

# Plants and planting designs for organic poultry ranges



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The project is supported by the Danish Fund for organic farming and the EU Rural Development Program.



# Introduction

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Some organic poultry ranges look almost desert-like and, upon entering them, it is not biological diversity one meets. This booklet is our contribution to increasing job satisfaction of the poultry farmer and to increasing the positive image of organic poultry production for consumers and society as a whole. We also hope it can give poultry producers the desire to open up their farms, for example, in connection with a local agricultural event.

How it looks from the hens' point of view, we can only try to understand, but if you look at how much the birds use the range, there is a big difference between farms. What we do know is that a range containing a high diversity of plants can certainly help encourage more birds outdoors and for longer, as well as providing a diversity of food options for them and better returns for the farmer. At the same time, the plants can help to reduce nutrient leaching and to better utilise both the available nutrients and the available space in the range for production.



This booklet on plants and planting in organic poultry ranges is made in the hope that more farmers will be encouraged to create greener, more attractive and more productive poultry farms. The booklet is produced as part of the Danish project “Better utilisation of resources in organic poultry production” which has been created from ideas and inspiration from the Poultry Committee of the Organic National Association.

The booklet has been created through a collaboration between Carsten Markussen, Niels Finn Johansen, Jan Volmar, Ingeborg Holm and Jens Thejsen. Collectively, we have visited many organic poultry farms, some with green ranges and some with very ‘grey’ ranges. These visits have given us ideas and inspiration for some of the schemes contained in the booklet which have been put into practice on Ingeborg Holm’s farm so that there are concrete examples to refer to. All of the planting designs contained in the booklet are tried and tested though not necessarily on poultry farms.

***Note: This booklet has been translated from Danish to English by Dr. Lindsay Whistance. For the information to be relevant to UK poultry farmers some of the text has been modified, e.g., the UK status of trees and shrubs that are named in plant lists is reported.***

# Aims

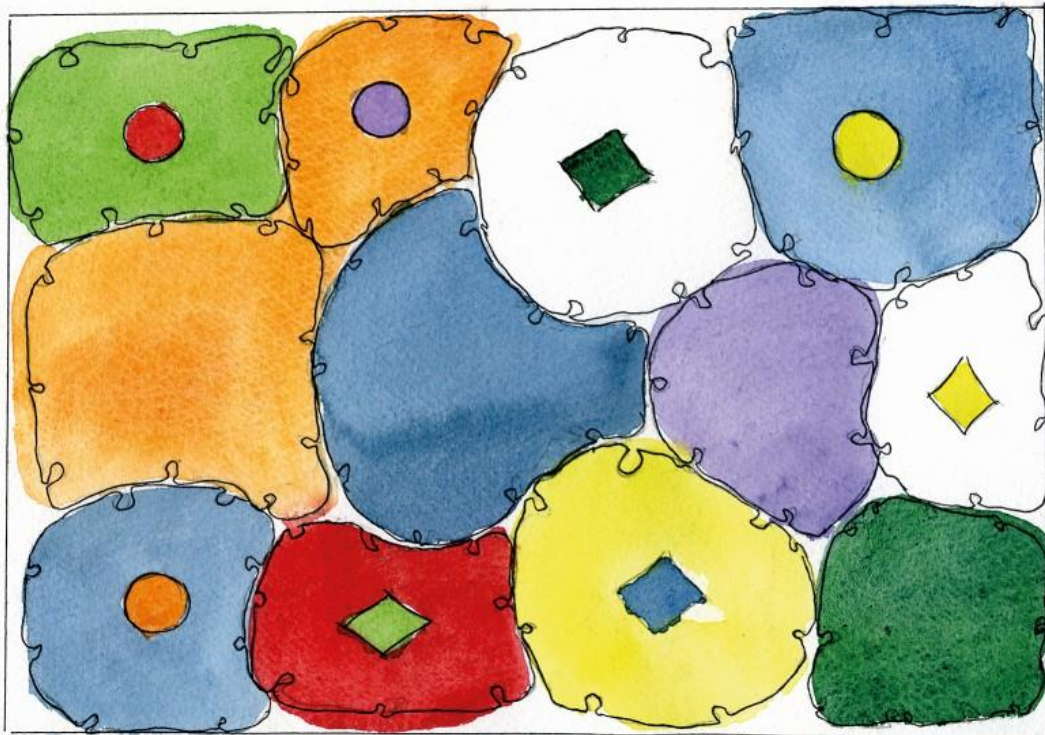
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This part of the project "Better use of resources in organic poultry production" is a proposal for the planting up of organic poultry systems.

## GOALS:

- That the birds must increase their use of the range.
- That the poultry farm increases its aesthetic value.
- That the poultry farm better represents organic farming systems for customers.
- That there will be greater biodiversity on the farm.
- That the plants used can help prevent nutrient leaching.
- To provide a range of options for planting designs

In the following, three planting designs are described namely mosaic planting, modular planting and row planting. There is also an example of a pathway system for farms with multiple flocks and ranges on adjacent land.



Mosaic plantations consist of species-specific groups of different sizes and shapes. The groups are placed close to each other and may overlap. This offers very different light and wind conditions throughout the range as well as offering a foundation for high biodiversity.

# Mosaic planting

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Mosaic planting is a method inspired by nature. In a mosaic planting scheme, plants are introduced as blocks of species-groups which are shaped as irregular mosaic tiles. In this scheme, there is no weed control exercised other than that which the poultry themselves do. Over time, a mosaic planting scheme can provide great biodiversity with a rich and varied insect fauna. The re-wilding nature of this approach can be off-putting for some but if increasing biodiversity is a goal then mosaic planting is highly effective.

