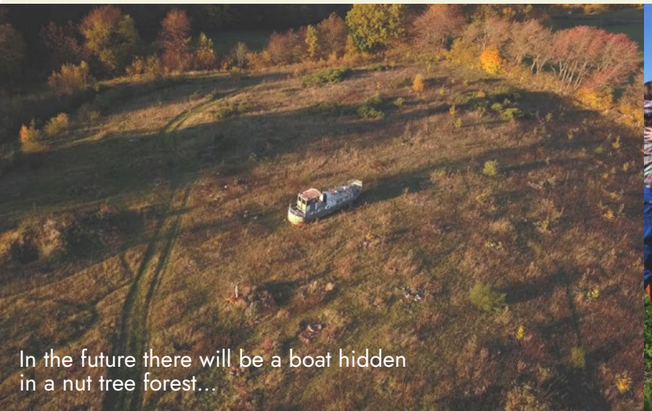
"The field with nut trees is quite nutrient poor, you can see that from the common broom *(Cytisus scoparicus)* and common gorse *(Ulex europaeus)* growing here. They wouldn't have come if there wasn't a need for nitrogen: they are niched on hard soil where there is very little nitrogen. Both are considered invasive. Our opinion is you definitely shouldn't remove what comes in naturally, as it will most likely have a positive function. Eventually our nut trees will shade them out", Jona explains.

According to soil scientist Dr. Christine Jones, a globally recognised expert on soil health, weeds aren't invaders but messengers; they show up because something else disappeared, acting as the voice of compacted soil, of imbalanced minerals and of collapsed microbial diversity. "The seeds of the weeds carry with them beneficial microbes, passed down from the mother plant, bringing in whispers of its origin ecosystem, and kickstarting the connectivity". The more diversity of plant families, the more exchange of microbiomes, passing from one root system to another, making the community become stronger, more resistant and more alive. Jones concludes that "it's actually not the survival of the fittest alone, but the survival of the most connected."

"MARRIED WINE-GRAPES"

Intertwined with some of the walnuts, Etta and Jona grow wine-grapes (Vitaceae spp.). "Wine-grape is a forest plant, it needs to cooperate with the fungus, but it doesn't do that in modern agriculture" they explain.

In nature one of the main roles of the vine is to cover and bring down weaker or older trees and allow succession to continue and complexity to increase. With the ancient technique "married wine", vines were grown between one tree and another. Often reeds were planted below the vines to create a framework for the grapes to rest upon. Thanks to the trees to climb on, the grapes grew several meters above the ground where they could access more sunlight, dry quickly after rain and thus avoid mold and mildew outbreaks. Such a system offered natural protection against com-



In the future there will be a boat hidden in a nut tree forest...

Etta Säfve & Jona Elfdahl.

Grafted sweet chestnut *(Castanea sativa)*.

Common broom *(Cytisus scoparicus)*. Invasive plants and weeds often prefer sunny spots, bare soil and are less dependent on mycorrhiza, unlike other species further up in the succession towards a forest. When clearing ditches along roads, or exposing bare soil for planting annuals, we create favorable conditions for these pioneers.

Boat in the Forest: Forest garden & food forest, Sweden

monplace vineyard diseases, and is an example of the benefits of growing a plant for production but keeping it in a semi-wild form, which allows natural defence mechanisms and ecological interactions.

To promote biodiversity and wildlife habitat, Etta and Jona make their own biochar and prescribed burnings - resulting, for example, in the appearance of fireweed *(Chamaenerion angustifolium)* which favors the conditions for walnut trees. They also emphasize the importance of dedicating an extensive area entirely to wildlife, to the benefit of generalist species (forest specialist species preferring continuous forest) and contributing to the extensive mycorrhizal network and connectivity in the landscape.

RESISTANCE & RESILIENCE

Etta and Jona harvest sweet chestnuts from large-sized, wild-spread trees nearby, to eat. They propagated many trees years ago and recently grafted with varieties from friends and thanks to non-monetary exchanges of plant material.

Sweet chestnut trees need to be placed in clusters for optimal pollination. The blooming around midsummer makes them safe from frost. Ripening, as in southern Europe, takes place at the end of October. Because they are high in calories and nutrients, sweet chestnuts have for long been grown in poor, mountainous regions with little cereal production, providing a basic diet - and autonomy.

According to the 2024 updated Swedish "risk list" for possibly invasive species (SLU species data bank) sweet chestnut trees are estimated to have a "high invasive potential but a low negative ecological impact."

Jona showing the water drip system.

The walnut trees get nitrogen with urine added in the water drip system.

We would argue that sweet chestnuts are not less "native" and not more invasive (when harvested for food) than wheat, and that a diverse system with sweet chestnuts is as much a "food field" as wheat, thus in favor of nature's recovery, something that an annual crop can never succeed with.

The group discussed invasive/ less desirable species, and whether this debate in the media is out of proportion, and concluded; today's monoculture agriculture and forestry is among the largest drivers of global environmental degradation, and are extremely vulnerable to climate change. This poses a more widespread, large-scale and acute threat - to ecology, economy and food security, and how to reform it should be of highest priority.

NEED FOR A "HUGE GENETIC VARIATION GRASS ROOT MOVEMENT"

With monocultures and monoculture like orchards, the risk of infestation of pathogens and pests arises, whether it is nut trees or cereals.

Etta and Jona stress the need to find resistant varieties to the major fungal diseases that are ravaging European chestnuts throughout Europe. "While Asian chestnuts (Chinese and Japanese) are resistant to Ink Disease and Chestnut Blight, it is crucial to create new disease resistant hybrids of Asian and European chestnuts, by planting chestnut trees of different species together and letting them pollinate each other to create new crosses."

This will be most effective if as many people as possible plant trees in different locations in the country, and when fruit bearing, plant the seeds from these trees, looking for cold-hardiness and large nuts in the selection - to generate a large genetic variety of productive, healthy chestnut trees for northern conditions.

At our visit, we had a group conversation about "societal collapse acceptance" and how to translate it into practical, long-term adaptation, taking our dependency on diesel-powered machines, the number of crops dependent on irrigation, pesticides and fertilizers, the size of the system and the number of animals dependent on external inputs into consideration. "The only way to reach sustainability is for the masses themselves to produce their own food. A few giants who produce for the masses leads to people who lack resistance or ability to withstand adversity. To some extent, we expect a collapse, at least in some part of the food system", Etta and Jona state.

"COMPARED WITH TRADITIONAL AGRICULTURE THAT USES A LOT OF INPUT AND ENERGY, THESE NUTS FALL TO THE GROUND WHEN THEY ARE RIPE. WITH SIMPLE HAND TOOLS YOU CAN PICK UP WHAT YOU NEED, WHERE YOU LIVE. THERE NEEDS TO BE NUTS EVERYWHERE, SO WE DON'T DEPEND ON LONG DISTANCE TRANSPORTS."

- Jona

- *Suggested reading: "Beyond the war on invasive species - a permaculture approach to ecosystem restoration"*
- *SLU's Species Data Bank: Reported finds of sweet chestnut in Sweden.*
- *Trees for fodder: Sweet chestnut leaves and sprouts have a long history in southern Europe as a nutritious "tree hay".Allowing unwanted spread of plants to become food for ruminants is more energy efficient than other eradicating efforts. For example, robinia leaves provide crude protein for ruminants. Slightly poisonous plants like robinia are generally doing good for ruminants, keeping stomach and intestinal parasites at bay.*

Lundens' farm: Silvo-arable, Sweden

The system has 20 metres wide alleys, and 4 metre wide refuges, a distance that is adapted to the farm's 8 metre wide seed drill.

