

A woman with dark hair tied back, wearing a purple tank top and black shorts, stands smiling in a garden. She is surrounded by various plants, including green leafy vegetables and yellow peppers. A bamboo trellis structure is visible in the background. The text "Make Your Home Garden Flourish" is overlaid in a large, stylized font on the right side of the image.

Make Your Home Garden Flourish

Your
Permaculture Guide
to Crop Rotation,
Companion Plants &
Seasonal Planting
in St. Vincent

The Ecological Home Garden Movement

is part of a 10-year standing action conference by Richmond Vale Academy called “The St. Vincent Climate Compliance Conference 2011 - 2021”. The conference focuses on food, water, and energy security, as well as getting ready for climate change.



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This booklet, created in 2020, is meant as learning material for home garden owners in St. Vincent and the Grenadines, as well as for students of permaculture at the Richmond Vale Academy.



Introduction to the **BOOKLET**

As a brand new home garden owner it may be difficult to know how to get it all started. This booklet discusses three central principles that will help you get your garden going! By reading through, you will learn about

1. Seasons

Which season is best for planting?

2. Crop Rotation

What to plant after harvesting?

3. Companion Planting

Which crops are beneficial grown together?

In a time when the local climate is less and less predictable, and we can no longer trust the rain and dry season to arrive when we expect them, it is more important than ever to increase our knowledge in permaculture, favor native and resilient species in order to prepare ourselves for more extreme weather events.

This booklet guides you through practices that help you maintain healthy soil life and create a garden that is pest-resilient. With time you will learn, how to make best out of space and conditions available to you, and how to increase your quantity and quality of harvest. All this without having to use chemicals in your garden!

While reading, you should keep in mind that permaculture gardening is not exact science: Often we need to try and fail before we get the results we want. For this reason, start today and make observations in your home-garden to see what works best for you!

The Three Principles

Seasons

When is the best season to plant?

Crop rotation

What to plant after harvesting?

Companion planting

Which crops should be planted together?

SEASONS

In this chapter you will learn....



How to protect my garden against the weather?

Which plants go well with the season?

How to plant by the moon?

In St. Vincent and the Grenadines we have two seasons:

The dry season, from January through May.

The wet season, from June through December.

Usually the heaviest rainfall is in July, while the driest weather is in April. In the month of April there is on average only 6 days of rain.

However, in recent years it has become difficult to say when the dry season ends and the wet season begins. Climate change is making weather predictions more and more difficult.

Dealing with this challenge is not easy, but one key is to try to ensure rainwater collection during the drought so you will be able to water your crops through the dry season.

Further, if you plant perennial species (trees and shrubs) in your garden you can create a protective microclimate that cools the air, which your crops will enjoy. Moreover, the roots of trees will protect your land from extreme erosion caused by heavy rainfalls.

Some plants also endure the heat and dryness better than others. The seasonal calendar gives an overview of the best planting and harvesting periods for some of the common crops!

Turn page to see the
seasonal planting calendar



Planting by the moon. Planting is not only dependent on the seasons - Earth's rotation - but empirical evidence shows that the monthly phases of the moon have an impact on the quality of the harvest.

The reasoning for this is that the tides are highest at the time of the new and the full moon when the sun and moon are lined up with the Earth. Moon does not only pull the tides, but also smaller bodies of water underground.

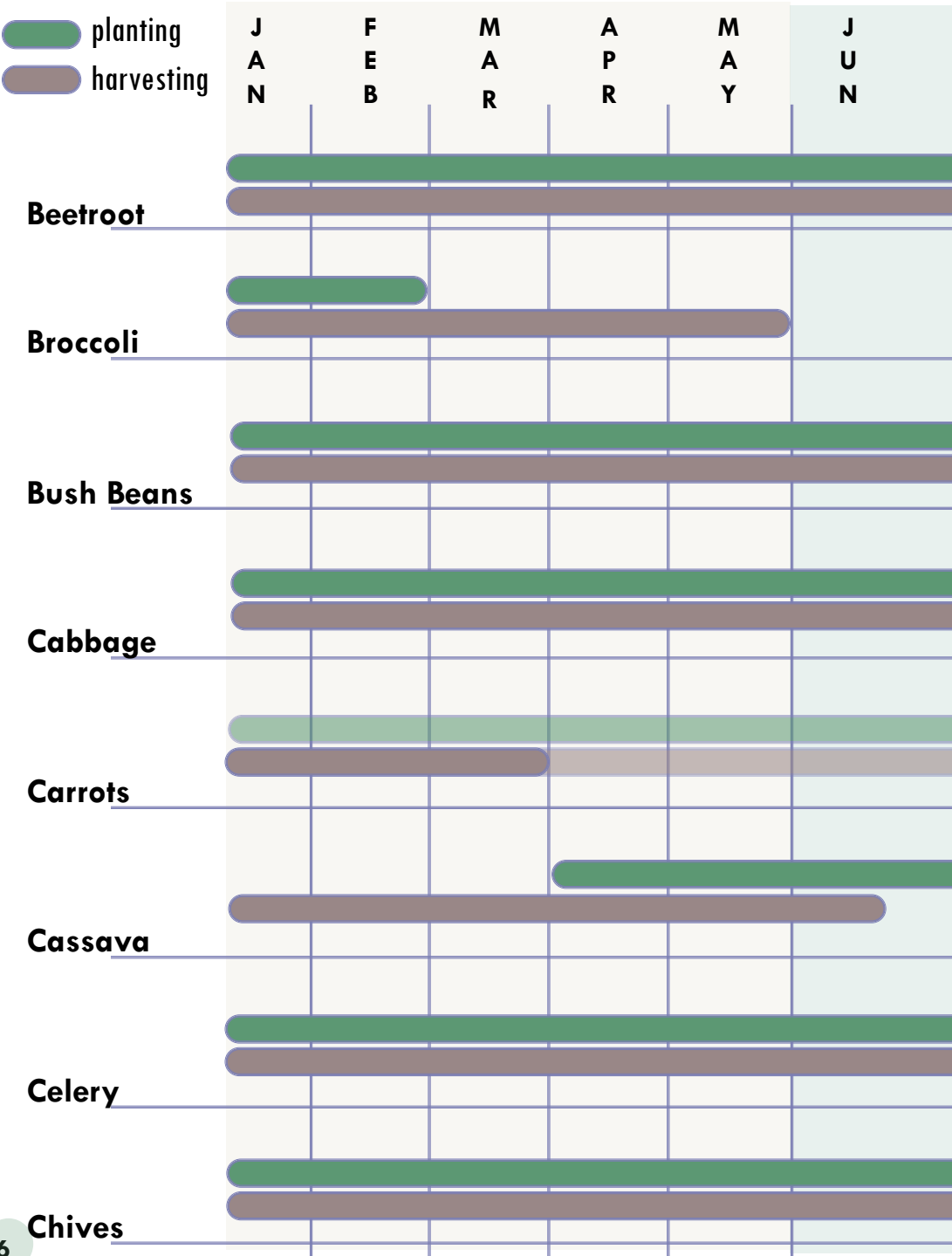
During full moon, the pull effect is the strongest, and this is when the moisture is also in the higher levels of the soil.

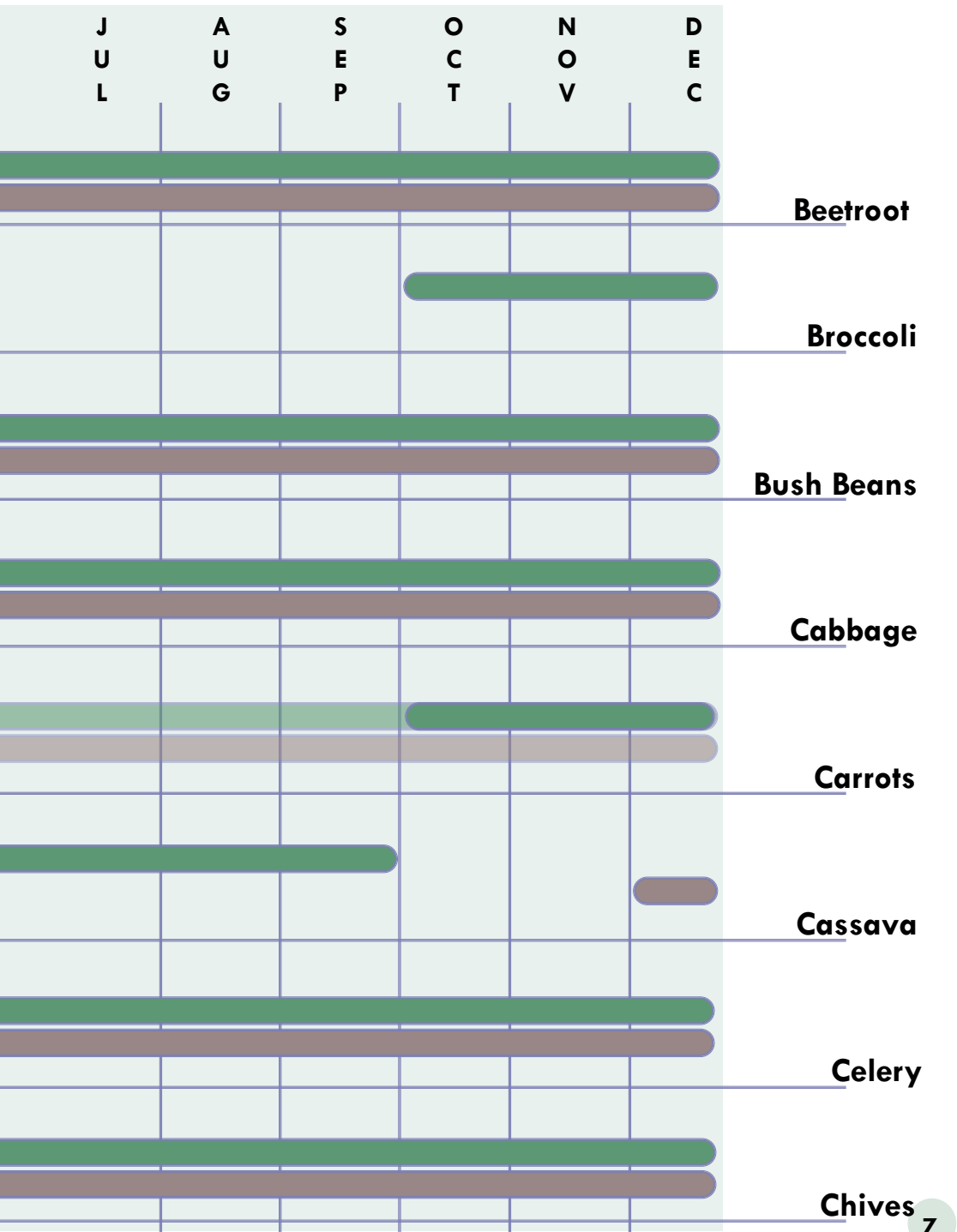
The 'waxing moon' (before and during full moon) is, therefore an ideal time to **plant crops harvested for their leaves, seeds, flowers or fruits**. During the 'waning moon' (after full moon), it is best to **plant root crops**, when the moisture is deeper underground.