## **COURSE OF ACTION**

Plant the species groups in irregular shaped blocks, or 'islands' of at least 4 m<sup>2</sup> and up to a good 30 m<sup>2</sup>. The islands may touch and even overlap a little however, they must also be planted in such a way that the range doesn't get too overgrown so making room for clearings and pathways is also important. The best and simplest way to create the species islands is to not plant in rows but to greatly vary plant spacings in a completely asymmetrical way.

## **DIVERSITY AND HIDING PLACES**

This planting scheme mirrors the mosaics of plant groups found in nature. In unmanaged, natural areas that are fairly balanced, the plants will always group as a patchwork of species and such a vegetation pattern provides the greatest biodiversity. In the species islands, individual plant species can develop and thrive within their own species group along with their associated fauna of insects, etc. A mosaic planting scheme will also provide good opportunities for shade and shelter for birds due to the very different canopy cover that arises where the species islands meet in between the more open areas without bushes and trees.

## **AREAS BETWEEN SPECIES ISLANDS**

Within the mosaic planting scheme, grasses and herbs can be sown between the species islands or ground cover vegetation can be left to come by itself. Greater control is exercised through sowing grass and herbs between the islands. These areas can either be mown a couple of times a year or the birds themselves can be used to keep vegetation under control. If the birds are used to manage the vegetation note that there is likely to be more bare ground closer to their housing while the furthest parts of their range may become overgrown.



A mosaic of different trees and shrubs. An optimal mix of tree and shrub species includes an extended season of flowers and fruits.

# Modular Planting

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Modular planting is also based on natural mosaic growth patterns but is of a more systematic planting design than the mosaic planting scheme previously described. This design is easier to manage than mosaic planting.

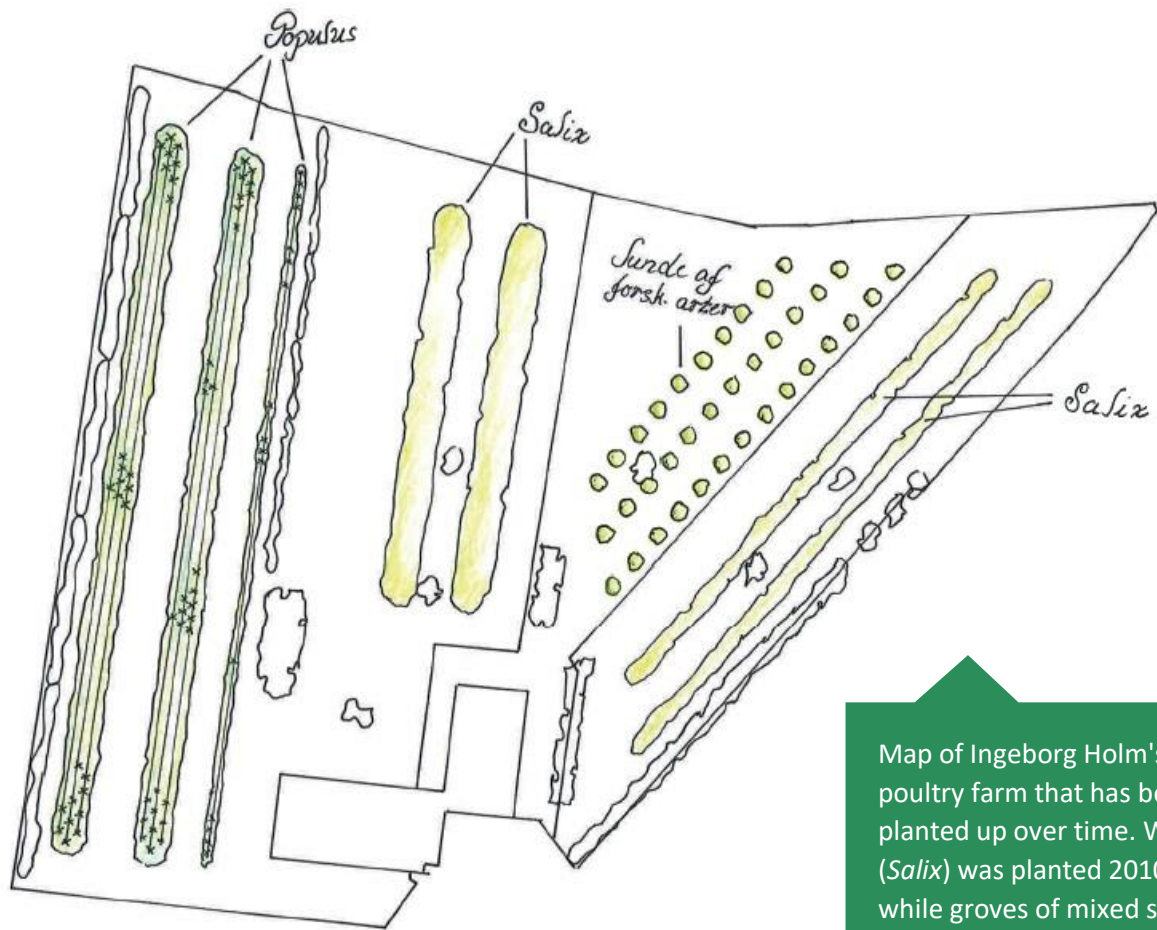
Modular planting is a way of planting ranges that will be appropriate for many poultry businesses since the method can be used both for multiple ranges based on the same farm (multiple flock systems) or for a single range. Modular planting can be used in all types of ranges e.g., narrow, long or wide ranges. However, the modular system should not be perceived as a system that can be copied 'as is' and it must be adapted to specific, local conditions.