LUNDENS' FARM east of Trollhättan is run by Anders and Annika Lunneryd, and has been in the family since 1942. Since 1999, the 270 hectares has been KRAV certified; no chemical pesticides or artificial fertilizers may be used. Before then Anders recalls that "the instructions of the pesticides urged me to protect myself with a mask and gloves. But hares and other animals in my fields had no advance warning to cover or hide".

For a long time he pondered using trees in the field to diversify the production and to increase agricultural resilience; trees that could photosynthesise even after the cereals had been harvested and serve as habitat for birds and insects.

The 14 hectares silvo-arable agroforestry/ alley cropping system was established by Anders and his son Sven in 2020 on a cereal field, with 38 different varieties of apples, grafted on MM.111 semi-dwarf rootstocks. The apple trees are expected to grow 4-5 metres high and the plan is to prune them. The trees have so far been heavily watered. When newly planted, the apple trees had a hard time caused by desiccation, due to wind. Moreover, the spring of 2023 was very hot and dry, and the trees became stressed, benefitting pests such as aphids and codling moths. So far, the ground under the trees is kept clear of vegetation, to prevent voles from thriving. When the trees have become more established, the intention is to plant other vegetation underneath, although no decision has been made yet.

NEED FOR NATIVE SPECIES SOURCED LOCALLY

Within agroforestry, the basic idea is to mimic the complexity of a living ecosystem to obtain a selfsustaining food production system. If oversimplifying this functional "architecture", we risk a monoculture, or an organic orchard design that limits the benefits of agroforestry. Agroforestry systems are defined by multiple layers and a structural-, species-, and age diversity, to make the system more resilient, and this should also apply in an alley cropping system.

Within the group we discussed the Miyawaki (Tiny Forest) afforestation method, used to restore degraded land on different scales, and its suitability also when planting hedges or treelines in agroforestry. The method mimics natural succession by densely planting a high level of native trees sourced locally, with as broad a genetic pool in plant individuals as possible, to speed up the mycorrhiza collaborations needed to rebuild soil microbiomes. When established, the tree line can improve the stress tolerance and survival among interplanted, more sensible trees.

"Before introducing sensitive trees such as walnuts or sweet chestnuts in the system, we ought to mimic natural succession; start with letting in pioneers - wind travellers such as willow, alder, birch and poplar who prefer sun and bare soils. When they've established, welcome in the midsuccession, semi-shade tolerant trees such as hawthorn, elderberry and bird cherry - bird travellers who accept both bacteria and fungi dominated soils. Finally let in sensitive and climax trees that depend on mycorrhiza collaborations, - naturally coming in with mammals and bigger birds"

- Wouter van Eck, Ketelbroek food forest, the Netherlands.

In Sweden we only have about 40 native tree species, but they form the backbone of the country's biodiversity, and thus it's crucial to integrate them, we believe, in agroforestry systems, and if needed to keep them low by coppicing and pollarding.

With a variety of native trees such as oak, bird cherry, willow, linden, maple and rowan, insects and birds would be attracted, and in return give an efficient, integrated pest management. Introducing plants typical of species-rich forest edges, such as blackthorn, European hornbeam, sycamore, hawthorn, mountain ash and Swedish whitebeam would also benefit biodiversity, especially as they rarely occur in plantation forestry.

We also mentioned the unfortunate fact that shrubs are not eligible for "tree farming" subsidies according to current Swedish regulations. Many shrubs such as alder, sea buckthorn, mountain currant, aronia, sloe, goat willow and other salix species would be good options in a Nordic adapted alley cropping system, being easy to propagate from cuttings and providing many ecosystem services without shading out annual crops.

A WELL ROOTED SOIL

The system has 20 metres wide alleys, a distance that is adapted to the farm's 8 metre wide seed drill, and 4 metre wide refuges. As shown in the photos, there is a lot of space between the apple trees.

In this system, a greater variety of root structures in the tree line would contribute more effectively to loosening the soil, improving the top soil, and strengthening the soil micro-life. A well rooted soil, covered with organic matter from decomposing litter and leaves, and a perennial ground layer also contributes to improved retention and infiltration of water, and decreased evaporation.

The optimal scenario is if the root system, with time, reached all the way underneath the alleys, connecting the whole field.

Such complexity of root structures is crucial for the efficiency of mycorrhiza, the fungal network that receives part of the plants' excess energy and in return connects roots of different plants in large networks, enabling communication and exchange of nutrients from larger soil surfaces and depths. Chemical pesticides and fertilizers used in the system would cause damage to these underground fungal threads.

SPREAD OUT DIVERSITY

Furthermore, by spreading out the apple varieties, rates of apple scab have proven to be reduced, according to comparisons between apples in organic orchards and apples in the Wakelyns Agroforestry system in England.

"In each hedge we have 8 species of apple, 2 of each, randomly spread out in the tree lines. This makes it more difficult for the pathogen to spread"

- Professor Martin Wolfe, pioneer of organic agriculture, cited in the film "Life within planetary boundaries - Agroforestry".

However, this may complicate a "rational" harvest. In discussions among the participants, allowing some apples to become food for animals and halt pruning of the apple trees was suggested. Lundens' grow spelt, rye, ein-korn wheat, emmer and "Lunden wheat" with large genetic diversity in

Lundens' farm: Silvoarable, Sweden

the mix, making it harder for pathogens to spread, as well as rapeseed, fava bean and grey peas, a field pea with a thousand-year history of cultivation in Sweden.

As the grains at Lundens' farm require nitrogen fertilizer from circulated waste products, the group argued this could be replaced by nitrogen-fixing plants such as sea buckthorn or common/black alder, making the system less dependent on industrial, linear economy.

A more diverse and dense system not only prevents run-off. For example, the spread of wind-borne diseases in annual crops have also shown to be reduced by tree barriers, according to research at Wakelyns. To avoid such a system becoming too dense, it needs to be pollarded. The residues left on the ground would improve the soil.

"Photosynthesis creates precipitation as it cools the immediate area around the leaves - hence we can plant water"

- James Godfrey Faussett, forest advisor, Miyawaki forest and nature restoration expert.

Along the fence, trellised B9 rootstock apple trees are planted. The group discussed the advantages of planting a surrounding poplar windbreak, or a temporary windbreak from fast-growing, soil-loosening, fertilizing and pollinator attracting industrial hemp, as it needs much less water than conventional crops, reduces drought caused by the wind, and provide shelter for pollinators and other insects who easily become exhausted by the wind.

The group also noted that autumn sowing might be the most suitable for this kind of system, now used for spring sowed cereals, as the trees would not leaf out in time to shade out the crop before summer harvest. With no road along the tree lines this is not an option, as it would result in crop destruction when driving along to pick the apples.

The largest cost in establishing the system was 16,600 Euro for fencing, to keep out deer. As income from apples is modest, the group discussed considering giving up fences in a system like this, and to expect some loss through deer damage. The money saved could be used for building a farm nursery, for diversification.