SEASON CALENDAR

planting

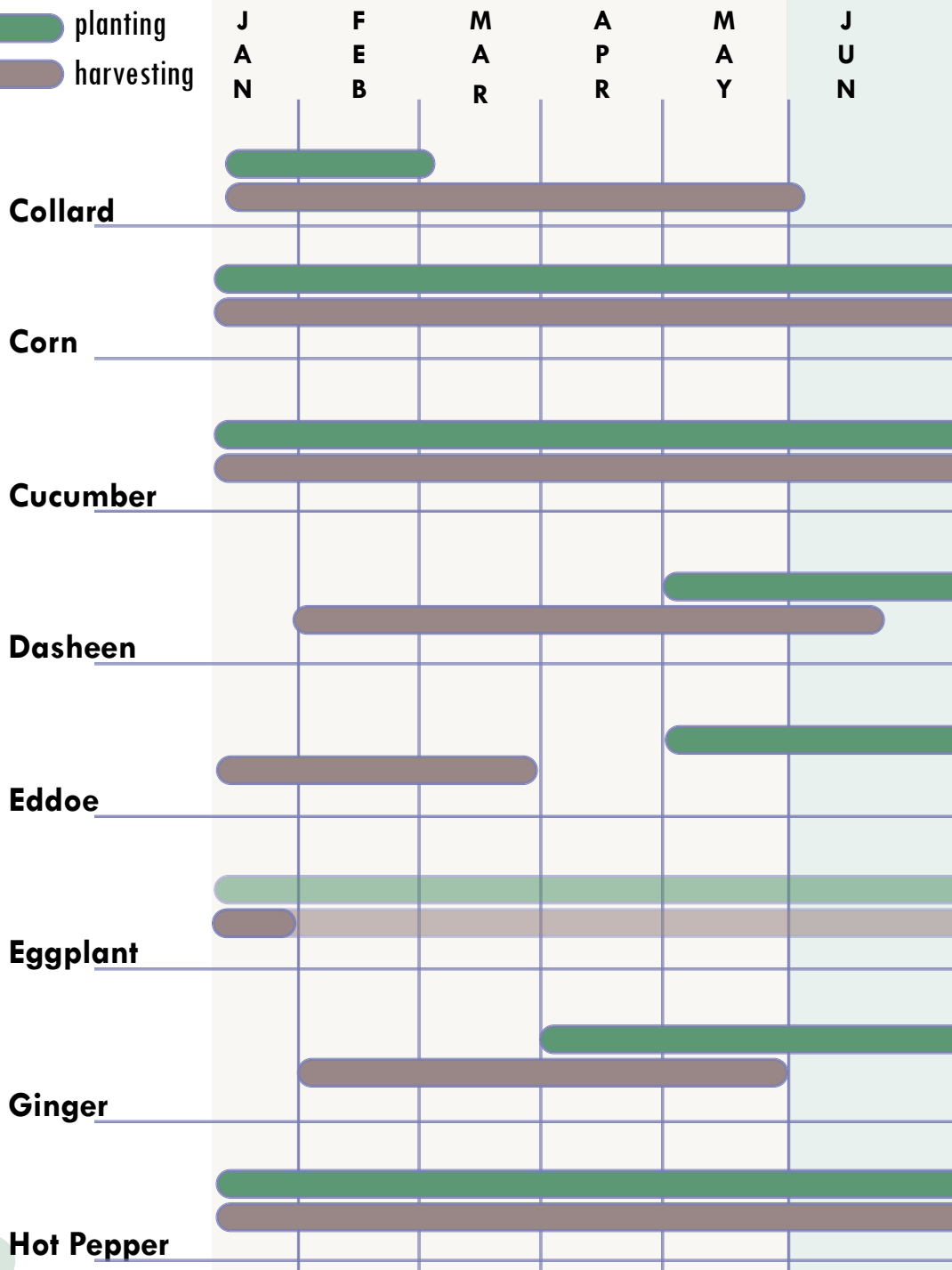
harvesting

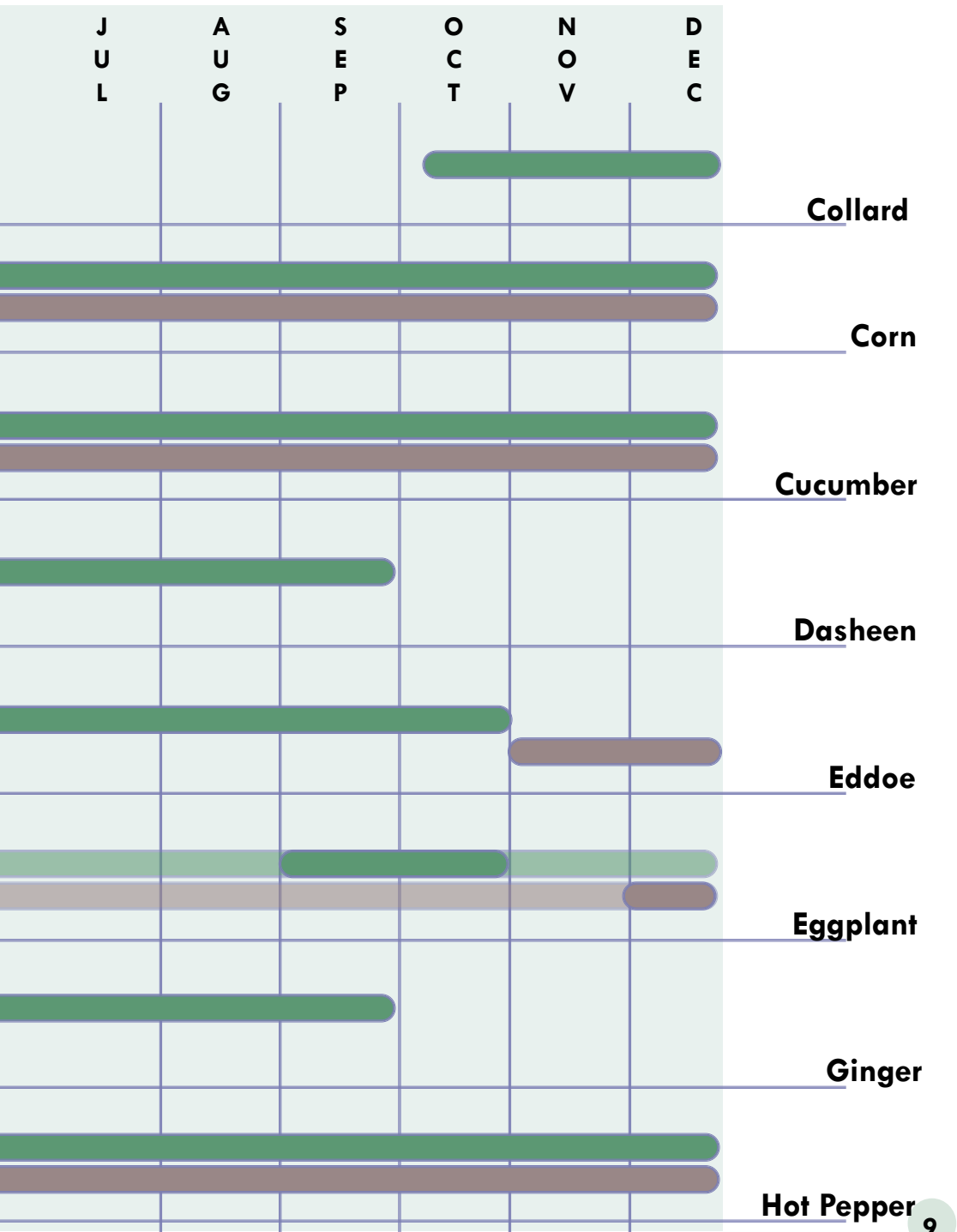




SEASON CALENDAR

 planting
 harvesting

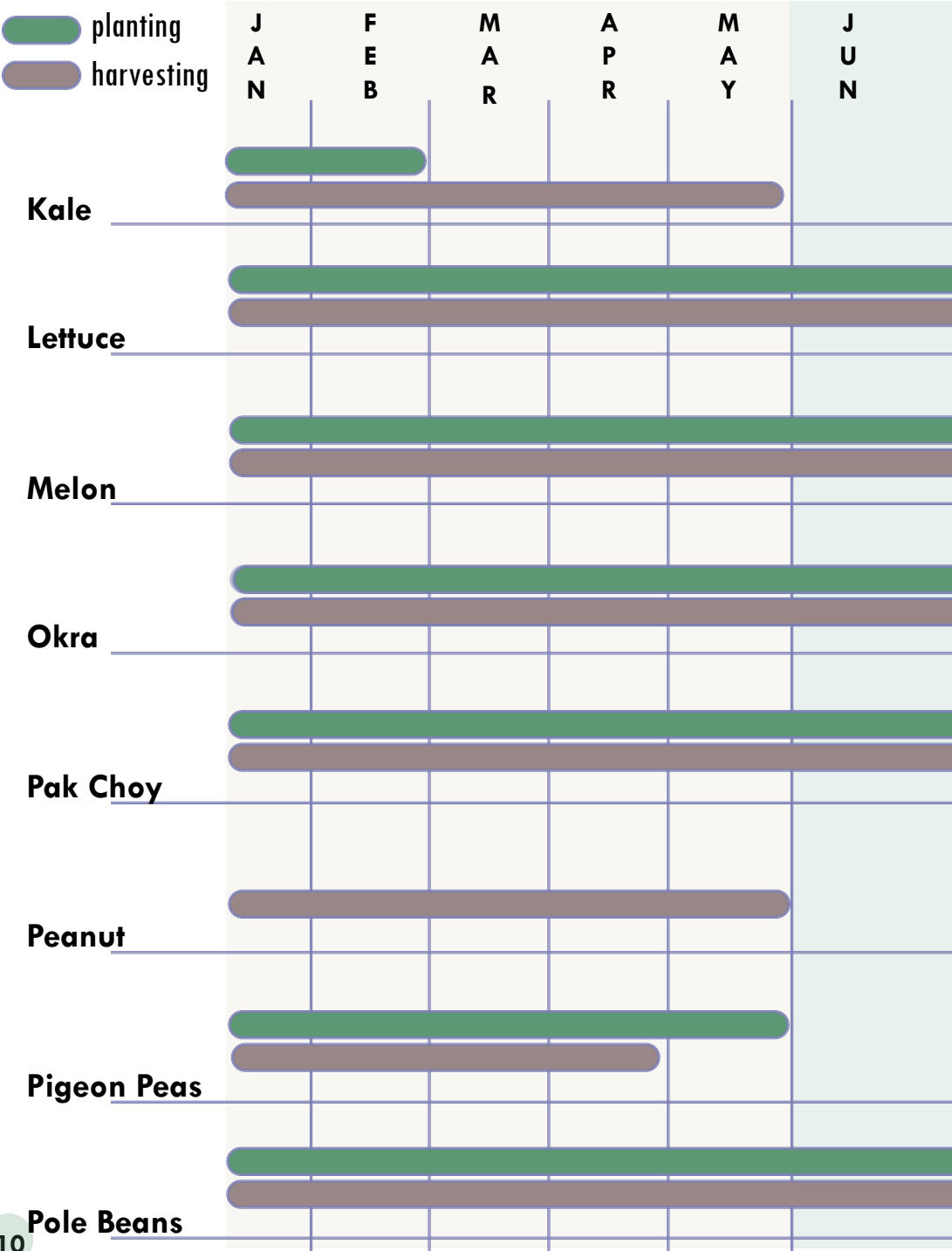