Several farms already work with willow plantations in the ranges. This is partly because the willow grows quickly and partly because most varieties of willow efficiently collect nutrients excreted by the birds. Modular planting need not be considered as an alternative to willow plantations since it can be used alongside as a supplementary planting scheme. The following is a proposal for a planting design that shares common goals with willow plantations, but also offers further benefits.

Modular planting can be established in a single range with the remaining areas left as willow plantations or other row-planting systems. You can, of course, also have all the ranges on farms as modular plantations.

In the following, three different modular planting systems are described.





Map of Ingeborg Holm's poultry farm that has been planted up over time. Willow (*Salix*) was planted 2010-11 while groves of mixed species and poplar (*Populus*) were planted in 2012. There are also older shelterbelts and groves in the range.

### Row Planting

Row planting is the traditional way of planting, e.g., forest, biofuel plantations and hedges. It's simple and straightforward. Often, a single variety is planted and, in some cases, a single cultivar. On poultry farms in Denmark, a single willow species or a poplar species has typically been used.

Where there are multiple poultry ranges on the same farm, you can advantageously include several types of planting designs. It can be both practical, cheap and easy to combine mosaic planting or modular planting with a regular row planting system. Here, a poplar plantation has been chosen.

Most plantations in Denmark typically grow only one cultivar (OP42), but this can increase its vulnerability and so it is proposed to plant at least three different cultivars e.g.: *Populus trichocarpa* "OP42", *Populus trichocarpa* "Poca" and *Populus trichocarpa* "Mühle Larsen". Restrict your choice of cultivars to those that tolerate regional conditions, for example, use only cultivars that can tolerate winter conditions. Note that this suggested plant mix does not, in itself, offer any great biodiversity, however, it does offer a greater certainty of longer-term stability.

### Pathway system

Natural pathways can be established through many types of poultry ranges, through



row plantations, modular systems and genuine mosaic planting. A pathway system through the poultry range can enable farm visitors and customers to get closer to the birds whilst minimising unnecessary disturbance. At the same time, a pathway system can both increase the aesthetics and biodiversity of the poultry range.

By using the pathway system, customers and other visitors can experience an attractive walk through biodiverse ranges and, at the same time, evaluate the birds' environment and observe the behaviour of organic poultry.

The pathway system was developed from an idea of Ingeborg Holm's and was designed specifically to work in her poultry ranges however the plant selection and the pathway plans can be adapted for use in different poultry range systems.

### **Plan**

To illustrate the pathway system, begin with a drawn plan to show how a pathway can be created, utilising any existing trees and shrubs. This enables you to see how to create a path with soft lines whilst, at the same time, maintaining good visual access to the birds. A more convoluted pathway will not fulfil its purpose and will appear more artificial. The same is true of a more geometric pathway system built on straight lines.

## **Modular planting in poultry ranges - detailed description**

### **PURPOSE**

The purpose of the modular planting system is:

- to develop a planting system that can be used in several ranges with different lengths and widths.
- to ensure that the plants used are suitable for local soil types and weather conditions. Extreme conditions like cold wet soils are, of course, exceptions.

The planting system itself must also:

- create an enriched range environment.
- improve the visual aesthetics of the range.
- create high biodiversity both in the range and on the farm as a whole.
- prevent the leaching of nutrients.

### **PLANT SELECTION**

1. Choose plants that can cope with the alkaline soil in the range, where the pH is often high.
2. The trees and shrubs used should be primarily native or naturalised species to provide the greatest biodiversity.
3. The species included in the planting scheme should be positioned with regard to their height, width and light requirements, etc.
4. Some plants have been selected which are fruit bearing, not only so that the poultry can forage amongst them and eat some, but also because they offer good biodiversity with many insects and, at the same time, are visually attractive. If you want to harvest any fruit, some of the native fruiting plants can be replaced with fruiting varieties of trees and bushes. For example, eating apple instead of wild apple or sweet cherry instead of bird cherry.
5. The chosen species offer good protection for the flock and the system can develop with minimal or no pruning.
6. The chosen species have an open growth form so the birds can freely move amongst them.



If the trees on the range are intended for dual purpose, such as cultivation of willow / poplar for energy or an orchard, the species diversity becomes naturally smaller and the range may also be less attractive for the flock.

### THE PLANT LIST - MODULAR PLANTING

The plant list shows which plants should be used and in what quantities. In the plant list, both the common name and Latin name have been included. The Latin names have been included to ensure that the correct plants are ordered from the tree nursery. Only common names are used in the remaining text.



The plants on the list have been ranked according to the importance of their inclusion. This does not mean that plants with a lower score should be excluded but, when ordering in the plants, most of the plants with three stars should be included to optimise biodiversity. Nevertheless, it is important that as many of the species as possible are represented.

The greatest biodiversity is achieved when larger groups of single species are established with individual plants of a different species interspersed amongst them. This provides the most versatile structure, offering a variety of light, shade, wind and shelter.

(N): native (Na): naturalised

Priority ranking:

- High
- Medium
- Low

#### TREES

##### QUINCE - CYDONIA OBLONGA •

Small tree or large shrub that blooms in May with large white to light pink blossom. A very good pollinator plant. In September-October it has large apple or pear-shaped fruits that can be used in cooking or to provide a good winter food source for poultry and other birds.

##### ALDER BUCKTHORN - RHAMNUS FRANGULA (N) ••

Small tree or large shrub. Flowers from the end of May through to October with very small flowers which provide a good source of nectar for bees. Produces black fruit that are an attractive feed for birds.

##### CHERRY PLUM - PRUNUS CERASIFERA (Nat) •

Larger tree that blooms from the end April to early May. Yellow or red edible fruits.

##### ROWAN/MOUNTAIN ASH - SORBUS AUCUPARIA (N) ••

Small tree that blooms in May with white umbel-like heads. Orange fruits.

