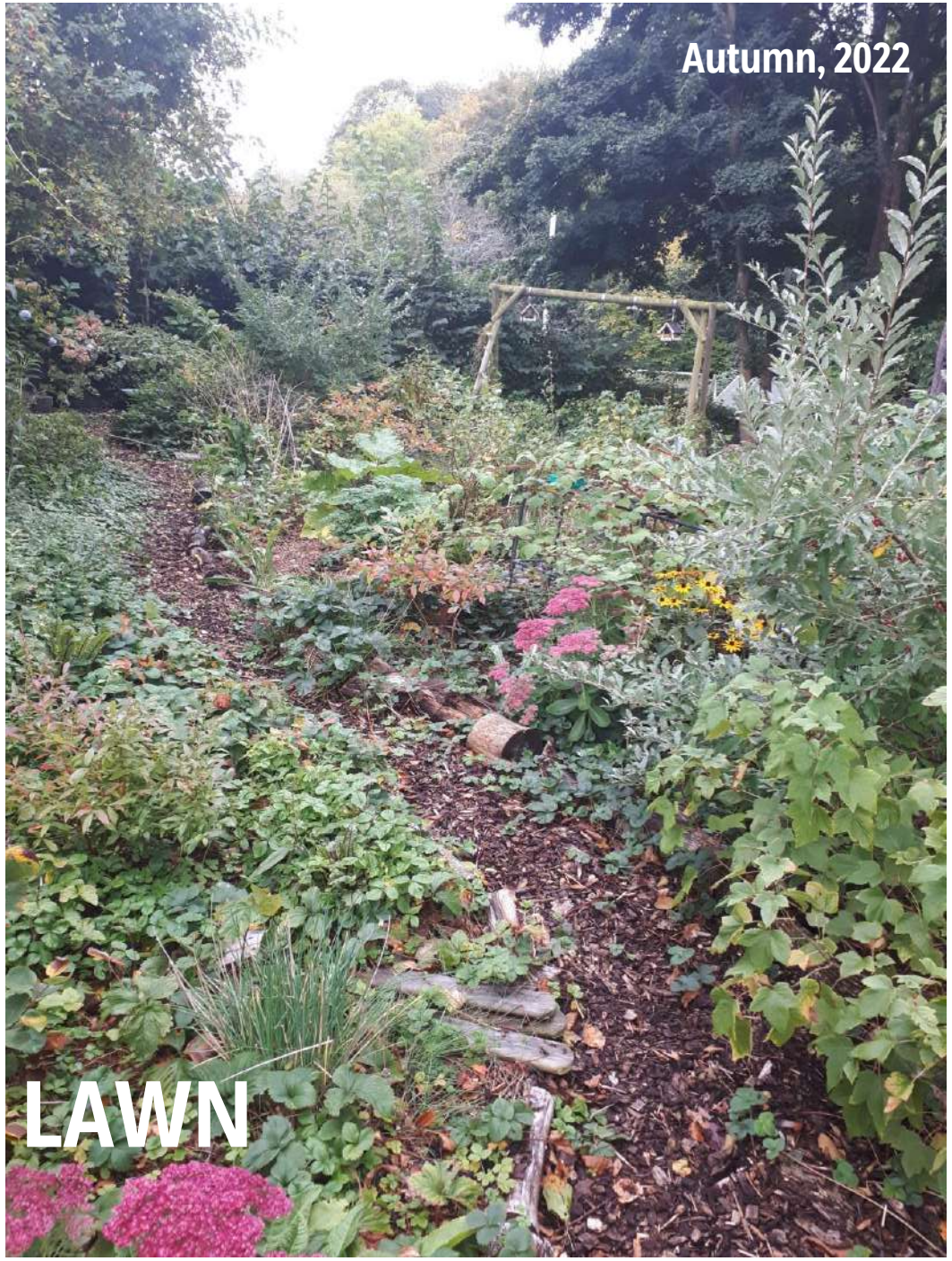


Forest garden design

Food forest for a villa garden to sustain a family of five

ABOUT US

A&B PERMACULTURE

- We are a family of five: a couple with three kids, a dog, and a 1600m^2 villa garden in the center of a small town Brande, Jutland, Denmark.
- We both work in the wind industry full time.
- Our permaculture journey started in 2018.
- In 2022 we started A&B Permaculture - a consultancy business focusing on the regenerative villa garden concept.
- In 2020 Aleksandra has started on the Diploma programme, first with Nordic Permaculture Academy; and later joined the Group Diploma Adventure, which is a UK programme offered by Looby Macnamara and Delvin Solkinson.

Brief

The work on this design was kicked off back in October 2019, right after I finished the PDC course. I was so inspired and so eager to try out the new concepts that I had just learned about: lawn conversions, perennial vegetables, the 7 layers of the forest garden.

This design is not state of the art in terms of use of design frameworks and tools. In fact, the design process was rather sporadic and highly implicit. The writeup was done in December 2023. I have tried to capture the process as precisely as it happened, because I think it's a fantastic illustration of what is possible to achieve, with relatively little knowledge (just two weeks of PDC) and zero previous practical permaculture experience.

I believe the closest design framework to fit my process is the GoSADIM design framework (Goals, Survey = collect information, Analysis, Design, Implementation, Maintenance or Monitoring).

Propagation of perennial vegetables: Sweet Cicely, Turkish Rocket, Black Oyster Plant; April 2020

Goals

Goal	Definition of Done	Ethics
Get more knowledge and practical experience with a variety of permaculture methods and concepts: - **Lawn transformation** - **Perennial vegetables** - **7 layers of the forest garden** - **Plants Guilds**	- Transformed lawns using one of the no-dig methods - Grow at least 20 different perennial vegetables - Understand what these are: how to propagate, harvest and use them. - Understand what makes a forest garden a forest garden. - Establish a forest garden.	**Care for people** Care for self – growing my knowledge and skills. **Care for earth** Based on model from nature: regenerative resilient fertile system.
Increase self-sufficiency with berries and perennial vegetables	- Berries every day during the season for children to snack on from the bushes (first realistic after 2-3 years). - Prolonged berry seasons, early and late varieties. - Perennial vegetables: a big bowl everyday consisting of leaves, shoots, stems and flowers during Apr-June.	**Care for people** Vitamins and anti-oxidants for family and friends. **Care for earth** Berry bushes are great for pollinators, all perennial plants are great for environment. **Fair share** Becoming a tiny bit more resilient and less dependent on the system / growing more food and creating habitat for wildlife.