- *Since 2024 planting trees to produce food, feed or other ecosystem services in combination with annual crops on arable land is eligible for subsidies in Sweden. The trees may not cover more than 50 percent of the total area of the block/field. Nurse trees are accepted, and may be moved into the system, but can not be brought in by natural means. As agroforestry doesn't entail a static system, but one in constant life- and management cycles in interaction with surrounding nature, it's not fully clear how the rules will apply.*

Stora Juleboda farm: Foraging & silvo-pasture, Sweden

STORA JULEBODA is a KRAV certified farm on sandy soils, located on the coast between Åhus and Kivik and covers 100 hectares, divided into orchards, pastures, forest and cropland. Being next to the sea and the forest gives the location mild autumns but with a risk for late spring frost, when humidity sweeps in over the orchards. The farm is run by Anna and Marcus Callenbring, with help from their daughter Clara and a returning, seasonal working family. The former apple orchard differs a lot from the others in the region, (Kivik) famous for apple- and cider production. Here they grow apples, pears and plums, sea buckthorn, raspberries and American blueberries (*Vaccinium corymbosum*), hops, blackberries, black currants, rose hips and rose quince. Between the trees, priority is given to stinging nettles, fireweed *(Camaenerion angustifolium)* Phacelia *(Phacelia tanacetifolia)* white goosefoot *(Chenopodium album)* white clover, meadow-sweet *(Filipendula ulmaria)* and dandelions. In this environment, the natural enemies of insect pests, such as ladybugs and birds, thrive, Marcus explains.

Fireweed *(Camaenerion angustifolium)*.

The diversification is implemented through a farm nursery and in collaboration with plant breeders at the Swedish University of Agricultural Sciences (SLU).

"THE PLANT DIVERSITY IN THE ORCHARDS SUPPORT A LARGE NUMBER OF SPECIES: 28 DIFFERENT BIRDS HAVE BEEN SPOTTED"

- Marcus Callenbring

"In apple orchards four insect species are harmful, but there are several beneficial, and with a high variety of perennials, the latter are attracted", according to Marcus. He adds that they are fortunate to have a special ant living in the apple orchards that eats the larvae of the codling moth, a big problem in organic fruit production as they bore into apples and eat the cores.

The 40 hectare apple and berry orchard, with twenty different varieties of table apples and cider apples, are cut by Clara Callenbring in 3 weeks, at the beginning of the year.

Climate change is resulting in warmer days earlier in the year, with earlier flowering and fruit setting, and, at the same time with possible cold, "frost nights" until May, which put the apple harvest at risk. To avoid this, ploughing in the tree alleys, to let in warmer air, burning hay bales, and circulating the air, using a huge gas-powered fan on a circulating tractor, is a somewhat hectic and demanding job required, but is apparently making a difference, raising temperatures from minus three degrees to plus two. The group discussed whether it would have been appropriate to use apple varieties with later flowering.

Clara Callenbring in the "Perma orchard".

GRAZING

Species-rich woodland pastures and natural meadows, once defining the Swedish landscapes, have diminished significantly in the last century, due to the decrease in extensive grazing, despite it being essential for animal (and human) health, and crucial for national biodiversity goals. Huge socio-economic changes would be required to encourage and enable more mid- and small-scale animal husbandry with emphasis on landraces, adapted to survive on natural pastures.

At Stora Juleboda, a number of conventional pigs for meat and some of the Berkshire heritage swine breed are kept, and let in where they are

Stora Juleboda farm: Foraging & silvo-pasture, Sweden

To avoid frost damage a gas-powered fan is circulated with a truck in the orchard.

needed at work; to clean out land before sowing or planting new trees, or diligently turning the soil over and eating invasive weeds, such as couch grass *(Elymus repens)* and white goosefoot, and thus inviting other species to get a chance to establish in the orchard.

In conventional orchards, apple tree roots are looked after by cutting, as they are considered to get too invasive with time, Marcus explains, while at Juleboda, the pigs offer this service for free. Being grafted onto A2 rootstocks, the apple trees are very robust and can withstand a lot, including weed competition. Thanks to the presence of the pigs in the orchards, the voles are kept away.

The Berkshire pigs live outdoors all year around and have good resistance to cold temperatures, and simple nutritional requirements. The pigs are fed apple leftovers from cider production. When they have finished their assignment, they graze in the forest.

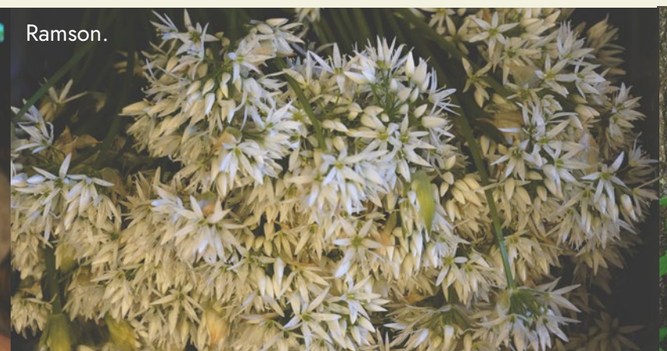
Chickens and sheep are also part of the work-rotating livestock. According to the family's research, the same number of animals were kept on the farm in the 17th century, as today. Moving of the sheep is done from horseback. During the dry summer months, the sheep are moved every day, there are a total of 32 fenced areas.

Regenerative grazing is about keeping and moving animals through pastures to improve soil-, plant- and animal health. Time is key, how long they are kept in one place, and for how long the pasture will be left to recover. This mimics wild grazing herds, whose natural behavior is to be in constant movement, instinctively keeping out for predators. This allows for plants to grow deeper roots, which reduces soil erosion (from overgrazing), and creates stronger resistance to drought; when the animals leave enough cover, water movement slows down during heavy rains, and this increases absorption. Deeper roots can also absorb more nutrients, which decreases contaminants in groundwater and reduces the need for fertilizer and pesticides. As animal feed and welfare is provided through forage, this grazing method significantly lowers expenses for farmers. "Our pigs feed significantly more on herbs than is commonly understood", Marcus notes.

"STINGING NETTLES SAVED THE FARM ECONOMY A YEAR WITH LATE SPRING FROSTS" *- Marcus Callenbring*

At Stora Juleboda farm, foraging leaves and herbs in the wild and in maintenance free edge zones is a remarkable asset, providing a substantial and stable income: the land includes foraging possibilities along a shoreline, forest edges and along a stream. Buds of hops and meadow sweet, dried and pulverised singing nettles, apple blossoms, leaves of black currant for tea, beach rose leaves, dandelion, ramson, leaves from birch and beech, and birch sap are hand-picked and sold to restaurants. Actually, nettles pay as much as apples - the salary is 27 € per hour and when sold to restaurants, the amount of one hour picking is paid twice as much.

Black currant leaves for tea.



Ramson.

Birch sap.

Hop leaves and young sprouts are a treat.

Österlen's arboretum: Edible landscape, Sweden

The entrance to the arboretum might be a little difficult to find, "hidden in plain sight", beyond the entrance of the famous Kivik Esperöd's Arboretum, established in 1922.

Anna Bole-Williamson and Fabian Ryft.