##### CRAB APPLE - MALUS SYLVESTRIS (N) •••

Smaller tree that blooms May-June.

##### BIRD CHERRY - PRUNUS PADUS (N) •

Medium-sized tree, which blooms in May with scented

small, whitish flowers in clusters. Small, black fruits.

**MIDLAND HAWTHORN - CRATAEGUS LAEVIGATA (N) •**

The tree is 4-7 m high with red berries (haws).

**WILD CHERRY - PRUNUS AVIUM (N) •**

Grows to 12-15 m high with reddish cherries.

**COMMON PEAR - PYRUS COMMUNIS (Nat) ••**

Medium to large tree with white blossom in May. As it matures, it produces many small pears.

**MAHALEB CHERRY - PRUNUS MAHALEB (Nat) •**

Small tree with prolific flowering in May-June. Small white flowers and black fruits.

**BUSHES**

**ELDER - SAMBUCUS NIGRA (N) •••**

Large shrub / tree that blooms in July with whitish flowers and black fruits.

**RED-BERRIED ELDER - SAMBUCUS RACEMOSA (N) •**

Tall shrub that blooms in April-May with yellow-green flowers in clusters. Bears red fruit.

**RED CURRANT - RIBES RUBRUM (N) ••**

1-1.5 m tall shrub with small flowers in clusters and with red / whitish fruits.

**ALPINE CURRANT - RIBES ALPINUM (N) ••**

Medium tall shrub. Has very early leaves. Small flowers in April.

**SPINDLE - EUONYMUS EUROPAEUS (N) ••**

A medium-high shrub that blooms with yellow-green flowers in spring and has seed heads with visible orange seeds.

**GUELDER ROSE - VIBURNUM OPULUS (N) •••**

A medium-high shrub with white flowers in July and with red fruits that remain on the plant long into the winter.

**GLAUCCOUS DOG ROSE - ROSA DUMALIS (N) •**

1-2 m high. Flowers in May-June with white to

pink flowers. Red, elongated tapered hips.

**SWEET BRIAR - ROSA RUBIGINOSA (N) •**

1.5-2.5 m high. Blossoms in May-June with pink flowers and has elongated hips.

**MODULAR PLANTING TYPES**

Three modular planting types are described. Select the same types of plants for the three modular systems.

A. Is a traditional modular type planting scheme with straight rows and the same distance between each row, here 1.5 m.

B. A fan-shaped design with increasingly greater distance between each row.

C. A simple modular system with larger groups or groves with a higher density of plants and with larger open, grassed areas.

**A. The traditional modular planting**

This planting method consists of straight rows which can easily be traversed. The row spacing is, for example, 1.5 m or whatever is most practical. Within the rows, planting density can be varied. Here, a varied plant spacing is chosen to create different light and shade conditions.

**Planting**

Many different species of trees and shrubs are planted that will develop differently, and therefore it is possible to obtain a more natural, organic expression, even when they are grown in rows. The more natural effect is increased with a variety of plant spacings, from 75 cm to 200 cm, within each row. In some places, the row will be similar to an uncut hedge, where elsewhere it will be more open. The varied plant spacing can be a little more difficult to work with if you are used to uniform planting distances.

However, any problems are largely to do with convention and determining the initial spacings of the plants.

### **Group planting**

It is very important to create a plan for the design and not to plant randomly. Plants should, for the most part, be placed in groups of the same species and these plant groves should be placed within more open areas. A mosaic-like system provides the greatest biodiversity. Simultaneously, it increases the likelihood of successful plant establishment, and it matters less if some plants fail.

This proposal uses 11 species in 12 groves with the same plant selection and the same distribution as illustrated on page 14, shown as a 3 x 4 grove design repeated once in the same block so that there are 3 x 8 groves.

One can e.g. create groups with each containing 25 plants of the same species, distributed in five rows.

You can start with: guelder rose followed by crab apple, elder, bird cherry, Mahaleb cherry, re-berried elder, alpine currant, common pear, rowan, wild cherry and repeat beginning with guelder rose.

The next rows can start with crab apple followed by elder, bird cherry, Mahaleb cherry, red-berried elder, alpine currant, common pear, rowan, elder, wild cherry, quince, guelder rose and repeat beginning with crab apple. Great diversity in the size and density of the plant groups can be created by having different plant spacings. Some groups may have planting distances of 200 cm, others of 75 cm. There can also be different plant spacings within a group.

### **B. Fan-shaped modular planting**

In the fan-shaped modular planting scheme, exactly the same plant scheme can be used as in the traditional modular planting scheme. And, of course, you can use exactly the same plant species but the effect will still be very different because the row spacings change from one end of the range to the other.

Starting your planting in the middle of one end of the range will create the finest fan.

The fan shape will create increasing levels of light in the rows without them being totally open, encouraging the birds to move further into the range. At the same time, there will also be varied plant spacings within the rows and this dynamic planting will provide the birds with opportunities to hide as well as offering escape routes. Within this system, one can create slightly larger open areas that are considered to have a positive influence on the birds and their use of the range.

In addition to the varied light and shade conditions, the fan-shaped modular planting is also highly attractive in aesthetic terms.

This method of planting requires much greater precision and effort in the design and planting phases and is more difficult to manage because of the varying widths between rows.