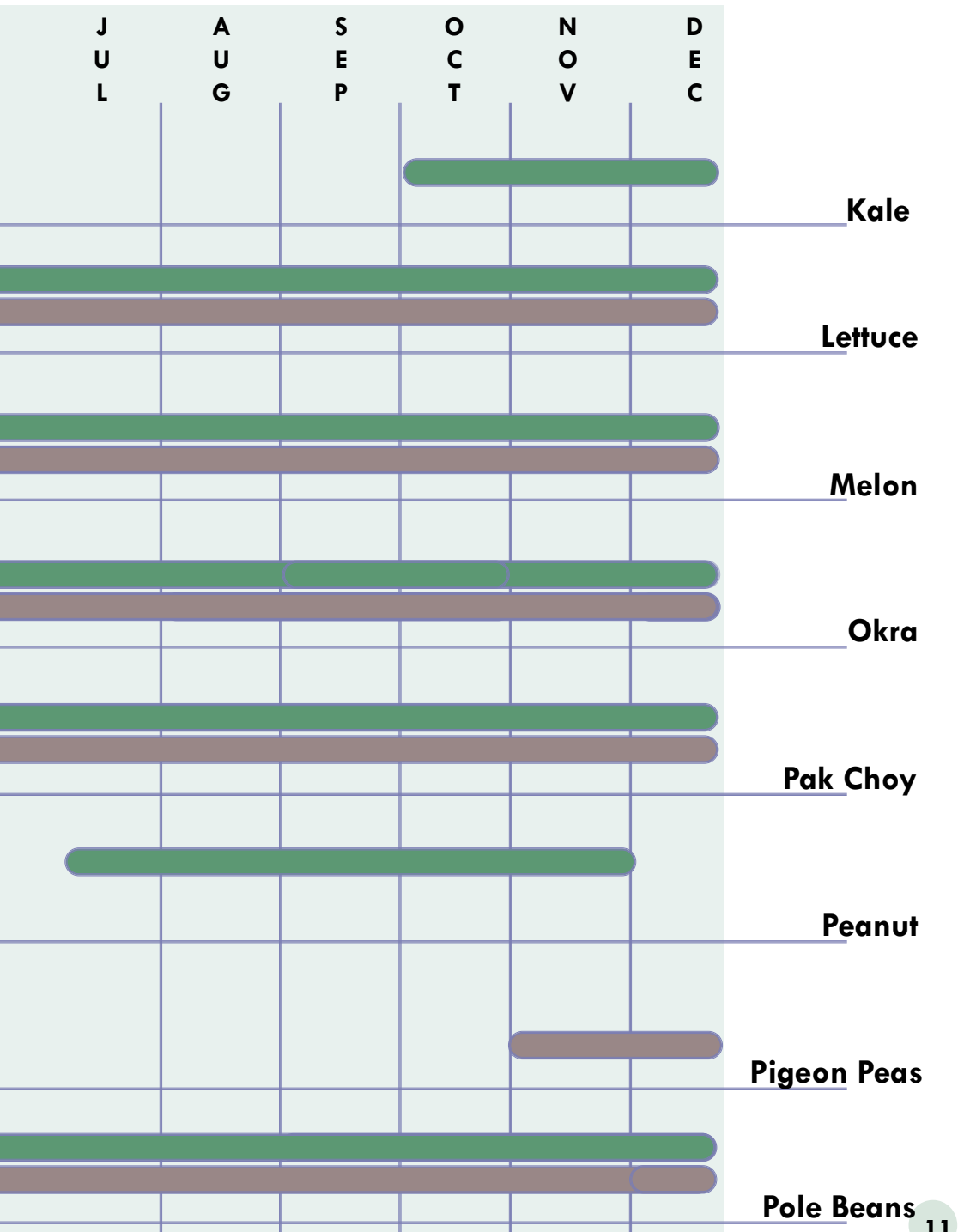


SEASON CALENDAR

planting

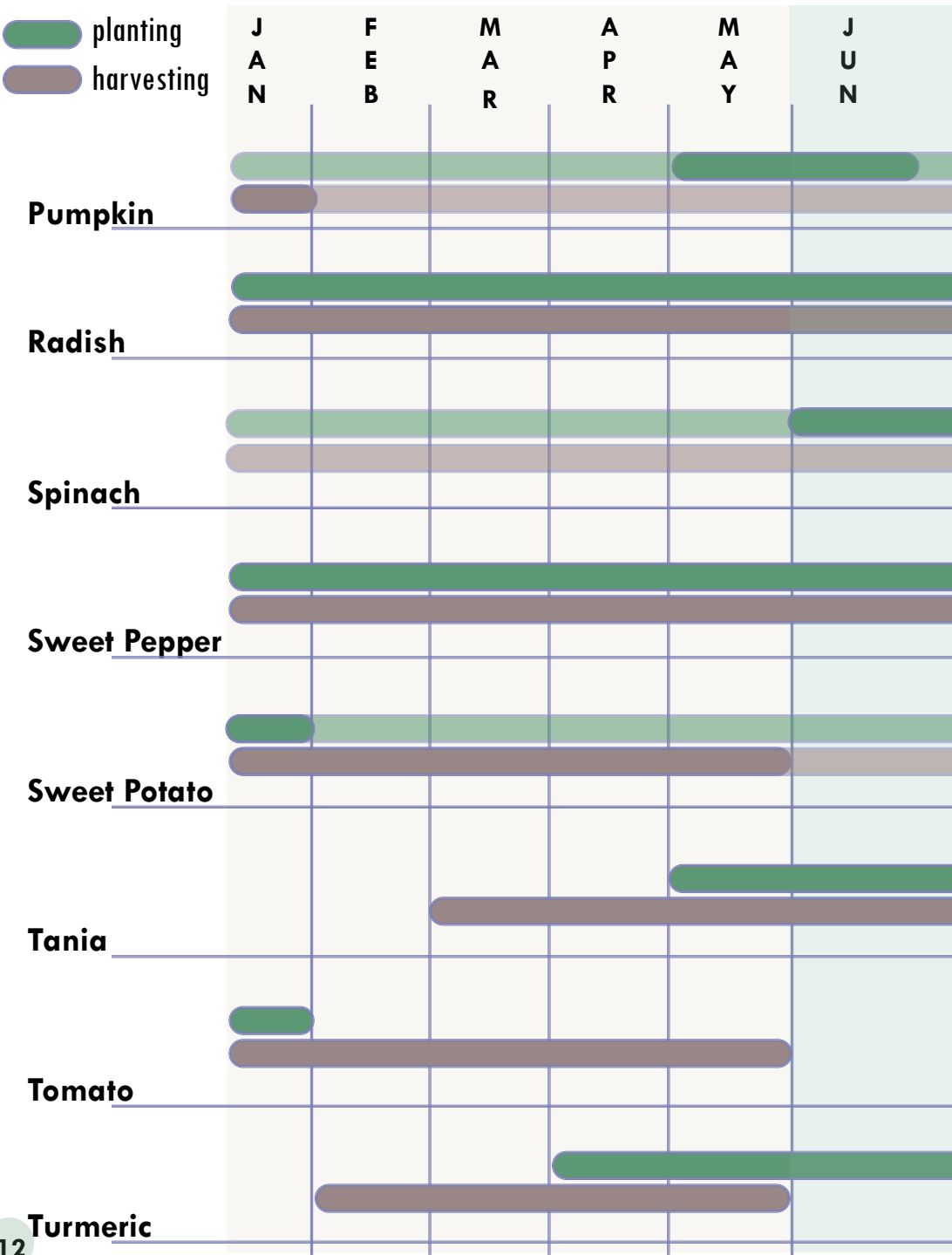
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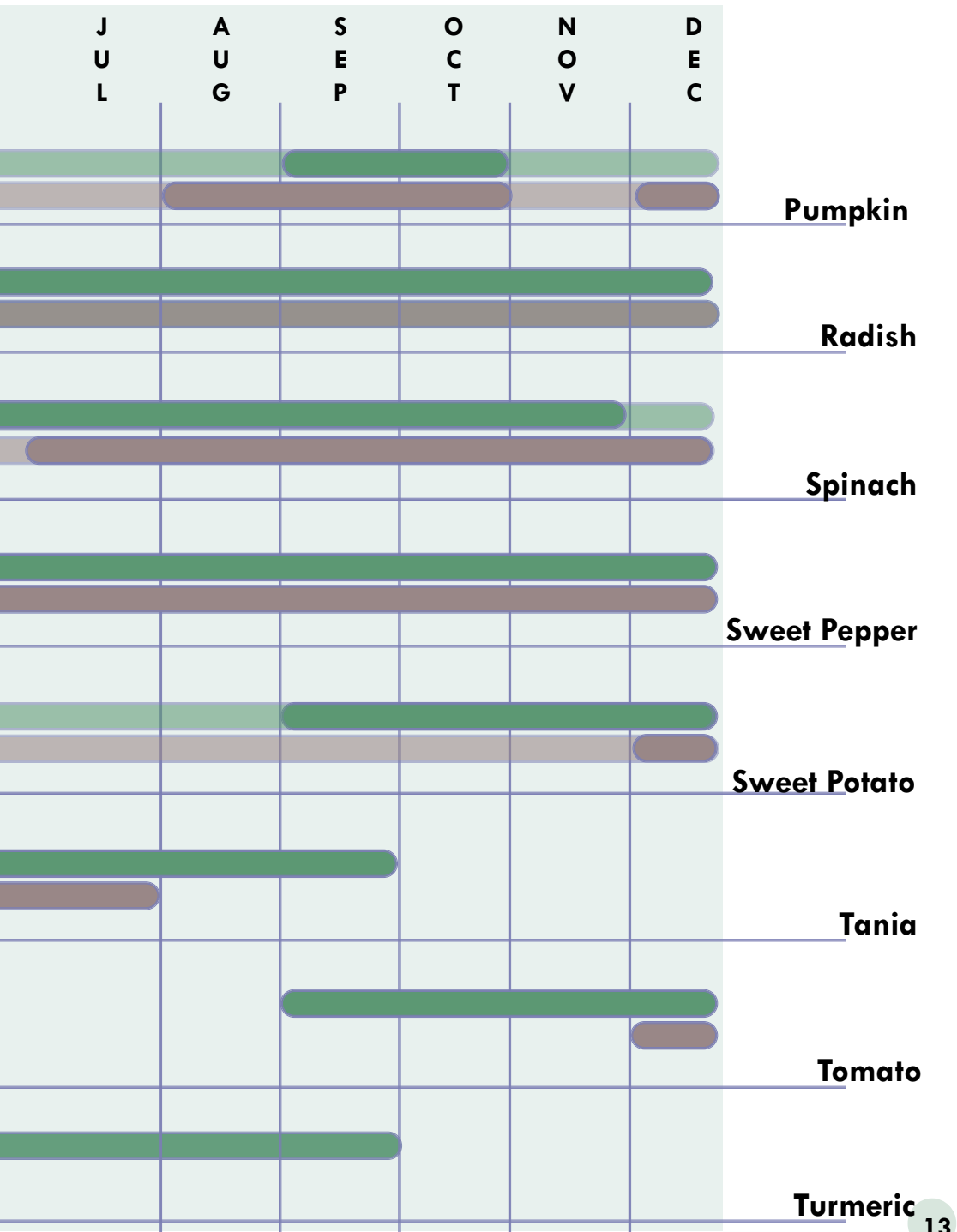