ÖSTERLEN'S ARBORETUM is located by the Baltic sea in Kivik, neighbouring the scenic Stenshuvud Nature Reserve. The 4 hectares are owned by SLU (Swedish University of Agriculture) and managed and developed by members of the non-profit Österlens Arboretum Association.

In the lush vegetation, over 1,000 rhododendron seedlings and seedlings of many other exotic trees and shrubs have been planted since 2007, to find out which ones are able to develop in the mild climate, and eventually, hopefully contributing to new exciting plant material in southern Sweden. In springtime, the lower parts of the arboretum are covered with an endless carpet of ramson. Large oaks and beeches spread out in the area are testimony that this was once pasture - the neighbouring Kivik Esperöd arboretum includes a European Oak *(Quercus robur)* that is estimated to be 1000 years old.

An ongoing experiment by one of the caretakers, Leo Sjöstrand - our guide at the visit, is planting grafted walnut trees and seeding black walnuts, after thinning out birches and other vegetation. The cultivars planted downhill since 2023/24 are Buccaneer, Broadview, Franquette, Lange van Lod, Maras 12, Solize and 139.

"My idea is to let *Juglans nigra* fill the niche previously occupied by ash *(Fraxinus excelsior)* as they die from ash blight, by directly sowing large quantities of black walnut where light gaps appear in the canopy, when the ash trees fall. In the long term, this could lead to very interesting hybrids between *Juglans nigra* and the grafted varieties of *Juglans regia* that we have planted here. Maybe similar to Dooley's hybrid which produces nuts that resemble Persian/English walnuts, but where the tree has a growth habit, appearance and hardiness that is similar to the black walnut", Leo explains.

Worth a notice, the grafted walnut varieties, some quite warm-requiring as the French Franquette, had spent the winter in pots in the arboretum, well protected by the dense vegetation, and overwintered without any frost damage.

The arboretum has a 40-year lease with SLU, ensuring continuity.

The long term wish, Leo explains, is to make this public recreation spot into a seed source and a learning site, possibly with a "plant station" engaged in plant exchanges.

Interestingly enough, walnut trees seem to prefer the same conditions as ash trees, and making use of the sun pockets resulting from fallen ashes, is a creative way to deal with assisted migration.

Another option would be to plant walnuts next to ashes, the group contemplated, recalling a story told that many walnut trees in Scania died during the harsh war winters of 1939-42, with the exception of a few that had ash trees as neighbours.

Is it justified to introduce walnut and sweet chestnut trees into Scania deciduous forests? If done with great care for native species and natural values, the answer is yes according to the group, arguing that the landscapes of tomorrow need to

- *In Nordic mythology the Tree of Life, Yggdrasil, is referred to as an ash that supports all creatures and represents the cycle of birth, growth, death and rebirth.*

Leo with one of his grafted walnuts *(Juglans regia)*

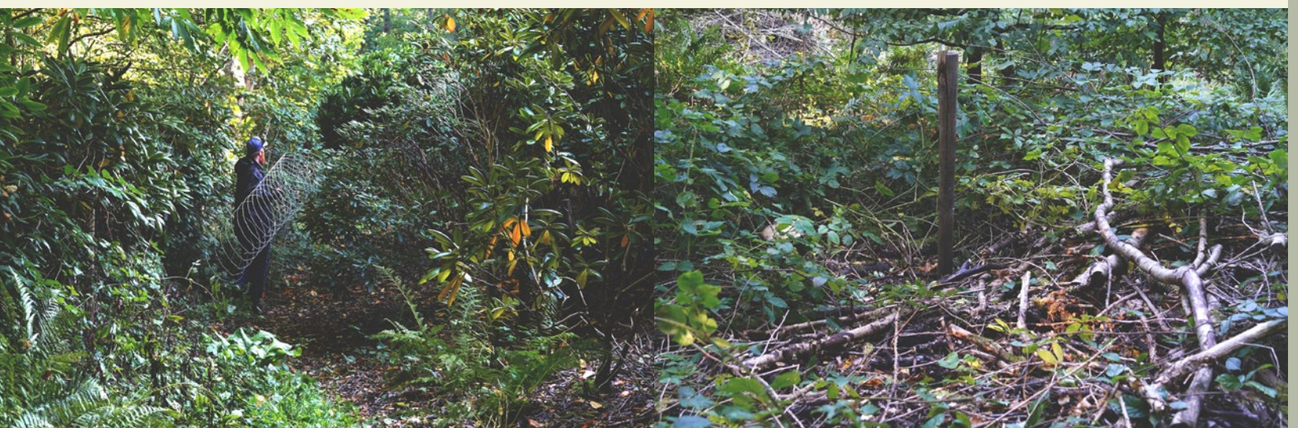
Österlen's arboretum: Edible landscape, Sweden

Ramson.

contribute to food and water security, as an equal goal with biodiversity, as we will not be able to pass on the fossil energy and other finite inputs sustaining today's food production to the next generations.

"Even though the world has gone mad and everything seems to go in the wrong direction, I find peace and comfort when spending my day in this prospering greenery. The contrasts are striking; here I mow ramson, while at the grocery store next door they cost the earth", Leo contemplated, while we rested in the coolness of the trees on this hot day.

Kivik is known for its many apple orchards, the first established in the 19th century. With horticulture entrepreneurs, other trees were introduced as well; today, several large walnut trees and sweet chestnut trees grow in gardens and in public spaces in the area. In the future, Kivik and Southern Sweden might be known for these nut trees as well, as they have started regenerating naturally.



FUTURE FORESTS IN SOUTHERN SWEDEN

- *Since the 1960s, landowners have received subsidies to plant spruce monocultures on arable land and pastures, profoundly changing the landscapes and reducing biodiversity in large parts of southern Sweden. Now the Swedish Linnaeus University is exploring the future of forests in southern Sweden, (The Oak Project) studying whether and how different oak species can contribute to increased biodiversity that are better suited to meet the challenges that come with the ongoing climate change, compared to the spruce and pine stands of today. A recent study from the same University reports that plant and insect diversity in Swedish oak forests increases toward the north.*

- *An SLU project has since 2015 tested whether two different types of hybrid walnut (Juglans x intermedia): NG23 and NG38 can be grown on a larger scale in production forests, for timber, and giving nuts while growing. So far, survival is at its peak and both grow very quickly.*

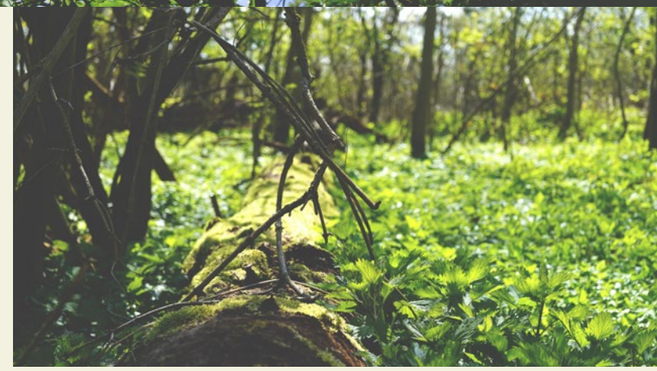
- *Thorny bushes can act as a nursery for fruit- nut or deciduous trees; the blackthorn slowly but surely withers in the shade of a few oaks or wild apples. Notably, the Celts considered the "oak, ash and thorn" a sacred trio. While thorn and ash offered a perfect nursery, with even temperatures, water and nutrients supply, the jay, famous for hiding acorns in sunny spots protected by thorny shrubs, assisted with the planting of the oak, symbol of the natural world and its enduring power.*

Walnut trees spread by birds, Simrishamn.