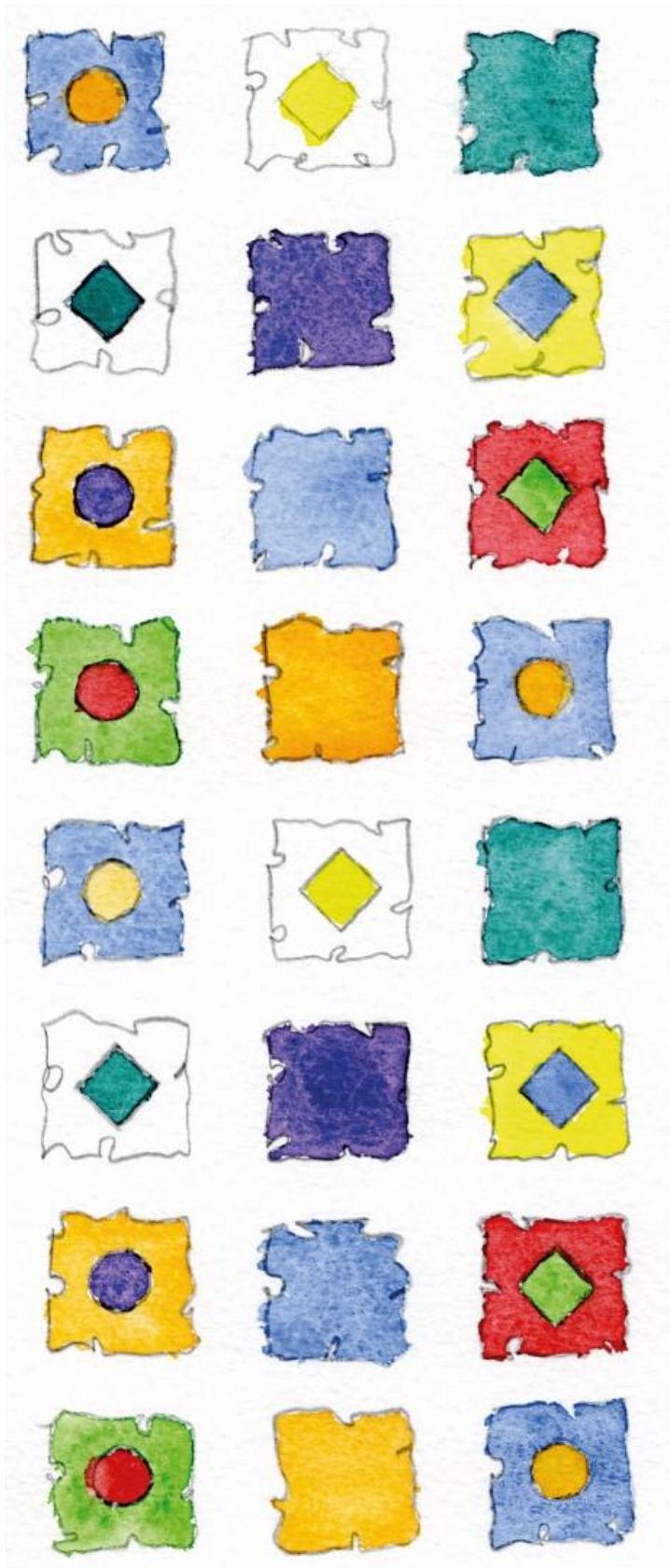
### **C. Simple modular planting**

This is a simplified planting model that is easy to manage, but compromises on the level of biodiversity that can be achieved with group and fan-shaped modular planting.

Here, there are 75 cm alleys between the rows with larger groves (36 m<sup>2</sup>) and larger open spaces of mown pasture. This design is relatively easy to establish and maintain, is richer in nature, more aesthetically pleasing and attractive to the birds compared to unplanted ranges. A grove consists of 37 plants of the same species. Large open spaces are created between the groves with machine access between them. In this way, larger areas of light are created which the birds may find attractive.

#### **Structure**

There are 75 cm between the rows and 1.5 m between the plants within the rows. In this way, the



An example of a modular system consisting of 2 x 12 species groves that are separated. Each single-species grove is repeated twice in this system for their value as important species which offer high biological value.

-  *Elder*
-  *Quince*
-  *Common pear*
-  *Red-berried elder*
-  *Alpine currant*
-  *Wild cherry*
-  *Bird cherry*
-  *Mahaleb cherry*
-  *Rowan*
-  *Guelder rose*
-  *Crab apple*

An example of modular planting in a poultry range.



plants are not over-crowded yet are close enough to encourage and support upward growth. The trees and shrubs are planted in a staggered pattern, as bricks in a wall.

Each grove is  $6 \times 6 \text{ m} = 36 \text{ m}^2$  and contains 37 plants.

After 5-6 years it will be necessary to thin out within the groves.

10 m spacing between the groves is suggested, though this can be varied according to conditions. However, there should always be sufficient access for a tractor. The areas between the groves are sown with grass and, preferably, with several herb species (see the plant list for modular planting).

When the range is ready to be planted, place 37 plants of each chosen species within the areas that are designated groves. In this way, the planting process is completed quickly according to the existing plan.

Each grove consists of one species, but between three to five plants can be replaced with the same number of plants of a different species, e.g., alder buckthorn.

The modular planting scheme consists of 12 groves containing 11 different plant species, with one species in each grove, as seen on page 14. There are two groves with elder, *Sambucus nigra*.

#### **Windbreaks for modular planting systems**

In addition to the groves, a half-open hedgerow should be planted at the outer edge on both sides. The hedgerow should be established as a single row with mixed species planted in a fairly random order. The planting list should include spindle, sweet briar, guelder rose and elder together with any excess plants leftover from the grove planting. A planting distance of 1.5 m is recommended. It's not a real hedgerow, though these rows, together with the groves, help to break up the flow of wind, preventing wind tunnels.