SEASON CALENDAR

 planting
 harvesting





The Three Principles

Seasons

When is the best season to plant?

Crop rotation

What to plant after harvesting?

Companion planting

Which crops should be planted together?

CROP ROTATION

In this chapter you will learn....



What are the advantages of permaculture gardening?

How to create a crop rotation based on nitrogen?

A common problem for all farmers is how to make sure that the soil remains nutritious enough for the production to continue. In order to make your garden flourish, you should focus on **farming the soil**, rather than the plants.

In conventional agriculture, nutritious soil is farmed in the following way:

Monocropping

means growing only one plant species in your garden. If you continuously plant the same variety you see that over time your yield will start shrinking and diseases will start spreading as you are endangering the health of your soil.

Chemical Fertilizing

is used to respond to the worsening soil quality caused by monocropping and mass production. Because you are draining the soil fertility you will have to bring it from outside sources, thus putting money on expensive fertilizers.

More chemicals

are added as the yield gets smaller. It seems logical to start using insecticides/weedicides/pesticides to protect your crops. This is making your garden dependent on chemicals, which are dangerous for your health.

In conventional farming you notice how there are no weeds, insects or birds around the cultivation. Some think this is a victory. Yet, what you actually witness is a destroyed ecosystem. **Chemicals kills not only harmful pests, but everything that lives in your soil.** Pollution and declining insect populations are another reason why wildlife starts avoiding your garden.

In permaculture, the aim is to create an ecosystem not to destroy it. This is achieved by following these three principles:

Intercropping

is the practice of growing different plant species on the same bed at the same time. It is a guarantee against losing some of your yield, against attacks of pests, and it allows you to make use of companion planting benefits.

Nitrogen-fixing

legumes - beans, peas etc. - fix nitrogen from the air into the soil. Compost and bird manure fulfill most of your fertilizing needs. So no need to buy chemical fertilizer - just include legumes in your crop rotation!

Natural pesticides

aromatic herbs and flowers are part of the ecosystem attracting birds, insects and other beneficial species in your garden. The right kind of companion planting can help you get rid of the unwanted pests.

CROP ROTATION

Replacing Chemicals with the Natural Sources

You probably have come across the abbreviation 'NPK' when dealing with chemical fertilizers. However, Nitrogen (N), Phosphorus (P) and Potassium (K) are all elements, which are easy and practically free to source from nature.

N for Nitrogen

Nitrogen is needed for leaf growth. It also helps the plants produce the dark green leaf color, which allows them to do photosynthesis (ie. produce sugar). The best natural sources for nitrogen are:

- Planting peas and beans
The legume family captures nitrogen from the atmosphere and stores it in their roots, making it available for other plants.
- Bird manure
Best as compost.
- Urine
- Grass clippings
- Coffee grounds
- Compost
- Seaweed

P for Phosphorus

Phosphorus is crucial for the plants' root growth, as well as for making seeds, fruits and flowers. Plants also need it to fight against different diseases. The best natural sources for phosphorus are:

- Palm leaves
The roots of the palm makes connections with mycelium fungi; use the leaves as mulch or bury them into the soil.
- Bird manure
Best as compost.
- Compost
- Coffee grounds
- Rock dust
- Seaweed

K for Potassium

Plants use potassium to regulate the CO₂ uptake, do photosynthesis, fight against pest and diseases, and transport sugar, water and nutrients. The best natural sources for potassium are:

- Banana body, leaves and peel
Cut the banana in pieces. Use it as mulch or bury it into the soil.
- Compost
- Rock dust
- Ash from hard wood
- Seaweed



The chemical industry wants to convince us that we can only fertilize our crops by using the chemical products they are selling. However, our ancestors grew food ecologically for millennia before the invention of these fertilizers. By learning about the basic needs of the plant, you can become independent from these companies.

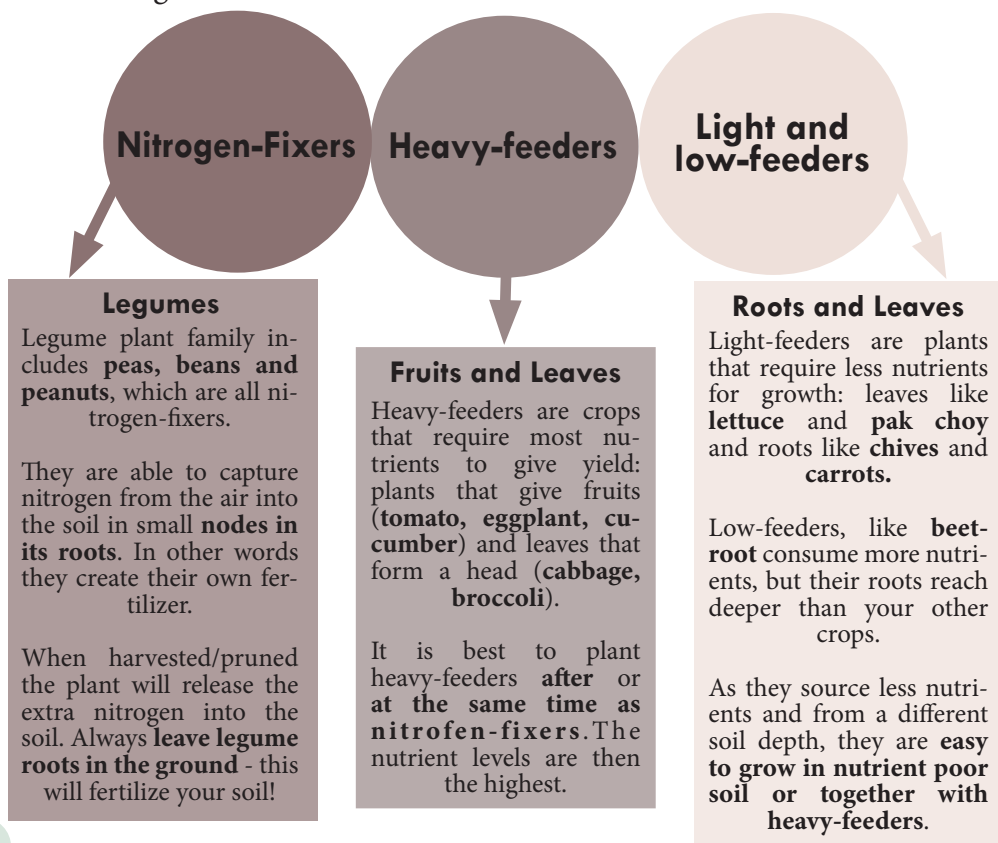
CROP ROTATION

A simple rotation based on nitrogen-fixing

There are three basic ways to bring nutrients into your soil without using chemicals:

1. **Mulch** - *grass clippings, palm leaves, banana body...*
2. **Natural Fertilizers** - *bird manure, compost, urine...*
3. **Nitrogen-fixing** - *crop rotation utilizing legumes*

Crop rotation considers different characteristics of plants and their impact on the nutrient levels in your soil. We want to sustain the nitrogen levels in the soil, but also make use of the fact that some plants prefer a soil with less nitrogen. Different plants can be categorised into three groups based on their nitrogen needs:

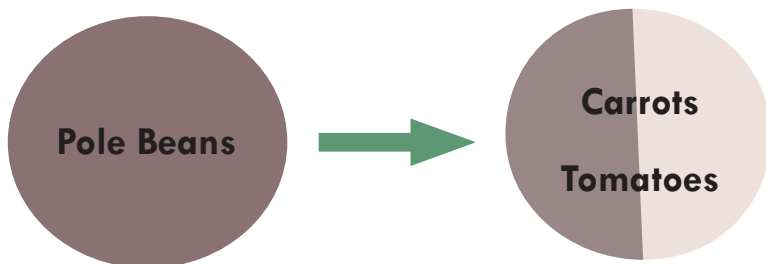


To get the best results, you should

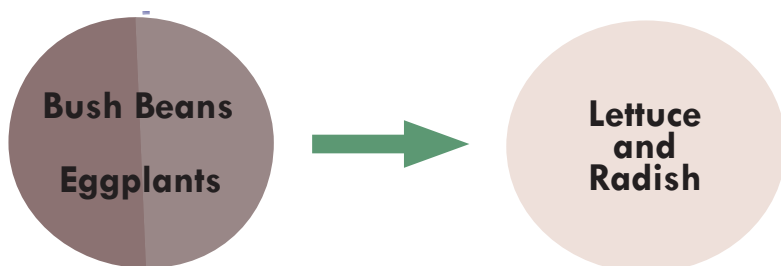
1. **Rotate** legumes regularly on your garden beds
2. **Intercrop** - in other words, plant multiple plant species on the same bed.

When you intercrop, you can, for instance, enrich your soil by planting nitrogen-fixers. Or you can plant low-feeders with heavy-feeders so that more nutrient levels are utilized at the same time. By rotating your crops regularly, you will not only restore nutrient levels, but also avoid nesting plant diseases and exploding pest populations caused by monoculture. Furthermore, different crops have different nutritional benefits!

Rotation Examples



You start this rotation by planting pole beans, that will bring nitrogen from the air into your soil. After harvesting, you will plant tomatoes, a heavy-feeder, together with carrots, a low-feeder. Tomatoes and Carrots won't compete for nutrients as they take them from different soil levels.



Another way to rotate, is to grow first, for instance, bush beans with eggplants: a nitrogen-fixer with a heavy-feeder. After harvest, you can plant lettuce and radish that do not mind growing in less nutritious soil.

The Three Principles

Seasons

When is the best season to plant?

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Companion planting

Which crops should be planted together?

Companion Planting

In this chapter you will learn....



**What
are the
advantages
of companion
planting?**

Companion planting means that a plant has properties that can benefit another plant, if they grow next to each other. All plants exude distinct chemicals and have different odours, which deter and attract pests and beneficial insects. These chemicals can discourage or encourage the growth of another plant. Learning which crops to combine with which has many advantages, and will make your garden flourish!

Some Advantages of Companion Planting

1. More yield in the same amount of space
2. More beneficial species attracted
3. Less damage caused by pests
4. Less fertilizers needed
5. Improved growth
6. Better flavour

Turn to page 38 to take a closer look at companion plants!



1. More yield in the same amount of space

Most crops are happy to share the space where they grow. There is generally always a chance to plant in layers once you **get creative**. Think about eggplants, for example. Eggplants take around three months before they give fruit, and they will stay on your bed even longer. You can make use of the space that you leave between your eggplants (see pages 42-47 for planting distances), and plant a light-feeder like lettuce or pak choy, which do not compete with nutrients. Lettuce and pak choy will appreciate the shade - especially during the dry season. Furthermore, in a small garden, this is a great way to save space: double yield in the same amount of space!

2. More beneficial species attracted

The greater the plant variety in your garden, the greater is also the number of visitors you will receive. **A permaculture garden is at its best an ecosystem for your soil microbes, insects, birds and other creatures.** Many of these help your plants to have a healthy life. For instance, to produce fruits, some plants depend on bees and other pollinators. Ants, on the other hand, work hard to aerate your soil by digging tunnels underground. Birds instead will help you control your insect population by eating, for instance, caterpillars and snails.

3. Less damage caused by pests

Pests often specialize in eating a specific plant family (*see pages 36-41 for plant families*). If you **use different plant families** as companion plants, you will make sure that even if there is a pest outbreak, you will save some of your yield.

Further, the **strong aroma** of herbs, flowers (especially marigold) and the onion family, deter unwanted pests from your garden. For example, planting chives together with kale makes the cabbage worm steer clear from your crops. Some plants also use self-defense against pests. For instance, the wild tobacco sends out a **chemical signal**, when it is under attack, which attracts beneficials - the enemies of the pest.

Another approach to pest control is the so-called **trap cropping**. In this approach, you use a crop as an attraction for pests. Placing trap crops on the edges of your garden (preferably not on the beds) means that pests will attack them in place of the crop you are trying to grow. Once the bait has been taken, remove the plant and destroy the pest population so that they won't get the chance to spread.

4. Improved Growth

All plants make a variety of chemical compounds in the rhizosphere (in their roots) which help them capture nutrients from the soil, and to hold water and its surrounding soil particles together. When doing this, some plants exude **chemicals, that can have a beneficial or detrimental effect on its surroundings**. While researchers still try to understand the role of these so-called allelochemicals, evidence would seem to show that, for instance, the onion family plants inhibit the growth of beans if they are planted too close to each other.

In many cases your plants benefit from having a companion for other than alleopathic reasons. For instance, **planting heavy-feeders with nitrogen-fixers** will provide extra nitrogen into the soil. A **physical characteristic** of a plant - its height, for instance - can be helpful too. Climbing beans, for example, grow well on corn stems. On the other hand, fragile pepper seedlings enjoy **wind protection** placed next to a sturdier plant like okra. Vines, such as melon, spinach or squash, offer great **protective ground cover** for the roots of your other crops.

5. Less fertilizers needed

Monoculture means continuously planting the same plant variety on your garden beds without rotating with others. Over time, your soil will deplete of nutrients that the plant needs for its growth. This means that your soil becomes poor, and the plants do not produce the same way they did before. Many farmers then add fertilizers to keep the production levels up.

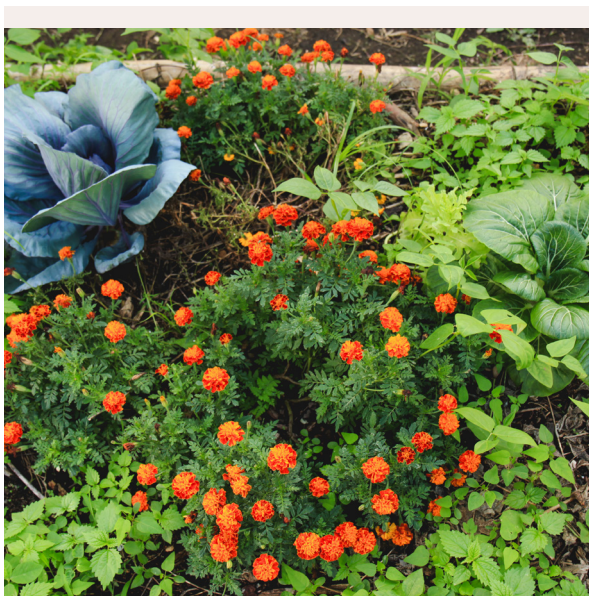
There is an alternative, however. Including **nitrogen-fixing** beans and peas as your companion plants will work as a natural fertilizer next to the mulch, compost, animal dung and other natural fertilizers.

Furthermore, you can make use of the fact that **different crops require different nutrients, and that they take them from different soil levels**. This means that you can produce more with the same amount of space without having to add extra fertilizers.

Not everything should be grown together. Placing two crops, say tomato and corn, next to each other may not give you the best results, as they both need plenty of nutrients to grow and have similar root depths. On the contrary, placing tomatoes with carrots seems more logical: tomato is a fruit, and thus a heavy-feeder while carrot forms the best roots in nutrition-poor conditions.

6. Better Flavor

Some plants - especially herbs - have a **flavour bettering effect** on its neighbor crops. For example, it has been observed that planting mint on the same bed as Cabbage (Brassica) Family crops can make them taste better! Some evidence also shows that planting lettuce next to radish protects its flavor and prevents it from becoming bitter.



The Three Principles

Seasons

When is the best season to plant?

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Which crops should be planted together?

Yearly Crop Rotation

In this chapter you will learn....

**How to
combine all
three
principles?**



By following the instructions of this booklet, you will see how crop rotation and companion planting become your secret recipes in the garden. This way you can avoid using chemical fertilisers - which threaten both the health of your soil and your family! Instead of creating monocultures, you will mirror natural ecosystems. You will make your soil healthy without depleting it of nutrients.

In the next pages, we will take a look at some examples of crop rotation and companion planting you can use in your garden. One spread represents one bed, and how to plant it for one year. Gardening is by nature about trial and error. Once you get the gist of some of the core concepts, do not shy away from trying new combinations of plants to see what works best in your home garden! Try out these samples, but make notes so you can improve your garden for the next year ahead!



Yearly Crop Rotation 1



Benefits of Mint

Mint is not only excellent for tea and as a spice, but it also improves the flavour of the cabbage family plants. It has a strong aroma, which confuses and deters pests from your garden. As mint tends to be invasive, it is more easily controlled if planted at the ends of the bed or right next to it.