Rydeholm farm: Forest gardening, Sweden

The Swedish regulations for CAP-subsidies (Jorbrukarstöd) were adjusted in 2015, from being applicable for a minimum of 20 hectares of land to a minimum of 4 hectares. This plays a crucial role for Anders and others with similar plans. A subsidies cap of 5000 Euros for farms under 37 ha remains a significant barrier for farms in the 6-37 ha range.

Anders invites beech saplings to grow tall, to eventually shade the ground around his sweet chestnut trees to make harvest easier. The beech crowns will be kept under the sweet chestnut canopy.



RYDEHOLM FARM in Anderslöv, southern Sweden is an extensive food forest and 14 hectares demonstration site for Agroforestry, with a focus on nut trees and with the sale of forest products for restaurants.

The farm has been passed down for six generations. In 2010 Anders Lindén took over, and now lives here with Fanny Soupraya, their son Herman and one more child on its way. Anders' mother Anna Lena also lives on the farm.

Seen from the perspective of one of the numerous birds who also found habitat here, an old farm park constitutes the "core" of the food forest, holding the oldest and most well established agroforestry planting on the farm. Beech, linden, ash and maple have grown old and tall here, supporting interplanted sweet chestnut trees, as well as other unusual perennials benefitting from the very favorable growing conditions and the advanced mycorrhiza collaborations, such as ginkgo, pecan and Zanthoxylum. In more open spots, hazel and walnut trees have been planted, while Korean and cembra pines have been placed predominantly in the outer edges. Windbreaks, riparian buffers and alley cropping are also represented at the farm.

"USING WOODY PLANTS FOR BIODIVERSITY HAS A MULTIFUNCTIONALITY AND LONG-TERM PERSPECTIVE THAT IS OFTEN LACKING IN MORE CONVENTIONAL MEASURES SUCH AS FLOWER STRIPS AND CATCH CROPS." - Anders Lindén

The Söderslätt is a flat, open landscape, characterized by monocultures of rapeseed, sugarbeets, barley and wheat with no or few permanent habitats or green corridors for animals and plants to spread naturally. A few old, pollarded and now hollow willow trees along the country roads are the rare exceptions.

Since the beginning of the 19th century, 90 percent of the wetlands that existed in Southern Sweden have been drained, (which lead to the disappearance of the native stork) and the agricultural land has been deprived of trees, clearing the way for large scale farming. With support from subsidies, less profitable arable land and pastures have been planted with spruce monocultures since the 1960s, profoundly changing the landscapes and reducing biodiversity.

Examples of endangered species that have historically been part of this landscape, but have been disadvantaged by the lack of wetlands, meadows and woody and perennial vegetation are bats, hedgehogs, weasels, partridge, small birds, butterflies, wild bees, and salamanders.

In 1952, artificial fertilizers were introduced to farming here. The need for animal manure ceased and most of the typical southern Sweden farm buildings with enclosed cowsheds have since remained empty. "Agriculture and food production at odds with sustainable and rich ecosystems has been a constantly discussed issue on the farm since the time of my grandmother's father, when industrial agriculture made its entry", Anders explains.

With Sweden's new agricultural policy in 1990/1991 and Sweden joining the EU in 1995, Swedish food security policy was discontinued. Today the number of Swedish farms has reduced by 40 times, as they haven't been able to adapt to central and south European wages and pricing, along with a shorter growing season. Those who have survived have been transformed into hundreds of hectares of specialised units, largely subsidised by the EU.

In this context, and as the farm land was split up between Anders and his sisters, too few hectares

Rydeholm farm: Forest gardening, Sweden

Araucaria *(Araucaria araucana)*.

remained to run competitive, conventional agriculture.

Before his return home, Anders had spent five years studying philosophy in England, and during this time he came in contact with agroforestry and rewilding. This, combined with his passion for the natural values he was taught as a child when hunting and providing wildlife habitat with his father, led him to visualize the new identity for the farm; biodiversity and ecosystem services equivalent to wild, forest-like environments set as an equal goal with the primary crop production located in the canopy layer. "Now, three generations later, the trees in this otherwise open landscape will have their chance to gift us a truly sustainable agriculture".

The long term plan is a replacement of annual crops with tree crops - sweet chestnut and araucaria *(Araucaria araucana)* seeds as replace-

"ARABLE LAND IS THE RIGHTFUL PLACE OF TREES. TREES HAVE CREATED THE FERTILE TOPSOILS, BUT THIS PREPARATORY WORK IS TAKEN FOR GRANTED IN TODAY'S AGRICULTURE."

- Anders Lindén

ments for cereals and hazelnut and walnut as replacements for vegetable oil.

On three sides of the described core, 7.5 hectares of the land is, since before the takeover and until now, leased to a neighbouring farm and farmed with monoculture crops. Getting it back to grow nut trees was not a possibility until recently, as no industrial agriculture crop code for nut trees existed in Sweden. Without such code, there was no legal right to break up a lease, according to the Swedish regulations. Meanwhile Anders studied agroecology at SLU in Alnarp.

Eventually in 2020, the Crop Code (73 Nut farming) which applies to hazels and walnuts passed. At the time Anders worked as a teacher at a primary school and the lease had just been renewed for five more years.

Anders is the first person in Sweden to request "self-entry" (2025) with the nut crop code. In order to succeed, he has hired a lawyer to represent him at the Tenancy Board (arrendenämnden). The case is still ongoing.

The main crop when expanding the tree cover out into the open fields will be seed sown walnuts, interplanted with a diversity of fast-growing nurse trees, such as alder and poplar, that eventually will be thinned out. A mission that will continue for the rest of his life, Anders notes.

While waiting for the nut systems to produce a significant harvest (the present harvest is mainly used for seeding and for his own household), hunting opportunities offered by the system, hens, fruits and berries contribute to self-sufficiency to a smaller extent.

- *The sweet chestnut is an energy-dense food, due to its high carbohydrate content. In Italy it has traditionally been prepared as bread, pasta and in stews, and was recommended before hard physical work.*

"There is always a beautiful poem to contemplate or something thought-provoking to ponder about with Anders. Departing from Frans Vera's Forest and Pasture Hypothesis (the Vera Hypothesis and the Mega-herbivore Theory), postulating that open and semi-open pastures and forest pastures were the dominant type of landscape in post-glacial temperate Europe, - Anders and I one day of the road-trip landed in the conclusion that Western society, to feed a population required to wage wars, favored grass and bacteria before mycorrhiza, leading to mono-crop grains. But eventually gluten outsmarted our civilization; now we're addicted and in the hands of the industrial economy. We concluded that sweet chestnuts are gluten-free, and a perfect crop for emancipation!"
- Maja Lindström Kling

Bekas Family/Nature Demonstration Farm: Silvopasture, Latvia

"NATURAL GRASSLANDS ARE THE MOST ENDANGERED HABITAT IN OUR COUNTRY"

- Viesturs Lārmanis

In Latvia, as everywhere, intensive agriculture has transformed natural meadows and grasslands, including pastures with low intensity grazing, to drained arable land with monoculture agriculture, resulting in habitat loss and species extinction. In parallel, the lack of grazing, together with rural depopulation and land abandonment, has left agricultural land and pastures of less economic value being overgrown with trees, and this also defines the Latvian landscape.