# Pathway systems in poultry ranges

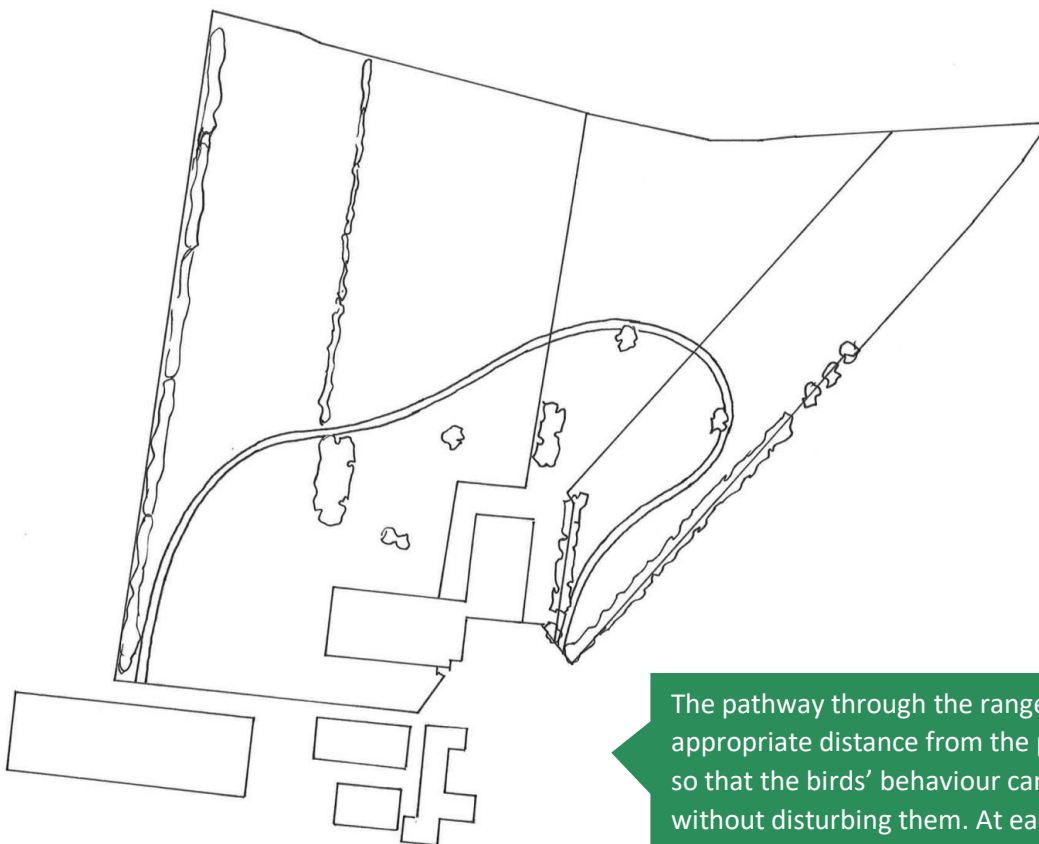
Several of the poultry ranges on Ingeborg Holm's farm are planted with willow. Though there are benefits, it neither offers biodiversity nor an experience of any aesthetic value. However, this can be partially improved with a pathway that crosses through the ranges, which is surrounded by trees and shrubs that are both attractive and have great biological value.

The following is a proposal for building a pathway system through the ranges at Ingeborg Holm's farm. The proposal further builds on Ingeborg's own ideas and thoughts about the pathway. The sketch illustrates the proposed pathway.

## PURPOSE

The pathway through the ranges has several purposes. It must:

- offer a route for customers and other visitors who wish to see how the birds thrive on the farm.
- increase the biological diversity of the ranges and the surrounding landscape.
- be an aesthetic experience.
- provide a good 'nature and culture' experience.



The pathway through the ranges is placed at an appropriate distance from the poultry houses so that the birds' behaviour can be observed without disturbing them. At each end of the path, a porch can be erected containing an information board along with boots or covers for footwear for visitors.



## STRUCTURE

The pathway should pass through all the poultry ranges and be placed at such a distance from the buildings that the birds can be observed without disturbing them. At the same time, the birds must be able to use the trees and shrubs along the pathway as part of their range.

The pathway need not be the same width all the way along but can vary from 1.5 to 2.5 m. No substrate should be laid down to cover the path, it just requires levelling and firming. After the path is created a layer of gravel could be used to mark the route but once the plants are well established, the pathway will be obvious.

In suitable places along the route, where there is shelter and a good view, a group of plants with a bench can be added. There can also be information boards set up explaining e.g., organic egg production as well as information about the plants that are present in the range.

The plants must form a continuous row all along both sides of the pathway. These should be planted partly in single rows, following the path, partly in double rows and also in small groups. This design will help to create dynamism increasing both diversity and the aesthetic experience.

The route of the path is designed to pass by any previously established trees and shrubs already present in the range. These existing planted areas could flank one or both sides of the pathway in some places and in others they could be as islands along the path.

The route of the path is designed to create gentle curves which progress harmoniously through the landscape.

It is important that the path does not consist of straight lines or sharp bends that confuse the overall impression of harmony. The pathway will go through both planted and open areas. In some places, some existing plants may have to be removed, though elsewhere they may be included in the path system.

Most of the species on the planting list are native or naturalised in order to provide the greatest biodiversity. The remaining plants are included as good insect and bird plants. More exotic plant species that tend to become invasive have not been included.

Both trees and shrubs are included and, in some cases, herbs. It is recommended to plant the common species rather than varieties, as varieties can be more or less infertile and, as a rule, do not have as much biological value.

### Height and plant distance

- Low shrubs 0.5-1.25 m:  
Planting distance: 0.75-1m.
- Middle-high shrubs 1.25-1.75 m:  
Planting distance: 1-1.5 m.
- High shrubs over 1.75 m:  
Planting distance 1.5-2 m.