… a bit more on ETHICS

People Care includes care for self and for others. It is about mental and physical health. Establishing a forest garden is a great way to take care of yourself and your family. Time outside, connection to nature, creating wilderness just outside your doorsteps, learning, enjoying, harvesting, being. No ornametal garden can beat that.

Earth Care is about care for the planet, for the living soil, for all life.

The question that resonates with me most is – will the land that you own today be in a better condition after your stewardship?

The endless grasslawns in the suburbian areas are like desserts. Earth Care is about replacing them with regenerative ecosystems, boosting biodiversity and soil health.

Fair Share has to do with our lifestyle. Our consumption/ overconsumption patterns, our sharing practices and care for future generations.

By establishing nature-like systems we are more able to care for and share our place with all the wildlife. By actively using our gardens and obtaining yield we are able to become more resilient.

Survey

Collect information
- What is a forest garden?
- What is a perennial vegetable?

Base map

Climate data
- Sun
- Wind

Satellite photo of our homestead, April 2019
Source: sdfikort.dk

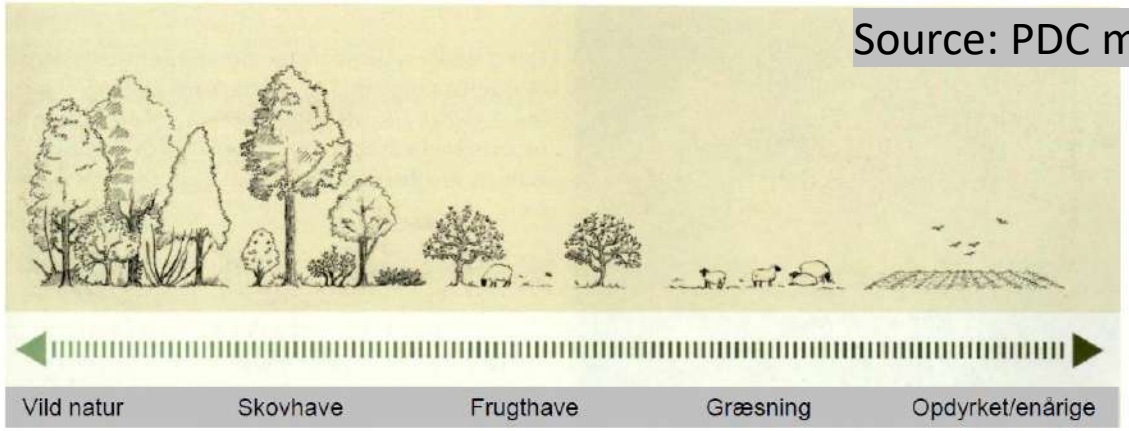
What is a forest garden?

An edible garden that looks and functions like a young forest, characterised by:

LOW MAINTAINENCE EFFORT
due to the law of succession

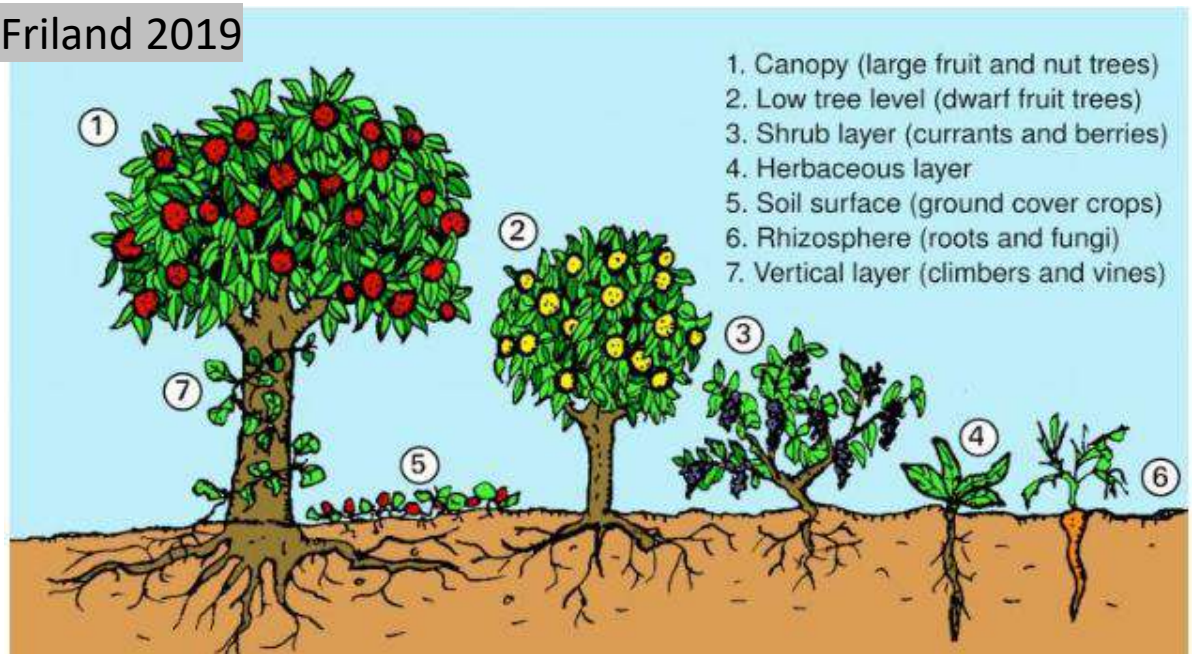
HIGH PRODUCTIVITY
due to the design of nature-like systems

Source: PDC materials, Friland 2019



- Mindre energi til vedligehold
- Mere modstandsdygtigt
- Højere biodiversitet
- Større forbindelse
- Lav/ingen vedligehold
- Lav/negativ drivhusgas udledning

- Mere energi til vedligehold
- Mindre modstandsdygtigt
- Lav biodiversitet
- Lav intern forbindelse
- Større vedligeholdelsesbehov
- Mellem-høj drivhusgas udledning



Everything wants to become a forest

Key words: vertical growth, the 7 layers, shade tolerant plants, perennials plants, plant guilds, symbiotic relationships, dynamic accumulators, nitrogen fixing plants, etc…

This section is based on ”Mad med flerårige grøntsager” / ”Food with perennial vegetables”
Thea Hestbjerg, Karoline Nolsø Åen, Tycho Holcomb

Perennial vegetables

What is that?