Bekas is a family farm, demonstration site and learning centre for grassland restoration in northern Latvia. The farm is partly located in the Ziemeļgauja nature reserve, one of the country's most species rich Natura 2000 areas. The landscape here is shaped by the Gauja River which floods annually and erodes the sandbanks, meandering through grasslands with pine forests.

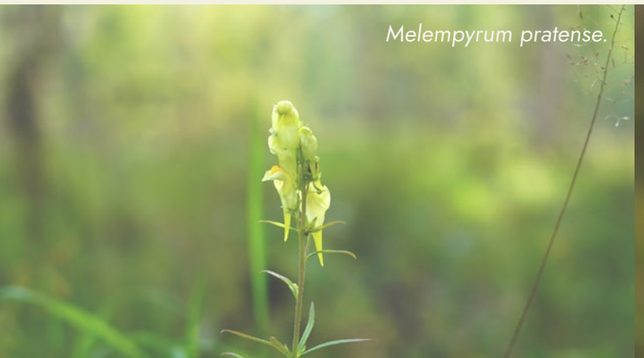
On the farm's 120 hectares, there are 11 types of woodland meadows, pastures and dry grasslands on calcareous soils; forests and aquatic biotopes in process of, or to be restored based on the EU habitats directive and Latvian regulations.

The farm's owners, Ines Gmizo-Lārmane and Viesturs Lārmanis have worked with nature conservation for over twenty years. In 2016, they moved to the family farm.

With the grazing of about 60 Scottish highland cattle, removal of trees and bushes, milling of stumps, sowing of semi-natural meadow plants, and mowing of varied intensity, they have successfully restored overgrown oak meadows, improving vegetation and species composition from forest vegetation to biologically highly valuable grassland vegetation, according to data gathered in collaboration with researchers from the University of Latvia (GrassLIFE).

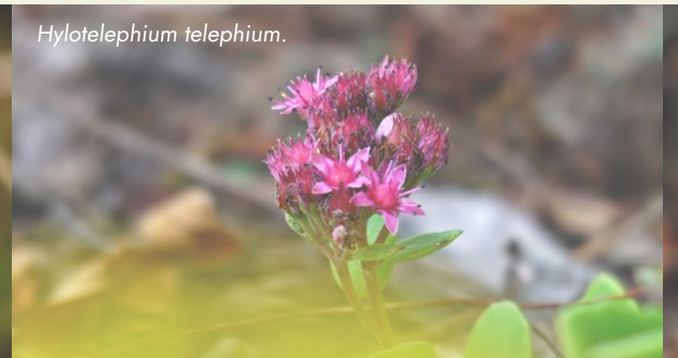
The Bekas farm hosts more than 50 protected and endangered species of plants, animals and fungi, such as the *Orchis mascula* orchid and the beetle *Osmoderma barnabita*, the most symbolic of the endangered species that characterize wooded meadows, requiring decaying wood in a network of veteran, hollow oaks, to provide suitable habitats and maintain viable populations.

According to Viesturs, the meadows here, creat-



Melempyrum pratense.

Filipendula ulmaria.



Hylotelephium telephium.

Veronica longifolia.

Bekas Family/Nature Demonstration Farm: Silvopasture, Latvia

ed in the days of pre-industrial agriculture are an important example of how agriculture can have a positive effect on biodiversity. The grazing and mowing that is now used to manage these meadows he refers to as "biodiversity farming". "Our Scottish highland cattle eat more than at least 200 different species of plants in their daily diet, so the meat that we produce is unique in terms of its origin".

The fact that the restoration measurements also included the removal of a beaver dam, sparked the group's curiosity and resulted in discussions, on the Swedish side, about the coexistence of agroforestry and rewilding. In Latvia the beaver population is considered to be too big (maybe explaining why we were treated to beaver meat at the end of the week) and to cause significant problems, such as flooding and damage to trees. At Bekas they are seen as a threat to the rare oak habitats and to migrating fish. But, as beavers are famous key species, playing a crucial role to their ecosystem, we assume this solution is also due to the beavers negatively influencing the water dynamics, hindering access to valuable pastures.

HISTORICALLY, INUNDATION, WATERLOGGING, UNEVEN TERRAIN AND EXTREMELY DRY AREAS MADE THIS SITE UNSUITABLE FOR INDUSTRIAL AGRICULTURE.

Still today, sandy soils and regular inundation and droughts contribute to the fact that there isn't enough land to feed the 60 Scottish highland cattle. The ancestors living from the land kept a lower number of cattle. To complement, the ruminants get hay with a rich meadow flora from other farms, making them become natural seed spreaders.

Since Viesturs, when asked, dismissed the idea of assisted migration of nut trees in natural tree meadows, we didn't have a desired dialogue about the merge of nature restoration and agroforestry on a landscape level, or about the importance of tree fodder, potentially from the same nut trees, to feed animals within the system, in case of too wet or too dry summers affecting the pastures.

Meat, honey, strawberries, wild berry jam, nature tourism for families and seminars: the family farm is exploring ways to finance its continued activities.

Māris Narvils & Robert Daigins

Ragāres: Forest gardening, Latvia

Jānis Vaivars shows how hazel bark is used to make tea.

Schisandra chinensis.

RAGĀRES HERB FARM in Skrīveri municipality, 80 km from Riga is run by Jānis Vaivars and his small family, who, along with the farm also inherited recipes, gardening and farming traditions from Jānis' grandmother and grandfather, scientists and agronomists at Skrīveri Agricultural Institute. Based on the conclusion that "organic farming is more sustainable, economically sound and has a higher average yield potential" they started Ragāres in 1982. Now the herb farm is well known in Latvia.

Around 100 edible fruits, berries, herbs and medicinal plants are grown on 7.5 hectares according to permaculture principles. The farm is located on a hill with a magnificent view of the river Daugava. In the centre there are residential and warehouse buildings and a more labour-intensive commercial garden with a greenhouse, where, at the time of the visit, chilli, physalis, tomatoes and lemon grass were grown among other crops.

All around, the garden branches out into room

A SELF-REGULATING ECOSYSTEM SERVES AS AN IMMUNE SYSTEM FOR THE FARM

formations with walls of trellised schisandra, mini kiwi and other fruit- and berry bushes and trees, creating a favorable micro climate, offering habitats, providing shelter, food, and breeding grounds for a multitude of beneficial insects — contributing to a a self-regulating ecosystem that serves as an immune system for the farm.

As fruits, berries and perennial herbs collect solar energy at different heights and absorb nutrients at different depths in the soil, all available niches are taken advantage of.

Herbs, leaves, berries and other crops grown here are made into various foods for sale at the farm, and through several other retailers. Their tea

Rubus idaeus.

Jona Elfdahl picking *schisandra.*

Actinidia arguta.

Ragāres: Forest gardening, Latvia

Echinacea purpurea flower with medicinal compounds.

Jānis Vaivars shows trees being tapped for sap.