## PLANT LIST FOR PATHWAY SYSTEMS

The plants on the list are species that should thrive along the path. Not all plants can be used in large quantities and some are only chosen to give variation in height and to create space, e.g. Scots pine. The plant list shows which plants should be used and in what quantities. In the plant list, both the common name and Latin name have been included. The Latin names have been included to ensure that the correct plants are ordered from the tree nursery. Only common names are used in the remaining text.

The plants on the list have been ranked according to the importance of their inclusion. This does not mean that plants with a lower score should be excluded but, when ordering in the plants, most of the plants with three stars should be included to optimise biodiversity. Nevertheless, it is important that as many of the species as possible are represented. The greatest biodiversity is achieved when larger groups of single species are established with individual plants of a different species interspersed amongst them. This provides the most versatile structure, offering a variety of light, shade, wind and shelter.

(N): native (Na): naturalised

Priority ranking:

- High
- Medium
- Low

## TREES

### CRAB APPLE - MALUS SYLVESTRIS (N) •••

Smaller tree that blooms May-June.

### ROWAN/MOUNTAIN ASH - SORBUS AUCUPARIA (N) ••

Small tree that blooms in May with white umbel-like heads. Orange fruits.

### BIRD CHERRY - PRUNUS PADUS (N) •

Medium-sized tree, which blooms in May with scented small, whitish flowers in clusters. Small, black fruits.

### COMMON PEAR – PYRUS COMMUNIS (Nat) ••

Medium to large tree with white blossom in May. As it matures, it produces many small pears.

### MAHALEB CHERRY - PRUNUS MAHALEB (Nat) •

Small tree with prolific flowering in May-June. Small white flowers and black fruits.

### SCOTS PINE - PINUS SYLVESTRIS (N) •

A coniferous tree that can grow up to 20 m high.

## SHRUBS

### ELDER - SAMBUCUS NIGRA (N) •••

Tall shrub / tree that blooms in July with whitish flowers and black fruits.

### RED-BERRIED ELDER - SAMBUCUS RACEMOSA (N) •

Tall shrub that blooms in April-May with yellow-green flowers in clusters. Bears red fruit.

### RED CURRANT - RIBES RUBRUM (N) ••

1-1.5 m tall shrub with small flowers in clusters and with red / whitish fruits.

### ALPINE CURRANT - RIBES ALPINUM (N) ••

Medium tall shrub. Has very early leaves. Small flowers in April.

### HAZEL - CORYLUS AVELLANA (N) •

Large shrub that blooms in February-March. Hazelnuts produced in autumn.

### DOGWOOD - CORNUS SANGUINEA (N) ••

High and wide shrub with small white flowers in umbels and with black fruits. Spreads a lot.

### SPINDLE - EUONYMUS EUROPEEUS (N) ••

A medium-high shrub that blooms with yellow-green flowers in spring and has seed heads with visible orange seeds.

### GUELDER ROSE - VIBURNUM OPULUS (N) •••

A medium-high shrub with white flowers in July and with red fruits that remain on the plant long into the winter.

#### GLAUCOUS DOG ROSE - ROSA DUMALIS (N) •

1-2 m high. Flowers in May-June with white to pink flowers. Red, elongated tapered hips.

#### SWEET BRIAR - ROSA RUBIGINOSA (N) •

1.5-2.5 m high. Flowers in May-June with pink flowers and have elongated hips.

#### DOG ROSE - ROSA CANINA (N) •

2-3 m high. Flowers May to June with white to bright pink flowers. Oval hips.

### HERBS

#### COMMON AGRIMONY - AGRIMONIA EUPATORIA (N) •

Tall perennial herb with deep rhizomes. Blooms in June - September with small yellow flowers on a tall spike.

#### BLOODY CRANESBILL - GERANIUM SANGUINE (N) •

30 cm high perennial herb that blooms from June until September.

#### CHICORY - CICHORIUM INTYBUS (N) •

60-90 cm high and with blue flowers July-Sep.

#### COMMON MALLOW - MALVA SYLVESTRIS (N) •

30-100 cm high. Flowering from May to August with pink, hollyhock-like flowers.

Other herbal books and magazines can offer further inspiration on herb planting options.

### PROPOSAL FOR PATHWAY SYSTEM AT INGEBORG'S FARM

#### Pathway layout

The pathway should be made 2.5 m wide however the available width will change as the plants develop. Visitors will enter the range through guelder rose on both sides (or on one side if there are existing plants) and will leave the range through a similar avenue of guelder rose. Therefore, begin and end the planting scheme with guelder rose.

Guelder rose develops into a big shrub that is very attractive when in flower. The white blossom is similar to hydrangea flowers. Later, there are red / orange fruits that remain on the shrub far into the winter.

Then comes a more open stretch of planting with a row of spindle. The better visibility, with greater spacing between the plants, offers a view across the range.

Spindle is a medium-high shrub, with small yellow-green blossom. Later, there are lots of small pink capsules which open up to reveal bright orange seeds. In autumn, the leaves are a beautiful red colour.

The path then continues with single rows of dogwood, which grows into a large shrub, groups of alpine currants, which are small bushes over which the range can be seen, and single rows of rowan which are smaller trees that break the view. The idea is that one should be able to have a general overview of the range, with some plants breaking up the view. This makes the planting more interesting: it creates a windbreak, it offers greater diversity and provides an aesthetic experience.

Dogwood is a wide shrub that develops reddish-brown stems with age. The white flowers are attractive to insects and the black fruits are eaten by birds.

Alpine currant is a medium-low shrub which comes early into leaf ensuring that there is something of interest in the planting scheme from very early spring. At the same time, alpine currant is a robust plant that can withstand the poultry stocking it. It provides good groundcover.