- Live/grow for more than 2 years
- They continue to live and grow after we have harvested them
- The plant that has to survive the winter will always seek to store energy in the roots (unlike annuals that store energy in the seeds)
- They shoot every spring without us having to start them again from seed
- They require less work
- The plant with permanent roots can absorb water and nutrients all year round
- They are more robust to drought or heavy rain

Black Oyster Plant surrounded by Sweet Woodruff, May 2021

Perennial vegetables

Examples:

- Rhubarb
- Asparagus
- Hostas
- Ice plant
- Orpines
- Hop
- Stinging nettles
- Ground elder
- Dandelions
- Bell flower
- Sorrels / docks
- Mallows
- Daylillies (some)
- Black oyster plant
- Turkish rocket
- Good King Henry
- Caucasian spinach
- Bladder campion
- Sweet cicely
- Pink purslane
- Great pignut
- Japanese mugwort
- Bronze fennel
- Bistort
- Perennial kale
- Solomon's seals

Groundcover of bistort and wild strawberries

Good King Henry in front of hosta and black currant bush

Perennial vegetables

What can you eat?

- Leaves
- Shoots
- Flowers
- Stems
- Buds
- Seeds
- Roots


Leafy greens in June


Edible flowers in August

Good king henry shoots


Turkish rocket

[Perennial vegetables (abpermaculture.dk)]

Perennial vegetables

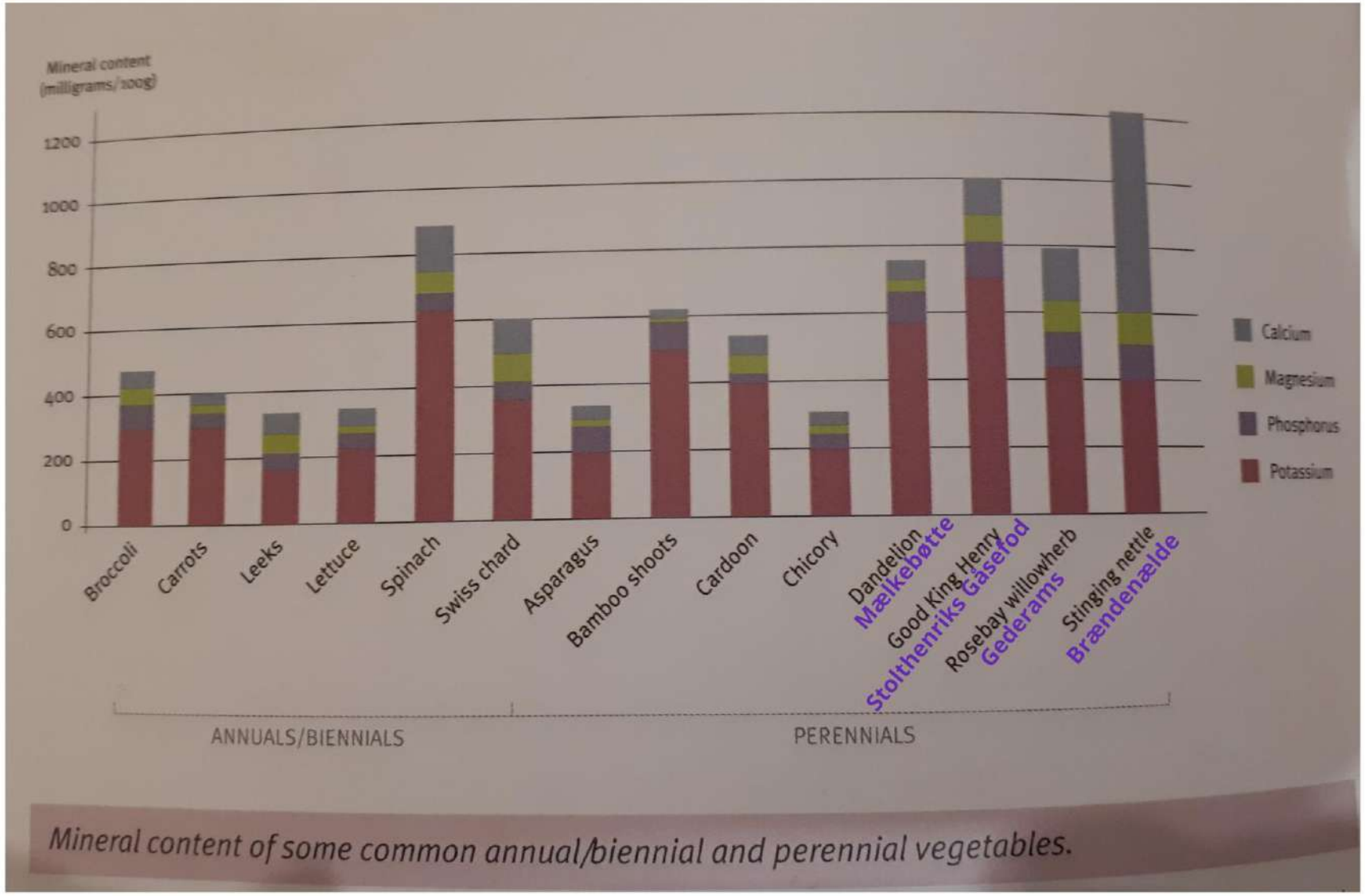
Leafy greens are known for:

- High content of fiber, which benefits useful bacterial flora in our intestinal system
- High content of vitamin C and vitamin K
- Often also beta-carotene vitamin A
- High concentrations of calcium, magnesium, iron and many other minerals
- Remember! Must be taken with fat (oil) for good absorption
- High content of alpha-linolenic acids, which are converted in the body into omega-3 fatty acids

Real superfood!

Bloody dock in front of a blueberry bush, June 2021

Perennial vegetables



Minerals in the annual and perennial vegetables.

The well-known annuals are still full of healthy nutrients and good to eat.

But perennials should also be a regular part of our diet!

Source: Martin Crawford

Perennial vegetables

Perennial vegetables can be compared to wild plants.

Wild plants are richer in minerals and vitamins, because they have not been selected (they have not changed genetically to improve size, colors, taste, other characteristics). Plus, they grow in healthy, undisturbed soil.

You can create a harvest paradise in your backyard!

Autumn olive bush hanging over a groundcover of ramsons and wild strawberries.

Perennial vegetables

What do they taste like?

- Mild and neutral – musk mallow, plaintain lillies, hops
- Sour – garden sorrel, spinach sorrel, French sorrel
- Sharp – Turkish rocket
- Aromatic, Spicy – ground elder
- Bitter – Good king henry, dandelion
- Anise – sweet cicely, bronze fennel, anise hyssop
- Onions – perennial leeks

Base map

This is our homestead.
Without making a too deep analysis, we have chosen the smallest of available grass lawns, and also, the one that is closest to the house. Following two important permaculture principles: “Start small” and “Relative location”.