Maple *(Acer pseudoplatanus)* tree tapped for sap.

recipes are designed based on medicinal properties, according to natural and folk medicine, such as "Echinacea vitamin tea" with echinacea, apple, apple tree leaves, black currant, blackberry, common nettle, purple coneflower, rosebay willowherb and sea-buckthorn leaves. Everything is picked and sorted by hand. The abundant diversity makes a stressful harvest season almost all year around, Jānis explains.

The site is embraced by an outer, semi-wild sloping edge zone that is foraged for walnuts, rowan berries, hazel bark for tea, maple sap etc.

Wonderful to see a business take advantage of such a diversity of landscape resources, especially in terms of woody species of plants. As all market gardens, the labour intensity, marketing efforts and constant innovation is taxing for the owner and Ragarès is a beautiful example of how woody plants can be either central or a valuable complement to such an enterprise."
- Anders Lindén

- *A report by Latvian Grass-LIFE shows that 71% of Latvians use medicinal plants such as mint, linden flowers and chamomile daily. For traditional sauna rituals, deciduous shrubs such as birch, linden and black currant are used. Fermented maple and birch sap also has a long tradition, and Latvian folk songs refer to the magical and medicinal powers of birch.*
- *"Nuts and berries from agroforestry systems in temperate regions can form the foundation for a healthier human diet and improved outcomes from diet-related diseases." (2023)*

Sambucus nigra.

Crocus sativus.

Vadakste Biodiversity Forest: Edible landscape, Latvia

Agnis Graudulis.

VADAKSTE BIODIVERSITY FOREST in south-western Latvia is a partially fenced 50 hectares, mostly forested area in flat terrain, on calcareous clay soils, surrounded by state-owned spruce monoculture plantations. Agnis Graudulis, a trained horticulturist and forester, began implementing his vision for his land in 2019; a seed source for biodiversity and trees for food and timber.

The ambition is to restore the vegetation to its original deciduous forest character in combination with adopting the concept of PNV, "potentially natural vegetation", in terms of reintroducing native vegetation and assisting the migration of new vegetation, as an increasingly warmer climate opens up new possibilities for planting nut trees. The land contains several systems of different types of vegetation.

A RANDOM, MULTIVARIATED SYSTEM: PLANTING TREES IN THE FOREST

Initially, what caught our interest from a Swedish perspective, to the point that we made a film about it, was several thinned out stands of pioneer grey alder *(Alnus incana)* grown on arable land with planted cherry *(Prunus avium)*, linden *(Tilia cordata)*, maple *(Acer platanoides)*, walnut *(Juglans nigra)*, sweet chestnut (Castanea sativa), larch *(Larix decidua)*, wild pear (Pyrus pyraster), wild apple, *(Malus sylvestris)*, beech *(Fagus sylvatica)*, oak *(Quercus petrea, palustris, rubra, robur)* trees etc to provide nuts, timber, honey and sap.

The trees planted in the forest are grown from seed and planted out with an earth auger, without fertilizers, wood chips or irrigation. Part of the forest plantings are done without fencing to compare possible browsing damage. Wildlife populations in the area are managed through agreements with local hunters.

Carefully establishing a food and timber system in an existing forest has several advantages:

- Taller trees around favor lower evaporation, resulting in higher soil moisture. Thanks to surrounding native trees, air movement is also more even, compared to grasslands, where the variation between day and night temperatures, sun and shade is greater. This reduction of heat and water stress, seems to result in both stronger growth in an early stage and in better winter hardiness — the winters here can be really harsh. A slightly late leaf-out and budding seems to favour young, frost sensitive nut trees.
- A species rich vegetation with structural diversity and a variety of ages in different layers provides for habitats for beneficial animals that regulate the presence of insect pests. A diverse vegetation also extends the pollen and nectar season for honey-bees, compared to a monoculture landscape, and can offer a pos-

Linden *(Tilia cordata)*.

Sweet chestnut *(Castanea sativa)*.

Vadakste Biodiversity Forest: Edible landscape, Latvia

Fruit trees interplanted in a thinned out forest, Vadakste.

sible extra income. The trees provide a wind barrier for these hardworking pollinators and other insects.

- Mycorrhiza collaborations with native trees effi ciently help the planted trees find water and nutrients, while the constant production of organic matter from a diversity of roots, trunks and leaves contributes to a fertile soil, improving plant survival and stress tolerance.

Furthermore, the land includes;
An open field, sparsely spread, orchard like alleycropping system with walnut *(Juglans regia)*, chestnut trees *(Castanea sativa)*, hazel bushes *(Corylus avellana)*, and fruit trees with common/black alders *(Alnus glutinosa)* as nurse trees, (without crops in between the tree lines). Urine is used to water around these trees and on fence poles, in order to keep wild-life away. The growth of the saplings in the open field, compared to in the forest system, is somewhat slower.

A mixed pioneer forest on former forest pastures with silver birch and weeping downy birch *(Betula pendula, B. pubescens)*, spruce *(Picea abies)* and patches of walnut trees in the understorey.

A stand of spruce ready for felling, which is gradually being thinned out to invite natural, broadleaf vegetation. Part of the thinned out areas are planted with linden, maple, black alder and seeded with linden, maple, sycamore maple *(Acer pseudoplatanus)*, oak, beech, apple, rowan *(Sorbus aucuparia)* and a bush layer seeded with barberry *(Berberis communis)* and European buckthorn *(Rhamnus cathartica)*.

Several scattered, old "landmarks" of oak, wild apple, maple, linden, ash and pine, with an undergrowth that includes bird cherry *(Prunus padus)*, hazel, gray willow *(Salix cinerea)* and bracken *(Frangula alnus)*.

A fenced polycyclic trial (with inspiration from this Italian system) with a mix of fast and slow growing trees (aspen, alder, poplar, willow, oak, beech and other hardwood species) supporting each other, and intended for continuous timber harvest.

A plant nursery established in raised sand beds, inspired by Swedish gardener Peter Korn at Klinta trädgård, to enhance the plant robustness and to minimise the need for extensive maintenance.

Other experiments are underway such as a newly established "tiny-forest" trial and a breeding project for sweet chestnuts and walnuts.

The work is done to some extent with small forestry machinery and by hired labor.

The last three years were spent creating microhabitats in the forest, such as dead standing trunks, stone piles and 'Mulmholks' - a nest box filled with mulch (remains of rotted wood, leaves and animal droppings) resembling the conditions that can be found in hollow tree trunks, intended for insects such as saproxylic beetles, that depend on dead and rotting wood for food and habitat. From 2022, the forest is a demonstration site for privately owned, sustainable forest management in collaboration with WWF Latvia and LatViaNature.

FILM: I'M A TREE, WHAT DO I NEED? (link)

This is an interesting example of how former arable land can be transformed into a multi functional system. Instead of removing the native, pioneer, nitrogen-fixing grey alders, they have been left to enrich the system. Vadakste can be an inspiration for southern Swedish forest owners, with suffering monoculture spruce plantations on former arable land, looking for a way to secure the forest as an intergenerational investment, for food security, timber and biodiversity" - Maja Lindström Kling.