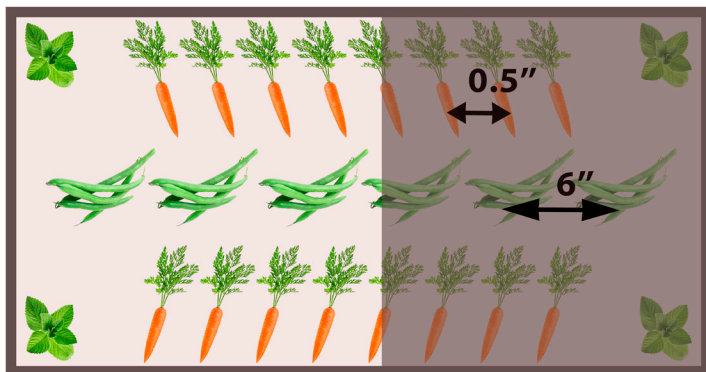
May

Plant mint, carrots and bush beans.

July

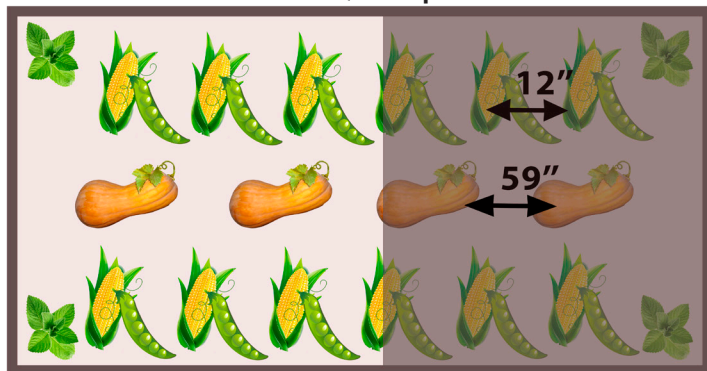
First beans ready for harvest!

1. Carrots & Bush Beans



This rotation starts with a regenerative phase. By planting **carrots**, a low-feeder, with **bush beans**, a nitrogen-fixer, you are preparing your garden bed for planting heavy-feeders later on in the year. Carrots and bush beans also make good companions for other reasons. Carrots break the soil structure when they push into the ground. This helps bush beans to spread their fine roots more easily. Bush beans also deter weeds thanks to its low ground cover.

2. The Three Sisters: Corn, Pumpkin & Pole Beans

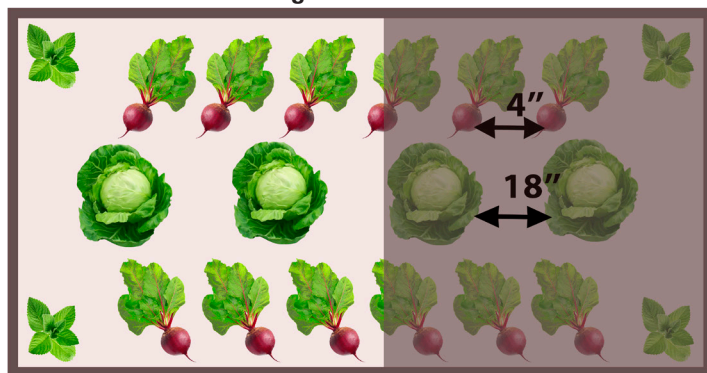


The three sisters is an ancient example of companion planting where all three species benefit : **Corn** provides a climbing structure for **pole beans** that fix nitrogen in the soil providing fertilizer. **Squash**, on the other hand, cools the ground, keeps it moist and deters weeds and pests from the roots of corn and beans. Here corn and squash are heavy-feeders, which are complemented by the pole bean - a nitrogen-fixer.

August
Your carrots can now be harvested. Replant the bed by seeding squash and corn directly. After two weeks, plant the pole beans next to the corn.

October
Seed beets and cabbage.

3. Beetroots & Cabbage



The third rotation makes use of the fact that **beetroot** takes nutrients from a lower level of the soil than **cabbage** - they will not compete with each other and the nutrients in your bed will be fully utilized. After harvesting the beetroots, you can plant **lettuce** in the empty spaces next to the cabbage where it will enjoy the cool shade and deter weeds while the head of the cabbage is forming.

November
You can now harvest all three sisters! Plant beets and cabbage.

January
Your beets are ready to be harvested. You can plant lettuce in their place.

February
Your cabbage and lettuce are ready to be harvested.

Yearly Crop Rotation 2



Benefits of Basil

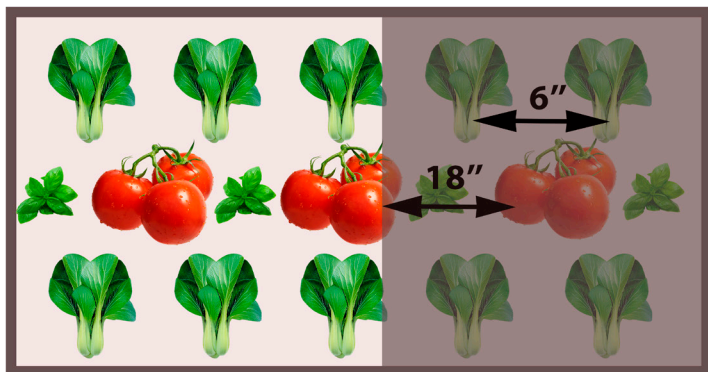
Many gardeners say that basil improves the flavour and health of your tomato plant. Beyond this, it is a great repellent of insects - such as mites and aphids - and it deters diseases from the bean and cabbage families. Make your basil perennial by clipping the flower once it forms. You can use basil for seasoning and pesto, for instance.

May
Seed basil, tomato
and pak choy.

June
Plant basil, tomato
and pak choy.

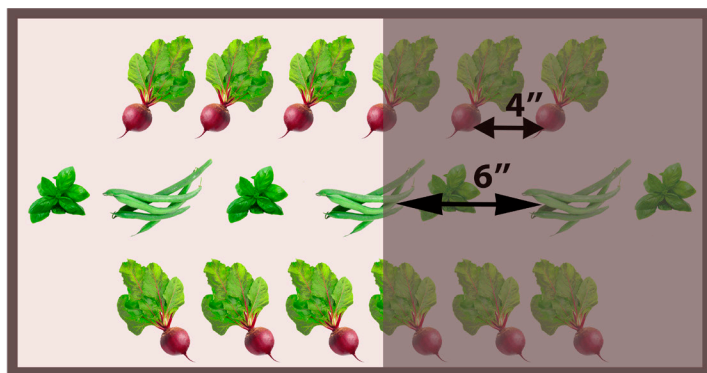
July
Harvest pak choy.
Seed beetroots.

1. Tomato & Pak Choy



This rotation starts with a combination of a heavy-feeder, tomato, and a light-feeder, pak choy. Tomato plant's roots extend deeper than those of pak choy - there is therefore little competition for nutrients when you grow them together. Pak choy also has other helpful qualities, as growing them densely next to your tomatoes means that you have to weed much less. Because your pak choy can be harvested much earlier than your tomatoes, you can consider having two successions of it while you wait for the tomatoes. Growing **basil** has most benefits if you plant it in-between your tomato plants.

2. Beetroots & Bush Beans



The next phase of the rotation is a more regenerative phase, where you combine a low-feeder, beetroot, with a nitrogen-fixer, bush beans. Beetroots are a helpful companion to bush beans as they are able to break the soil structure, which encouraged the growth of bush beans' roots. In turn, bush beans deter weeds thanks to their low ground cover. Don't plant pole beans with beetroots, however - they tend to inhibit each others' growth.

3. Broccoli & Chives



The third rotation phase combines a heavy-feeder, broccoli, with a light-feeder, chive. It is good to plant a heavy-feeder, such as broccoli, in a rotation after beans, so that you know you have extra nitrogen in the soil. Broccoli is often bothered by a variety of pests attracted by the cabbage family (Brassicaceae). Chives, which belong to the onion family, naturally deter these pests making it a great companion for broccoli or other cabbage family plants.

August

Your tomatoes are ready to be harvested. When the plant stops producing, clean the bed and replant with beetroots and bush beans.

September

Seed broccoli.

October

Bush beans and beetroots are ready for harvest. Plant broccoli and chives.

January

Your broccoli is ready for harvest!

Yearly Crop Rotation 3

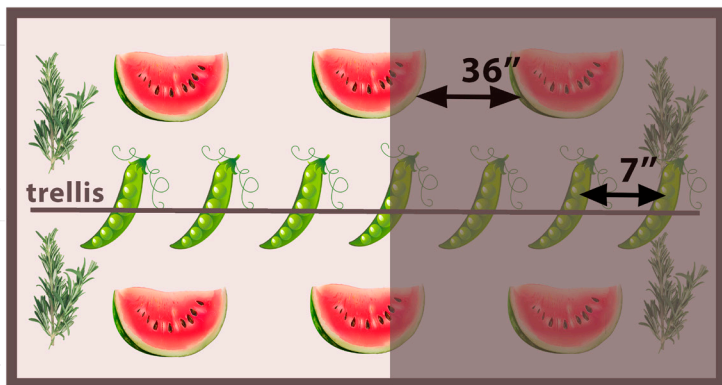


Benefits of Rosemary

Rosemary is an aromatic plant that draws in pollinating insects into your garden and distracts pests from finding the plants that they want. As it has the same growing requirements as peanuts it will thrive in similar conditions, making them ideal companion plants. Rosemary can be used to season many different types of dishes.

May
Plant melon and
pole beans.

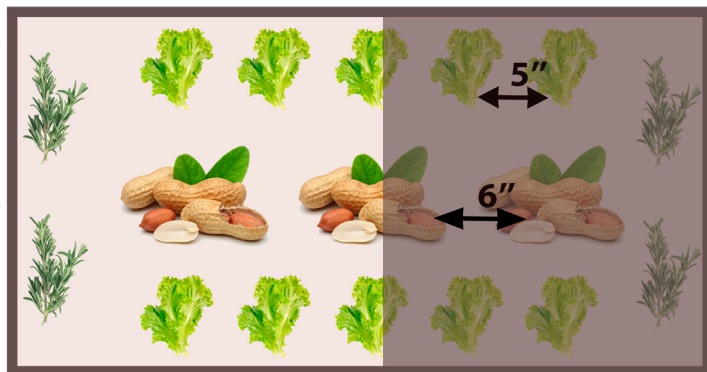
1. Melon & Pole Beans



July
Seed lettuce.