Start small

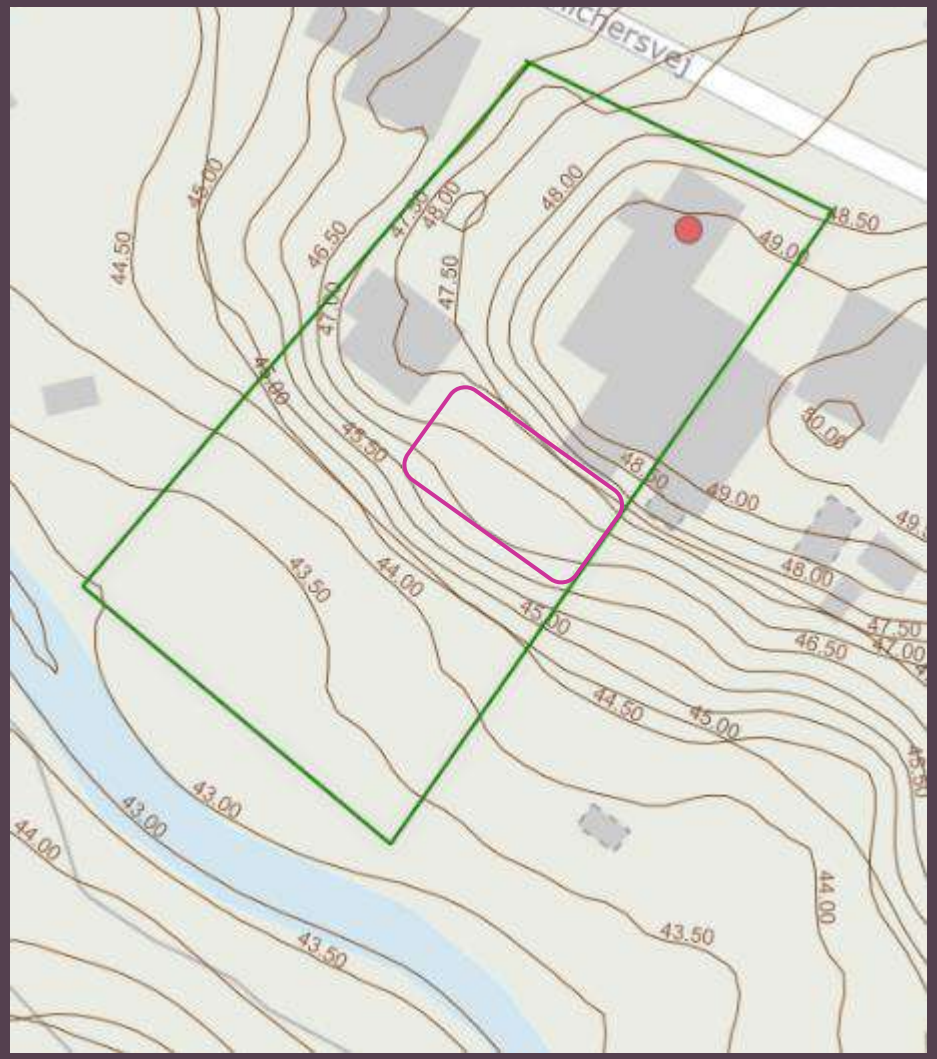
It is very important that your first project is of manageable size. We started with 100 sq. m. It was manageable for the two of us, but starting with a smaller area can be recommended.

Relative location

The forest garden is the place that you visit more or less every day for harvest, so it makes good sense to locate it as close to the house as possible.

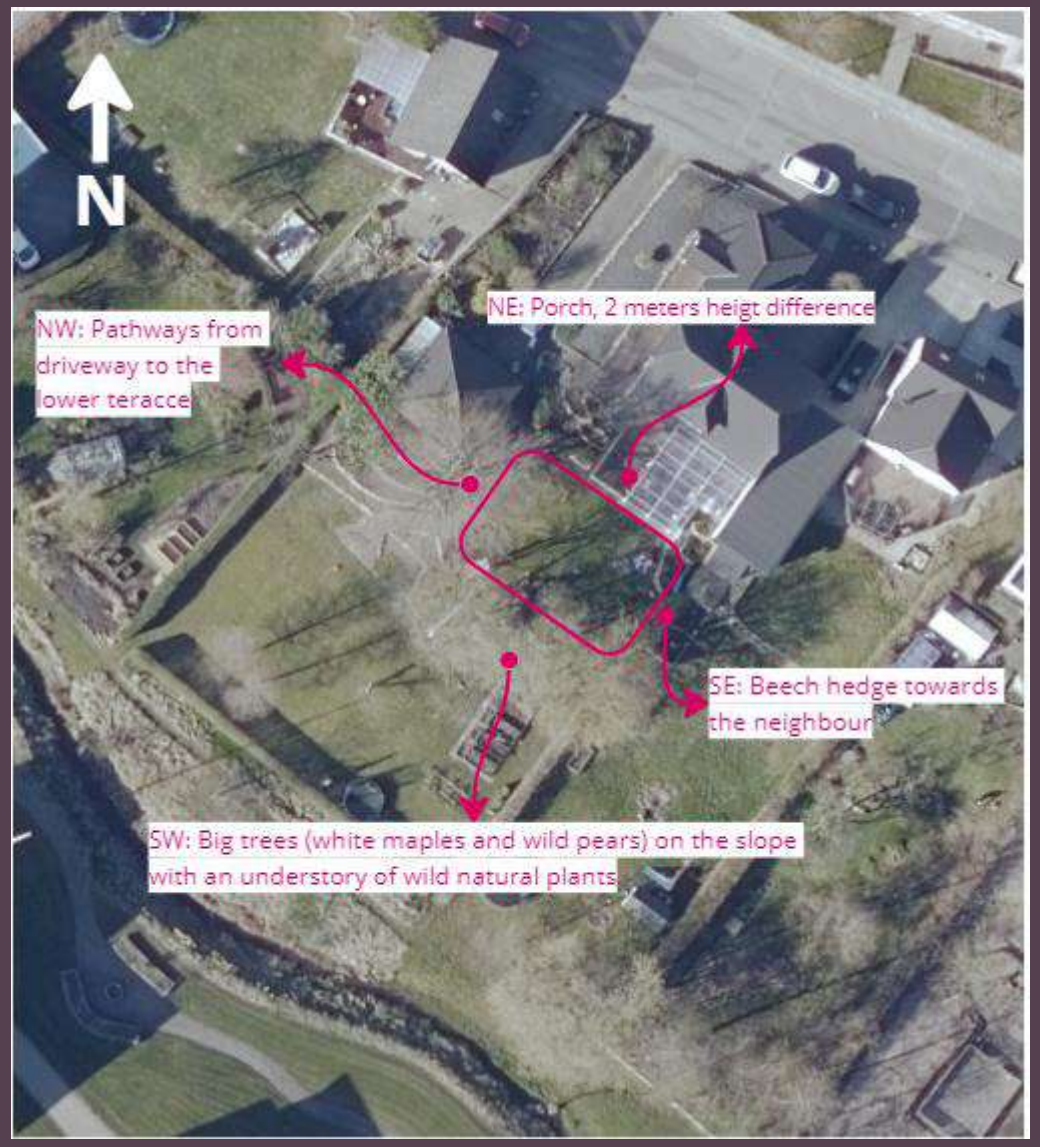
Satelite photo of our homestead, April 2019
Source: sdfikort.dk