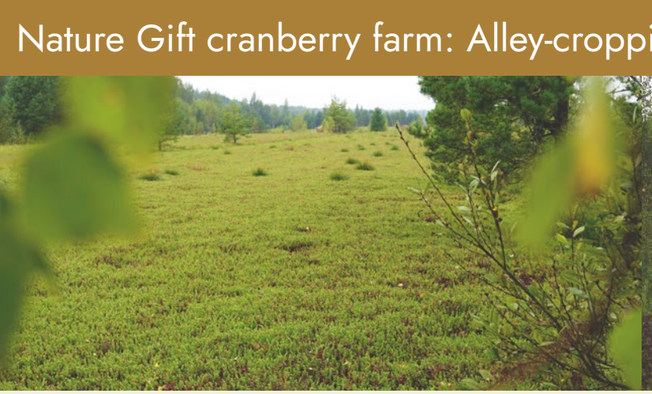
Black walnut *(Juglans nigra)*.

Walnuts *(Juglans regia)* planted under spruce and birch.

Beekeeper Toms.

Melampyrum nemorosum.

Nature Gift cranberry farm: Alley-cropping, Latvia



Andris Špats.

NATURE GIFT cranberry farm 31 miles north of Riga is established on a pristine peat bog. Andris Špats, who founded and runs the farm, explains that the protection provided by the pine and birch trees in the alley shaped cranberry system mitigates spring frosts, which otherwise risk damaging the flower buds. The trees also contribute to cooler surface and air temperatures during the hot season: the berries need cool summers and cold winters in wetlands with acidic and nutrient-poor soil, in order to absorb important nutrients and develop flavour and colour.

Latvia boasts a diverse range of peatlands, including fens, transition mires and bogs, covering about 10% of the country's territory. A considerable part of these peatlands are influenced by human activities, such as peat extraction, forest planting and land reclamation, requiring drainage that affects the hydrological regime and leads to habitat loss - pristine bogs and wetlands are critical habitat for many species and one of Latvia's natural treasures.

The Baltic countries have a long history of peat extraction and large areas have been exploited, mostly during and after the Soviet era 1940-1991. Many of these peat extraction fields have since then been drained and converted to agricultural land.

In the 1980s, commercial cranberry cultivation on former peatlands became popular in Latvia, and have since been advocated as an alternative restoration strategy, especially when the possibility of hydrological restoration is considered difficult, due to surrounding cover ditched and drained agricultural land, or when it is considered to be too expensive.

While some traditional cranberry farming practices involve flooding for harvesting, Latvian cranberry cultivation often does not, and drainage systems designed to ensure an average groundwater level of 0.5 meters, preventing waterlogging and root rot, are required. Irrigation systems are often used to supplement rainfall, for adequate moisture.

American cranberries (Vaccinium macrocarpon).

WETLANDS ARE CRUCIAL TO COMBAT FLASH FLOODING, ACTING LIKE A SPONGE, ABSORBING THE EXCESS OF WATER AFTER STORMS AND RELEASING IT MORE SLOWLY. WITH THE ONGOING CHANGES IN PRECIPITATION PATTERNS, THE IMPORTANCE OF THIS SERVICE WILL INCREASE.

Even though cranberry plantations provide ecosystem services, such as storage and regulation of water and nutrients, and creating habitat for birds, insects and amphibians, the value of these services is lower than in natural wetlands.

Can a berry plantation protected by tree lines be considered agroforestry? The Latvians suggest it could. It certainly seems to be a huge industry in Latvia. At our visit, bare, black soil stretched all the way beyond the Nature Gift scenery to the horizon, while the heavy machinery of another berry enterprise was preparing for new plantations.

With the exception of Andris Špats, a female workforce was engaged in the processing and storage of the berries, while Andris, showing us around, noted that "women are not mentally equipped to understand the complex processes that the berries undergo", which made us hesitant to include this system in the reporting.

- *Several LIFE projects focus on restoring and protecting priority bog habitats, including hydrological restoration and management. About 12% of Latvia's mires are now part of protected areas, under state protection.*
- *Sustainable and responsible after-use of peat extraction areas (2019)*
- *Greenhouse Gas Fluxes from Cranberry and Highbush Blueberry Plantations on Former Peat Extraction Fields Compared to Active Peat Extraction Fields and Pristine Peatlands in Latvia. (2024)*

Skrīveri demo-trial: forestry on farmland, Latvia

Goat's-rue (*Galega officinalis*) under the canopy of grey and black alder.

SKRĪVERI FORESTRY DEMOSTRATION TRIAL was established in 2011 as a trial for introduced, fast-growing and short rotation tree species and perennial crops with potentially high industrial yield for plantation on agricultural land in an increasingly warmer climate. The site is managed in a collaboration between the Agricultural Institute of Latvia, and the State Forestry Research Institute Silava.

Trees planted here are; Norway maple *(Acer platanoides L.)*, sweet cherry *(Prunus avium L. syn. Cerasus avium Moench)*, willow *(Salix)*, small-leaved linden *(Tilia cordata Mill.)*, birch (Betula pendula L.), poplars *(Populus spp)*, English oak *(Quercus robur L.)*, black alder *(Alnus glutinosa)*, grey alder *(Alnus incana)* and hybrids of alders and hybrids of aspens (*Populus temula X tremuloides)* and some native hazel bushes *(Corylus avelana L)*.

To avoid weeds and to effectively use the space between the trees, fast growing grasses and caulescent plants with high energy value were sown, such as Reed canary grass *(Phalaris arundinacea)*, Galega *(Galega officinalis)*, large leaf lupin *(Lupinus polyphyllus L.)* and Festolium *(Festuca sp.)* to produce industrial biomass for biogas and pellets. Where the sowing was not done, traditional meadow plants have come in naturally. Mushrooms such as Scaber Stalks (Leccinum spp.) also came naturally after a few years.

The trees in the trial are approximately the same age and size, planted in rows that are slightly sparser than in traditional Latvian forest plantations, but still have the same repetitive structure - a non random and no multi-layer order, creating less habitat and enhancing less biodiversity compared to a natural forest, food forest or a forest garden. Part of the experiment has been to test different fertilizers such as wood ash, residues from digestate production and municipal wastewater sludge.

Dr. Dagnija Lazdina has been involved from the establishment until now. In connection with the project, she is the main author of a report, to be used as a stepping-stone to introducing agroforestry in Latvia.

Our wish is that Silava will advocate agroforestry systems characterized by a diversity in age, species-composition and structure of trees and shrubs, with native trees functioning as nurse trees. In such systems, fertilizers are not needed and would damage the trees' own ability to absorb nutrients naturally. We also urge them to advocate for systems that can be operated independently of industrial inputs, to ensure resilience against economic and political challenges.

- *A possibility, instead of making bioenergy or pulp of small-diameter low value trees from thinning, is log cultivation of shiitake, chaga, reishi and oyster mushrooms, which have a decades-long source of knowledge in Latvia.*

"Interesting take on Agroforestry from the academic perspective of the forestry sector. Very large-scale industrial perspective on both cultivation principles and products"
- Anders Lindén

Anders Lindén & Dagnija Lazdina.

Inese Upe & Anna Bole-Williamsson.

Side income possibilities for forest owners suggested in the demonstration plot are honey production, coppice for basket weaving and sap.

Maris Narvils' farm Ēdenes Dārzs, Latvia.

Anna Bole Williamson's farm Līči, Latvia.

Anda & Waldis' farm, Latvia.

Anda & Waldis' farm, Latvia.

*The visit in Latvia included 8 sites, of wich 5 are reported in the booklet. Photos of the others abowe.

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