This rotation starts with a combination of a heavy-feeder, melon, and a nitrogen-fixer, pole beans. Heavy-feeders, such as melons, are best grown together with nitrogen-fixers to give them a good source of fertilizer. For this bed, you should put up a trellis on which the pole beans can climb. Thanks to the bushy ground cover of the melons, you need to weed much less around the plants.

2. Peanuts & Lettuce



The next rotation is a regenerative phase, where you combine a light-feeder, lettuce, with a nitrogen-fixer, peanuts. Peanuts like calcium-rich soil! The melon leaves are a great source of calcium, so make sure to leave them when you are cleaning the bed for this rotation. Lettuce is an excellent companion for peanuts as it does not grow too large. While you wait for your peanuts, you can grow more lettuce or other light-feeders, such as chinese cabbage, for instance.

3. Kale & Carrot



The third rotation phase combines a heavy-feeder, kale, with a low-feeder, carrot. Kale requires a lot of nutrients, which is why it is good that it follows legumes in the rotation. Carrots and kale make good companions, as they both take nutrients from different soil levels. Make your kale perennial by harvesting with caution and leaving minimum seven leaves on the plant. After you have harvested the carrots you can plant the again or grow another type of low or light-feeder next to the kale.

August

Your melon and pole beans can be harvested. Plant lettuce and peanuts.

October

Seed kale.

November

Your peanuts are ready for harvest. Now plant kale and carrot.

January

You can now harvest your carrot and kale.

Yearly Crop Rotation 4

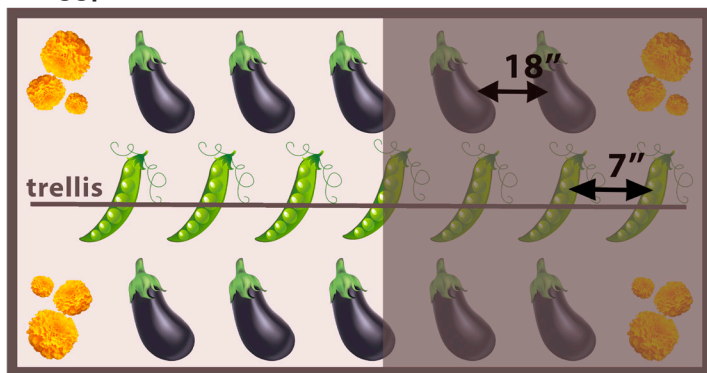


Benefits of Marigold

Marigold flowers repel beetles from eggplants, beans and cucumbers. They also produce a substance that suppresses nematodes—the microscopic worms that attack the roots of your plants. To repel nematodes, you have to plant marigolds on the bed a full year before. As cucumbers dislike aromatic herbs, marigold is a good companion plant to use in this bed rotation.

October
Seed eggplants.

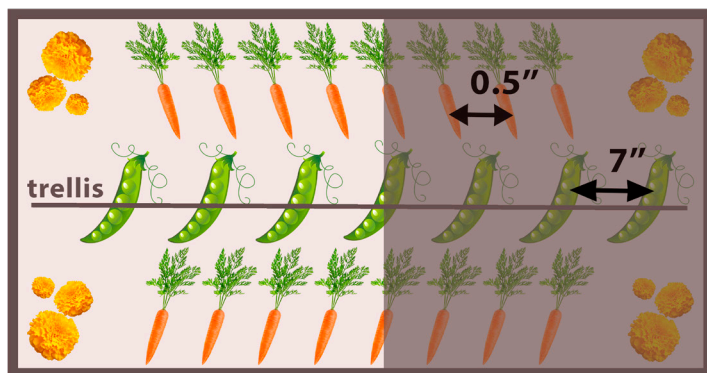
1. Eggplant & Pole Beans



November
Plant eggplants and
pole beans.

This rotation starts with a combination of a heavy-feeder, eggplant, and a nitrogen-fixer, pole beans. Heavy-feeders such as the eggplant, are good to grow next to legumes that fix nitrogen, for instance pole beans. Put up a trellis for the pole beans so they can climb, and so that they do not strangle your young eggplants. If you want, you can grow lettuce next to the eggplants as you will harvest it before the eggplants start overshadowing the space beside them.

2. Carrots & Pole Beans



The next rotation is a regenerative phase, where you combine a low-feeder, carrots, with a nitrogen-fixer, pole beans. As the final rotation will be with two heavy-feeders it is smart to precede with a bed that does not deplete all the nutrients. Growing carrots that take nutrients from low levels with pole beans that fix nitrogen into soil is a good way to prepare for the next bed.

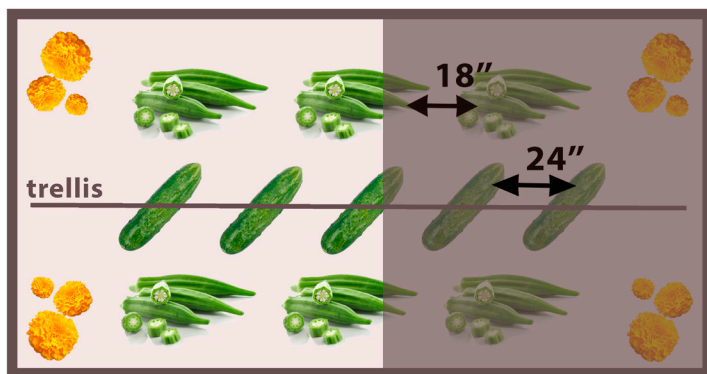
February

Your eggplants and pole beans can be harvested. Plant carrots and another round of pole beans.

April

Seed cucumber.

3. Cucumber & Okra



The third rotation phase combines two heavy-feeders, okra and cucumber. Okra and cucumber make good growing companions as they both grow tall, which is why both are able to reach sun and not be overshadowed by the other. You will save space by planting cucumbers on a trellis. Okra brings a lot of shade, which you can use to your advantage to protect your crop, such as lettuce, against the harsh sun.

May

Your carrots and pole beans are ready for harvest. Now plant cucumber and okra.

August

You can now harvest your cucumber and okra.

Yearly Crop Rotation 5

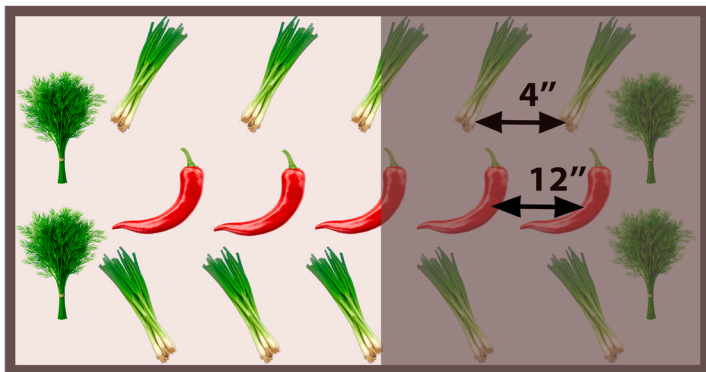


Benefits of Dill

Dill draws beneficial insects into your garden, thanks to its aroma. You will definitely see an increase in ladybugs, if you plant dill, which are also the predator of aphids! Dill discourages unwanted pests of the cabbage family too. Avoid growing dill close to carrots, however, as it is known to stunt their growth. Dill can be used to season many different dishes.

October
Seed hot pepper.

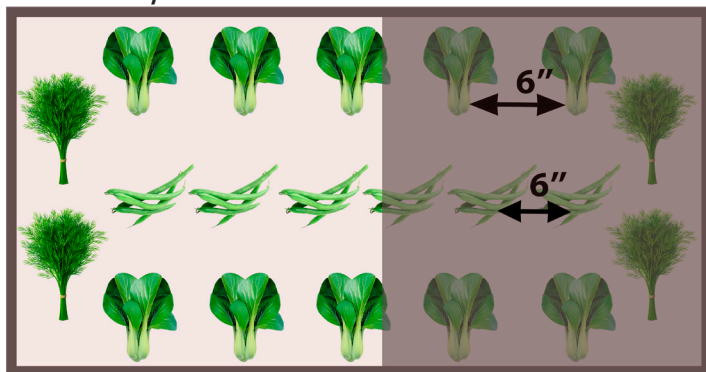
1. Hot Pepper & Chives



November
Plant chives and hot pepper.

This rotation starts with a combination of a heavy-feeder, hot pepper, and a light-feeder, chive. The onion family plants are great pest repellents thanks to their aromatic smell. Growing chives near hot peppers can therefore help you deter aphids and other insects. It is also argued that growing chives near your main crop improve its flavour and yield.

2. Pak Choy & Bush Beans



The next rotation is a regenerative phase, where you combine a light-feeder, pak choy, with a nitrogen-fixer, bush beans. Planting bush beans lets you restore the nutrient levels in your bed. If you want, grow a leafy green such as pak choy next to the beans - keep a good distance between the rows, however so that both have enough room to grow.

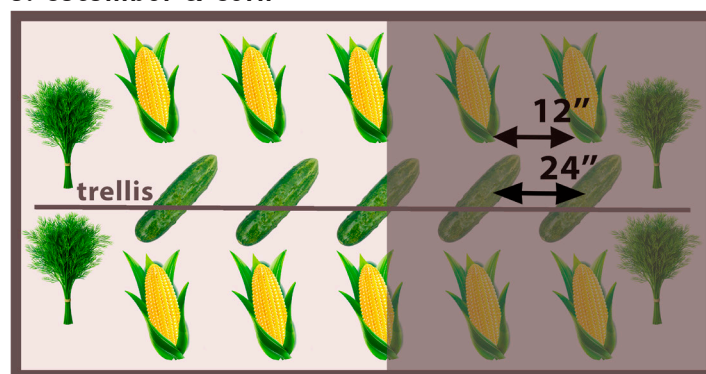
March

Your last hot peppers can now be harvested. Plant bush beans and pak choy.