Base map – elevation curves



Our place has three terraces:
Top: terrace – the house, middle terrace – driveway and and a small lawn 100 m^2 (selected for the upcoming forrest garden), lower terrace – big lawn 500 m^2.
There is about 2,5 m. height difference between each two terraces.

Base map



Here you can see what is bordering the lawn. Some of these things will have an impact on the design.

Sun

Morning-to-afternoon sun: the whole area gets light

Afternoon-to-evening sun: only upper part gets sun, the rest is in shade from the big trees

Observing the summer sun.

Wind

Strongest wind direction.

Observing the wind

In Denmark our strongest winds come from the west.
In fact we have observed a wind tunnel here.
This presents a boundary or limitation that we will have to deal with later in our design.

Other limitations can be flooding risks, wildlife, e.g., deers visiting, or fire; all depending of where in the world you are. I have heard of hyppos in Africa coming out and tramping the site. In our case the wind is the biggest limiting factor, as we get plenty of rain and very mild winters.

Analysis

Wind protection solutions
Grass lawn transformation methods
Plants “have – want” analysis
Final thoughts

Wind protection

One of the first things to address is to analyse how we can protect the area from the wind.
The below table analyses three options based on their functions

Type	Pluses	Minuses
Hedge (e.g. hazel nut or autumn olive)	- Natural habitat for insects - Could fix nitrogen - Leaves as mulch material - Berries	- Slow to establish, min 3 years - Investment into plants
Hedgerow fence	- Place to utilize branches (everything recycles in the garden) - Natural habitat for insects and birds - Fast to establish - Can support climbers - No or minor investment	
Fence	- Fast to establish - Can support climbers	- Costly

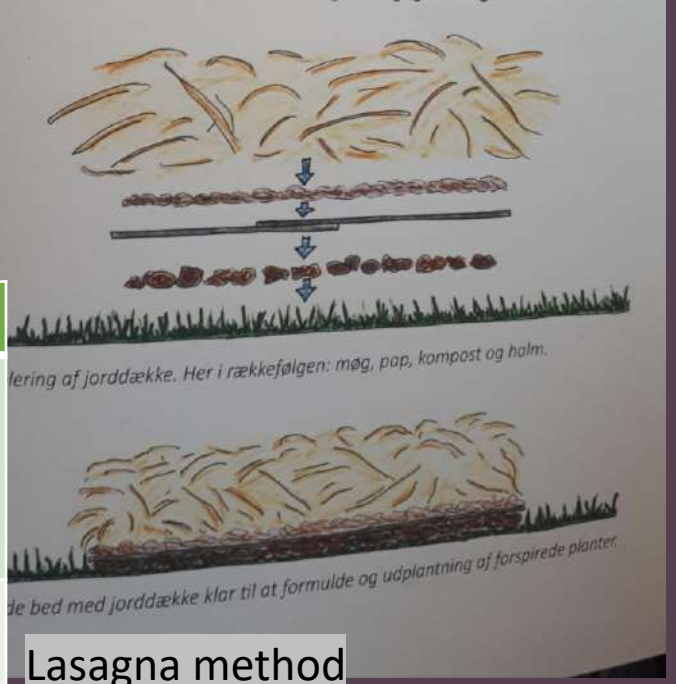

Hedgerow fence

The second option is the most attractive, following the permaculture principle “One element support many functions”.

Grass lawn transformation methods

There are several no-dig methods how transform a grass lawn:

Type	Method	Resource intensive	Agressive weeds' surpression	Time to start planting	Other	Decision
Potatoes & straws	- On the grass 5 cm manure - Potatoes - 10-15 cm straws	***	- Medium	- 5-7 months - Has to be started in April/May, ready to be used in Aug-Oct.	- Gives additional yield: potato harvest - Has to be started in April/May, ready to be used in Aug-Oct.	- Since I was eager to start, this method didn't fit us, since it required waiting one more year.
Lasagna method	- On the grass 5 cm manure - Overlapping cardboard - 15-20 cm compost soil from landfill - 10-15 cm straws	***	Good at suppressing aggressive weeds.	Very fast – you can plant straight away.		- The most appealing. The lawn has mostly grass and moss, no problematic weeds. Allows starting straight away.
Plastic	- Dark plastic on the ground for two years	**	- Medium - Doesn't take the strongest weeds.	- 1-2 years		- Waiting time too long.
Chicken & straws	- lots of straw material and chickens walking in the area for a year or two	*	- Best at suppressing aggressive weeds	- 1-2 years	- Gives the highest quaility soil, I've heard. No weeds and well fertilized.	- Would love to try it out but we don't have chickens, and two long time to wait.



Lasagna method
Source: "Permakulturhaven", Tycho Holcomb and Karoline Nolsø Åen

Plants have-want analysis

Function	Have	Want
Edible: Perennial Vegies	Nettles, Ground elder, Dandelions, Yellow archangel, Rhubarb, Hop, Hosta, Orpine, Iceplant, Chives, Ramsons, Solomon's seal, Garlic, Dandelions	Turkish rocket, Black salsify, Egyptian onions, Bell flowers, Sorrels, Good King Henry, Mallows, Garlic, Babington's leeks, Sweet cicely, Bladder campion, Daylillies, Perennial Kale, Bronze Fennel
Edible: Berries	Currants, raspberries, blueberries.	Honeyberries, japanese wineberies, minikiwis, tayberries, gooseberries, autumn olive
Ground covers	Ground ivy, Yellow archangel, wild strawberries, Bistort	Siberian purslane, Sweet woodruff
Climbers	Hops, Blackberries	Minikiwis, Japanese wineberries, Caucasian spinach

I was amazed how many useful plants I had in advance!