Common mallow is a biennial plant that thrives well in scrub. It develops good ground cover with its over-lapping leaves and bears highly attractive flowers. Later on, it develops seed heads with a mass of small seeds that are good for the birds to pick at.

Rowan, or mountain ash, is a small tree that relatively quickly produces flowers and berries. Only a few of these should be planted to lift the planting along the path and to offer an aesthetic experience for those walking along the path.

Chicory is a biennial plant, which can only be used if there is sufficient light. In shade, it becomes leggy and rangy.

### ***Pathway route through established plantings***

In many existing organic poultry ranges, a new pathway will cut through established plantations. It may therefore be necessary to remove some of this planting.

In willow plantations, an opening can often encourage more life. In some places, parts of the established planting can be replaced with, for example, smaller shrubs to provide visibility. In other places, the effect can be positive if the pathway goes through some of the willow. Other places again can be opened up and planted or sown with the suggested herbs. This might be chicory, which will both enrich the walk along the path and bring some life to a rather barren willow plantation. At the same time, the poultry will without doubt feed on the chicory plants. If there is a little less available light, mallow can be selected and this will enrich the path in the same way as chicory.

If the range has very little greenery, the herbs will soon be eaten after the birds are given access and especially near the hen house.

### ***Pathways through open areas***

After the pathway has moved through the established plantations, there will often be open areas where there is only grass. Here, single rows or clusters of plants can be established along the path. Not wide, dense shrubs, but plants that mark the path and at the same time preserve the view across the ranges. These can be alpine currant, red currant and perhaps some slightly taller shrubs such as the wild roses. A pair of trees can also be included such as crab apple, rowan, common pear, Mahaleb cherry or Scots pine.

If the pathway goes through larger open areas, some small islands can be created. Islands should be built around the pathway so that the lower shrubs are on the same side at the housing and the birds' behaviour can be observed. The slightly higher shrubs can then be placed on the opposite side of the path, away from the buildings.

Examples of low shrubs: currant, spindle and alpine currant interspersed with some wild roses. Higher shrubs can be elder, red-berried elder, dogwood and perhaps hazel.

While the trees and shrubs in the island groups are still small, herbs such as chicory and mallow and perhaps a wild perennial like bloody cranesbill can be sown between them. These plants will protect the young shrubs and trees, but it presupposes that the poultry are kept off the area, while the herbs are established.

### ***Trees along the pathway***

The trees are not to be planted as avenues but rather as small groups in the islands or as single trees scattered between the shrubs that follow the pathway edges. The landscape will be more aesthetically pleasing, the planting plan will be more dynamic, and it will provide variation in light and shade conditions as well as increasing biodiversity.

### **Quality control of the plants**

When the plants arrive on farm, it is important to check that they are the right plants in the right

size, that the root system is healthy and that the plants have not been dried out.

### **Planting**

Once the plants have been checked, they need to be planted in the prepared ground and promptly watered in. The planting channel can be prepared as a single furrow where the plants are placed in the correct position along it and then back filled so that the roots are well covered. Some sand or gravel can also be used to back fill.

When planting, it is important to distribute the plants along the entire pathway system. Therefore, it is recommended that for every 75 m one channel is dug with the correct number of plants to be distributed along it placed in position before backfilling and proceeding to the next 75 m stretch. Without this planning stage, there is a risk of using too many plants in the beginning, so that there are none left to complete the path.



# Conclusion on the planting up of poultry ranges

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In this booklet several ways of planting up poultry ranges are described and there are many more possibilities. The different planting designs represented here are, amongst other things, chosen because they are relatively easy to establish and to care for and because they can fulfil the described goals.

None of the methods described here employ 'nurse' trees or stock trees traditionally used in Denmark to create shelter belts. This may mean that some of the species do not grow so tall in the beginning but they will gradually help each other up. The mosaic planting, where no weed control is practised, has been tested in two plantations which were created 25 and 20 years ago. Despite the presence of weeds at the start, the plantations are well established and some of the weed species functioned as nursery plants (thistle and nettle).

Mosaic planting offers the greatest biodiversity and is easiest to plant and manage. It will offer many diverse areas for the birds because of the combinations of varying height, light and shade conditions. At the same time, it is a method that many farmers reject, primarily because of the level of weeds and the wild appearance of the range in the first years of establishment.

Modular planting is a proven method, and it is relatively easy to apply. Because of the row planting it is easy to control weeds. As the chosen planting method at Ingeborg Holm's farm it will take some time before a beneficial effect on biodiversity can be seen, largely due to the wide spaces between the groves. But over the years, it will be both aesthetically pleasing and productive, and diversity will increase.

Rows planted with willow and poplar are quick to grow, efficient and cheap to establish, but the monoculture does not offer any great biological diversity. However, on-farm experience shows that the birds quickly come to use the planted range.

Pathway planting can further enrich the poultry range regardless of whether mosaic or modular planting is the chosen planting system. Pathway systems create biodiversity while allowing visitors to observe the behaviour of the birds and to enjoy the view over the ranges.

All of the planting systems will improve the range though successful establishment will be determined by how long the plants are given to create strong root systems and hardened bark before the birds are introduced to the range. On Ingeborg Holm's farm, the birds did much damage when given access to young willow plants still with attractive, young, green bark. Hardened off bark is important for all tree and shrub species though not to the same degree as willow.

It is therefore crucial to protect the new plants against birds in larger flocks and this can be achieved by fencing off the planted areas. It is, of course, also possible and effective to use individual plant protectors though this is relatively expensive and requires a lot of extra work.

It is our hope that more poultry farmers will find the courage to create greener organic poultry ranges - for the sake of the birds, biodiversity and visitors.



## Literature

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