Final thoughts

A few considerations prior to the design:

- Taken that the area is rather small and has a bordering line with big trees (6-8 m.) that provide enough shade, it would not make sense to include additional tall trees within the area. That means we are likely to focus on berry and perennial veg production in this area, rather than fruits and nuts.

- How big should the beds be? Dave Jacke says they should be big enough to have largest diversity possible but small enough to allow harvest without stepping and pressing the soil too much.

- Order vs. diversity consideration. Various sources recommend starting with a few species per one bed. That way it is more controlled, e.g., one ground cover per bed. And once you gain experience, you can let go of control and move towards crazy nature-like blends that are constantly in movement and development.

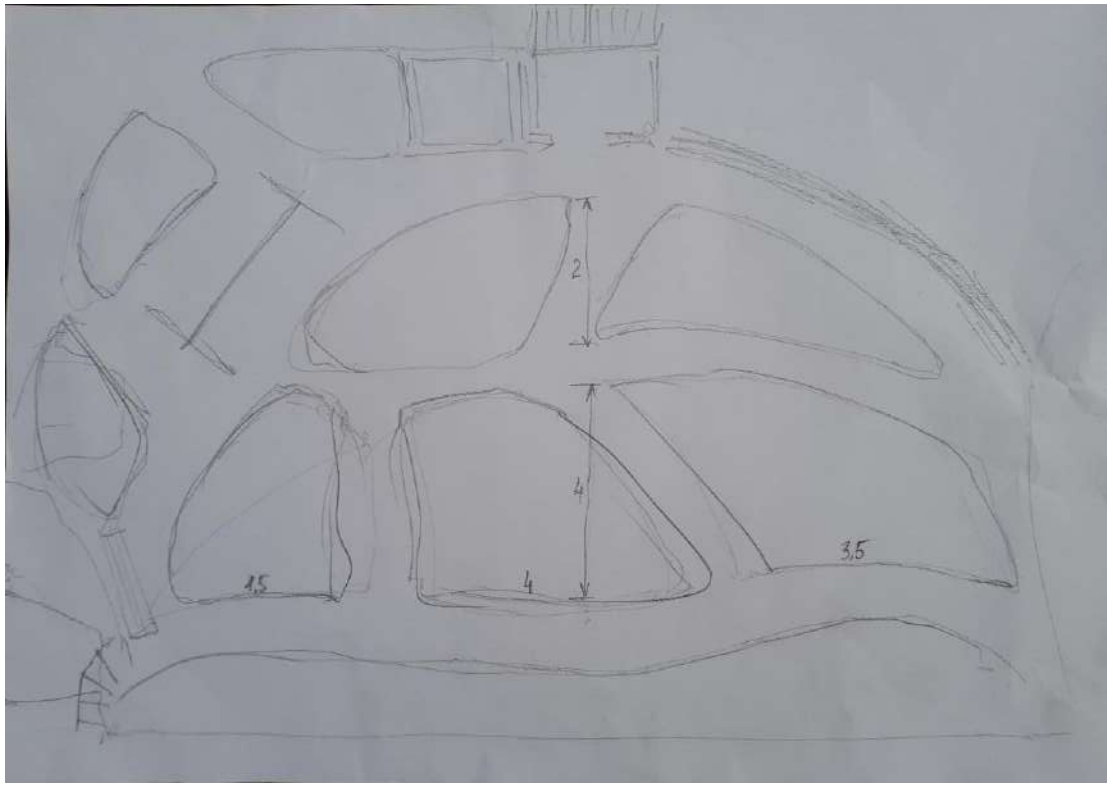
Mixed groundcover of sweet woodruff, wild strawberries, and yellow archangel

Design

Pathway Design
Vegetation layers Design
Plant guild design
Design for vertical growth

Pathway Design

The way you normally do design is that you draw first and then replicate it in reality. That was not the way I did it. To find an overall pattern I took the lawn mower and waited for the grass to grow a bit. Then I tried to find the natural flow for paths: how would I like to move around the area? And then I tried to feel the space, how much can I reach from the path, can I reach far enough without stepping into the bed. I was super excited about my method, but my teachers were not so thrilled. ☺



Once I had decided on the pattern, I asked Boris to draw it for me. However, I did not use this drawing at all while I was designing the garden. I will use it now for illustration and explanation purposes. But my point is that you can design (at least for yourself) without being able to draw (again I am afraid I'll be heavily criticized). But yes, it is possible.

Vegetation layers Design

Layer name	Height	Selected plants to start with
Canopy	8+ m	Existing tall trees on the SW border
Low tree	4-8 m	This layer will be skipped due to small area
Tall shrub	3-4 m	Autumn olive, Lind, Szechuan pepper
Low shrub	1,5-2 m	Blueberries, Honeyberries, Gooseberries, Currants (white, red currant, black)
Herb	0,5-1,5 m	Rhubarb, Hostas, Turkish rocket, Black salsify, Chives, Egyptian onions, Bell flowers, Ramsons, Viola, Solomon's seal, Sorrels, Good King Henry, Ice plants, Mallows, Garlic, Babington's leeks, Sweet cicely, Dandelions
Groundcovers	0,1-0,3 m	Yellow archangel, Ground ivy, Wild strawberries, Bistort, Siberian purslane
Climbers	2+ m	Mini-kiwis, Hop, Caucasian spinach, Japanese wineberries, Blackberries
Tubers	<0 m	This layer will be skipped as we do not want to harvest tubers in the forest garden

For the purpose of this design the following classification of vegetation layers is used. The adaptation compared to the more widespread ones is:

- the heights (e.g. the overstory of 15+ m. is not relevant for us) and
- the destinction between tall and low shrubs which is very useful, in my opinion.

This five layers will be established

Design

Functions*	Plants
Nitrogen fixers	Aautumn olive, Comfreys
Dynamic accumulators	Plantago, Pulmonarias, Dandelions,
Pollinators	Merian, Malva, all the berry shrubs, ground ivy, comfreys, alliums
Pest repellers	Merian, Sage, Thyme, Monarda

*other than edibles

Bumblebee covered in pink malva pollen

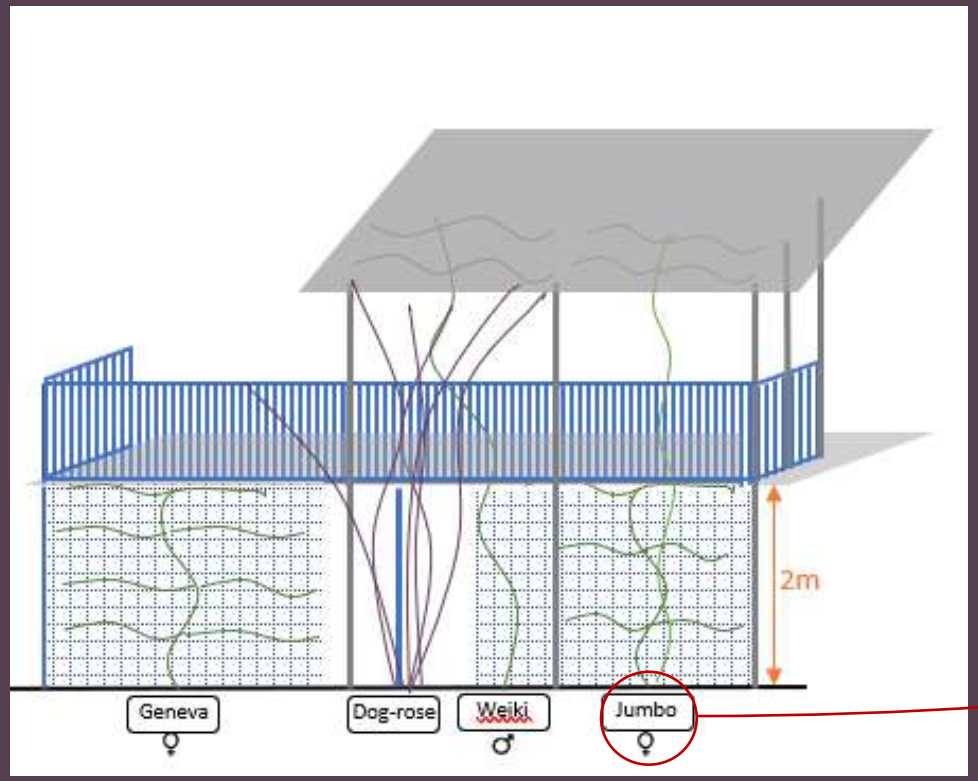
Design

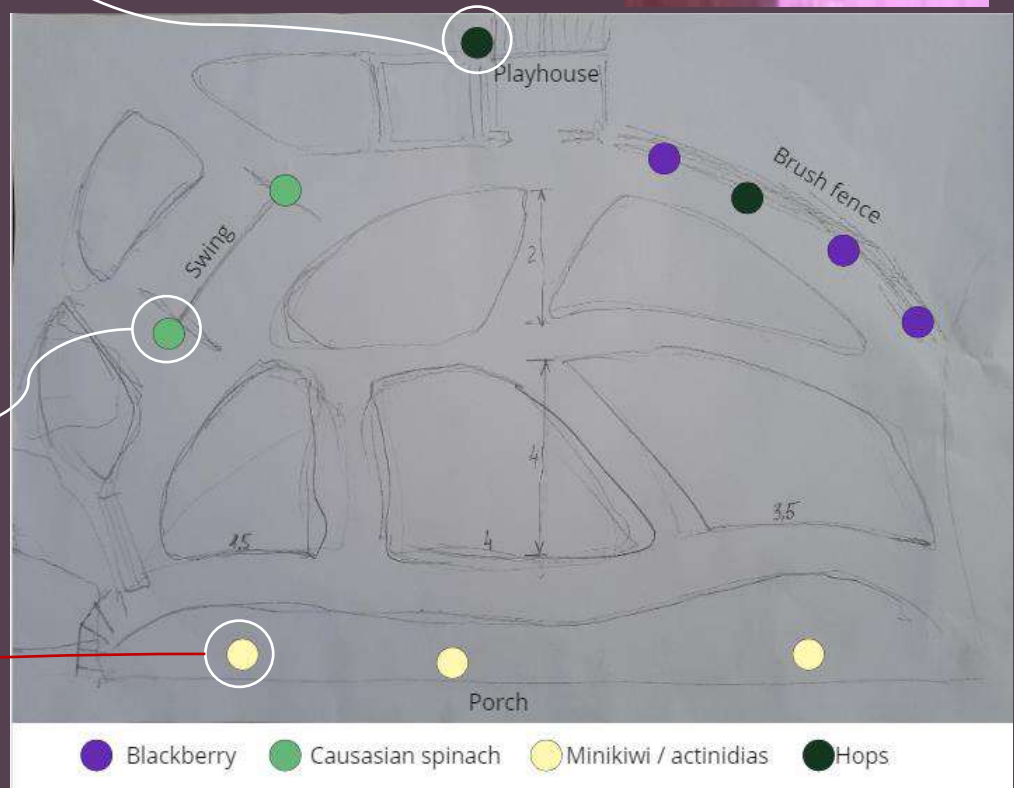
Having decided the overall pattern of the area along with vegetation layers and what plants I want to introduce, it was a mix and match exercise to design each individual bed, following key pattern of combining all four layers in one bed: tall shrub in the middle, low shrubs and herbs around and the ground covers.

Design for vertical growth

Climbers require support for vertical growth:

Hedgerow fence to support blackberries and hop
Playhouse wall for hop
Swings for caucasian spinach
Porch for mini-kiwis





Implementation

I was very worried where do we find all the materials.
But it wasn't that difficult at all:

- Cardboard → Furniture or Bicycle shops → free
- Sheep manure → local farmer → free
- Compost soil → landfill → free
- Woodchips → Local business that cuts bushes and trees, the woodchip is a waste for them that they drive to the landfill → free
- Straws → local biodynamic farmer → 25 dkk per strawbale (cheap)

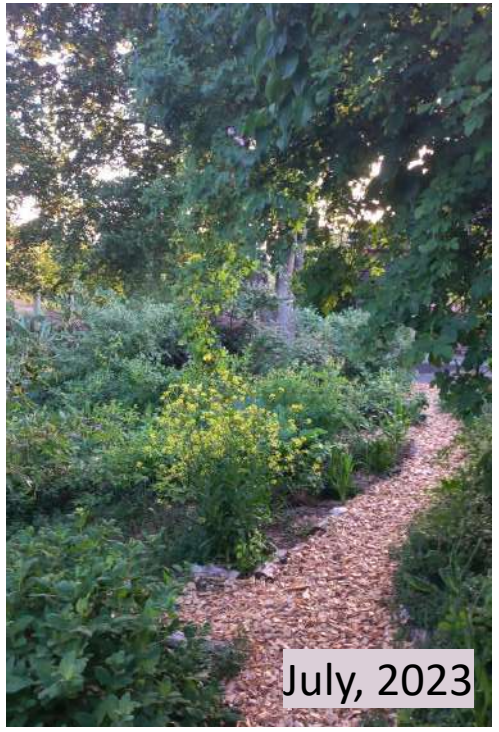
Maintainence

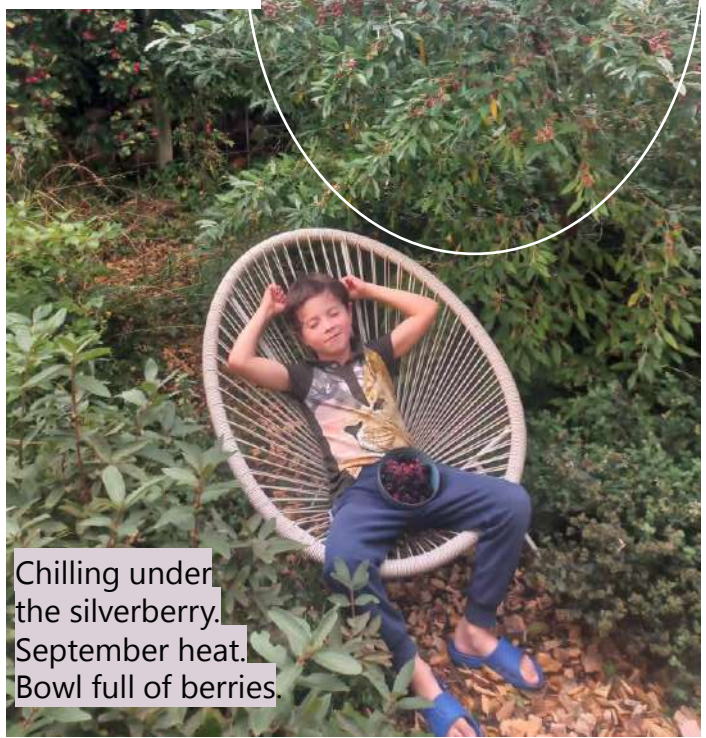
- The first 2-3 years: add mulch until ground covers are established.
- The first 2-3 years: add as much organic material as possible.
- Every spring: add woodchips on paths until paths are established.
- End of April: check for and remove unwanted growth: seedlings (self-seeded wild pear, beech, a-corns, and hazelnuts, dog-rose), ground elder, any other runners.
- In February and/or November: cut back – minikiwis, linden, autumn olives, blackberries)

Luxury of cutting back exponential growth, November 2023

Monitoring

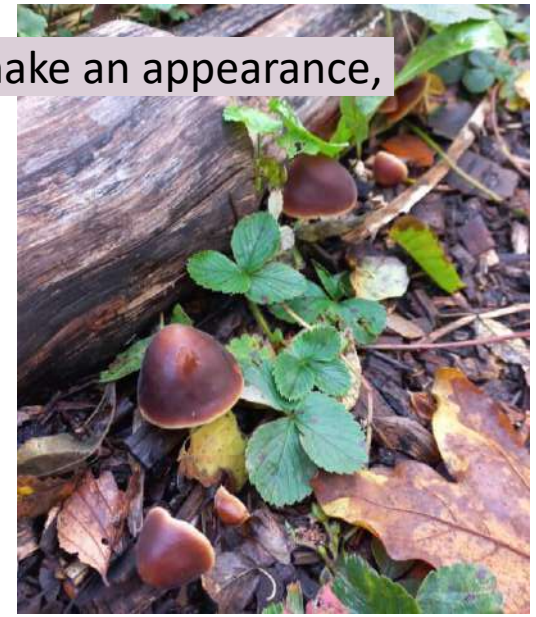
Same autumn olive bush





Monitoring

Mushrooms make an appearance, October 2022



Evaluation of self-sufficiency goals

Prolonged berry season: honey berries in May to minikiwis in November, 2022

From March to November

Perennial vegetables abundance, 2021

Berries in season, 2021

Evaluation: Get more knowledge and practical experience

Garden becomes a learning space: have not only increased own knowledge but ready to pass it on. Even more people care and fair share.

Educational garden tour, April 2023

Harvesting and tasting perennial vegetables

Reflection

It is super interesting to reflect on the first design. This was a design where I was eager to start. Not caring so much about ethics, principles or tools. Luckily, when you design a forest garden naturally you apply ethics, principles and tools.

This was a land-based design without an explicit base map and design map, where the design was happening literally in the field through observing, feeling, thinking and trying. I think it is an ok method that can work for smaller areas and for people without other design experience. For bigger areas I would not do that. In my next design, where we convert 500 m^2 grasslawn into a fruit orchard I have used a decent amount of time on designing on paper first.

The principles that gave me the boost of inspiration were:

- obtain a yield – we HARVEST so much!!!
- value diversity – MAGIC!!!
- one element, many functions – So SMART!!

Siberian purslane, great edible and groundcover plant

Golden keys

When making your first forest garden:

- Start small!!! Size-wise and variety-wise.
- Remember, habits are hard to change, start tasting new perennial vegetables gradually, give yourself time.
- Find a good routine. This video helped take it to the next level the use of forest garden produce.
- Great ressource - Pfaf.org
- Be sure what you are eating

Permaculture Food Forest - Eat Your Weeds, April Harvest + List in Description

372 views • 1 year ago

Inspiratoriet

Last day of April :) We harvest some of the **weeds** that we **eat** regularly from the garden. Please always check that you know what ...

Gratitude

This design was entirely inspired and enabled by **Tycho, Karoline and Cathrine**:
- Their PDC course
- Several visits to Myrrhis forest garden
- Most of the plants came from the Myrrhis plant nursery aswell
- Permaculture toolbox that Cathrine developped
- Tycho and Karolines first and second books

Deep gratitude also to Cecil Rye Olsen and her great youtube channel that helped me introduce so many more weeds into our diet.

Thank you to Lise and Trine, my diploma guild, with whom we exchanged plants and ideas back and forth.