April

Your pak choy can be harvested. Seed cucumber.

3. Cucumber & Corn



The third rotation phase combines two heavy-feeders, cucumber and corn. Corn is known to protect cucumber against a virus causing wilt. In turn, cucumber has an ant-repelling scent - and ants tend to disturb corn a lot. As corn brings a lot of shade you can use this to your advantage if you have crops needing protection from the harsh sun, for example lettuce. Use a trellis for the cucumber, so that they can climb toward the sun.

May

Your bush beans are ready for harvest. Now plant cucumber and corn.

August

You can now harvest your cucumber and corn.

Yearly Crop Rotation 6



Benefits of Parsley

Parsley's potential as a companion plant is best realized when you allow it to flower. Peppers and Cabbage family are vulnerable to worms, aphids and beetles. Parsley flower attracts beneficial insects that prey on these pests. You should avoid growing parsley with onion family and carrots. If you grow lettuce in the same bed, do not place them directly next to each other as parsley may encourage lettuce to seed too soon.

January

Seed sweet pepper.

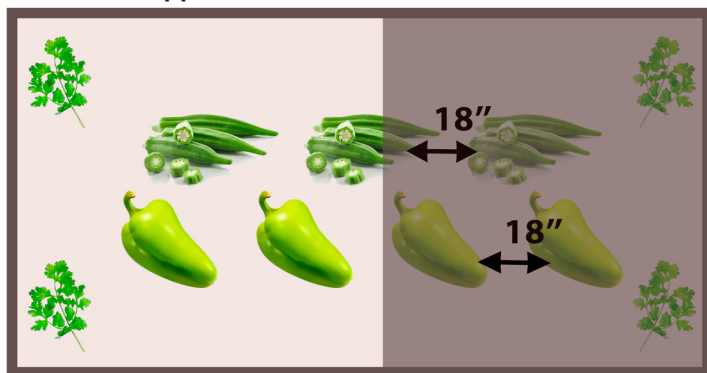
February

Plant sweet pepper and okra.

March

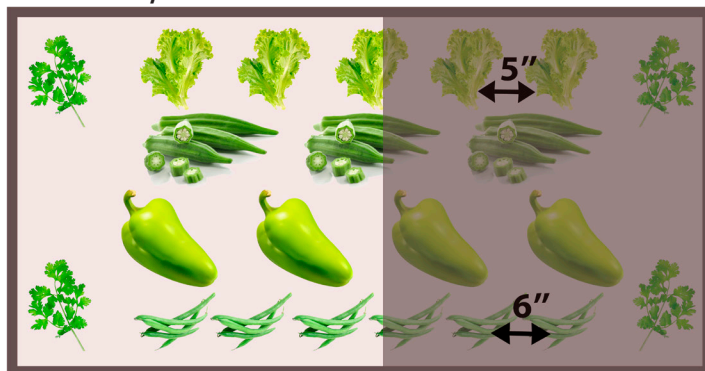
Seed lettuce.

1. Sweet Pepper & Okra



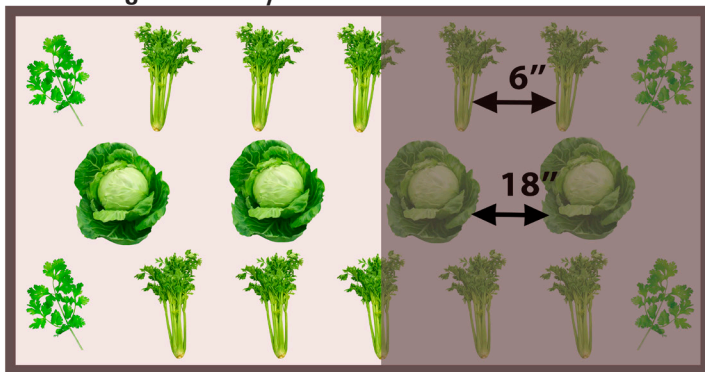
This rotation starts with two heavy-feeders, sweet pepper and okra. Okra can offer a wind shield for the young and more fragile sweet pepper plant. In turn, some okra pests are also deterred by the aroma of sweet pepper. Both of these crops are heavy-feeders; in other words they require a lot of nutrients to grow.

2. Pak Choy & Bush Beans



In the next rotation phase, you leave the heavy-feeders in their place and make use of the remaining space on your bed to maximize the yield you can get by planting bush beans and lettuce. Since both okra and pepper grow upward, you can make use of the lower level by planting crops that require less time on the bed shortly before harvesting. Lettuce and bush beans will grow first shielded, and then flourish when you remove the peppers and okra.

3. Cabbage & Celery



The third rotation phase combines a heavy-feeder, cabbage, and a light-feeder, celery. Celery is effective in repelling cabbage pests worms which may threaten your cabbage crop. Celery roots also create a desirable environment for earth worms. In turn, if in a windy location, the cabbage can protect a young celery shoots which tend to be very fragile.

April

Plant lettuce and bush beans.

May

Harvest the last okra and sweet pepper. Seed cabbage and celery.

June

Your lettuce and bush beans are ready for harvest. Now plant the cabbage and celery.

September

You can now harvest your cabbage and celery.

Planting - Companions & Distances

You are almost at the end of this short guidebook on permaculture gardening. Understanding some basic things about plants, insects and ecosystems will take you far. Look at your garden with curiosity and visit it often so that you start seeing the little changes: development of a chichira from a little pod into a juicy vegetable; your tomatoes changing color from green to red; butterflies flying all around you....

If you want to read more on companion plants, crop rotation, and planting by the moon, some good references, also used when writing this booklet, include:

- **Carrots Love Tomatoes:** Secrets of Companion Planting for Successful Gardening by Louise Riotte
- **A Tropical Guide to Year Round Vegetable Gardening** by Harlan H.D. Attfield
- **Websites:** gardeningknowhow.com; harvesttotable.com; growveg.com; gardeningbythemoon.com

But more importantly: Discuss with your friends and family, exchange experiences and knowledge - and together you will make your home gardens flourish!

**Which plants
do I need to seed
in advance?**

**What are
good planting
distances?**



**Which
plants should
I avoid
growing
together?**

**Which
plants are good
companions?**

**Which plants
can I use for
pest control?**

Companions

Beneficial Plants for Pest Control

Beetroot
(Amaranth Family)

Mint

Broccoli
(Cabbage Family)

Dill, Celery

Bush Beans
(Legume Family)

Marigold, Rosemary,
Nasturtium

Cabbage
(Cabbage Family)

Dill, Rosemary, Thyme,
Marigold, Mint, Nasturtium

Carrots
(Parseley Family)

Nasturtium, Rosemary, Sage

Celery
(Parseley Family)

Chives
(Amaryllis Family)

Collard
(Cabbage Family)

Dill, Sage, Mint, Thyme,
Marigold

Other Good Companions

Avoid Growing With

Bush beans, Carrots, Radishes,
Lettuce, Cabbage

Pole Beans

Spinach, Lettuce, Cucumber,
Beans, Sage

Tomatoes

Cucumber, Corn, Eggplant,
Radish, Tomatoes, Carrots,
Okra

Beans, Celery, Coriander,
Beets

Eggplant, Broccoli, Pepper

Chives, Beans, Radishes,
Tomatoes

Dill, Fennel, Parsley

Beans, Cabbage family,
Cucumber, Tomatoes

Corn, Squash, Pumpkin

Carrots, Broccoli, Cabbage,
Tomatoes

Beans

Cucumber, Celery, Beets,
Bush beans, Chives

Pole Beans

Companions

Beneficial Plants for Pest Control

Corn (<i>Grass Family</i>)	Sunflower, Borage, Dill, Marigolds, Thyme
Cucumber (<i>Gourd Family</i>)	Marigold, Oregano, Dill, Radish
Eggplant (<i>Nightshade Family</i>)	Marigold, Nasturtium
Hot Pepper (<i>Nightshade Family</i>)	Basil, Chive, Marigold, Dill, Parsley, Cilantro
Kale (<i>Cabbage Family</i>)	Cilantro, Dill, Chives, Marigold, Nasturtium
Lettuce (<i>Aster Family</i>)	Chives, Marigold, Mint
Melon (<i>Gourd Family</i>)	Marigold, Nasturtium
Okra (<i>Hibiscus Family</i>)	Sunflower, Basil

Other Good Companions

Avoid Growing With

Beans, Squash, Cucumber, Melon, Lettuce

Tomatoes

Beans, Peas, Lettuce, Corn, Okra, Radishes, Carrots, Beets, Cabbage

Sage, Mint, Melon, Squash

Beans, Lettuce, Pak Choy

Tomatoes

Oregano, Lettuce, Radish, Carrots, Kale

Hot Pepper, Tomatoes, Beans, Carrots

Cabbage Family

Beets, Tomatoes, Carrots, Radishes, Beans, Cucumbers, Corn, Eggplant

Peas, Beans, Cabbage, Broccoli, Cauliflower, Carrots, Kale, Okra, Lettuce

Potato

Lettuce, Radishes, Peppers, Squash, Sweet potatoes

Companions

Beneficial Plants for Pest Control

Pak Choy
(*Cabbage Family*)

Celery, Thyme, Rosemary,
Sage, Coriander, Nasturtium

Peanut
(*Legume Family*)

Rosemary, Marigold

Pole Beans
(*Legume Family*)

Marigold

Pumpkin/Squash
(*Gourd Family*)

Marigold, Nasturtium,
Marjoram

Radish
(*Cabbage Family*)

Chives

New Zealand Spinach
(*Amaranth Family*)

Basil, Marigold

Sweet Pepper
(*Nightshade Family*)

Marigold, Nasturtium, Basil,
Dill, Chives

Tomato
(*Nightshade Family*)

Basil, Chives, Borage, Parsley,
Mint, Nasturtium

Other Good Companions	Avoid Growing With
Beets, Bush Beans, Carrots, Cucumbers	
Beets, Carrots	Pole beans, Corn, Okra
Corn, Squash, Carrots	Chives
Corn, Beans	Potatoes
Cucumber, Squash, Carrots, Lettuce, Peas, Beans	Cabbage, Fennel
Bush beans, Tomatoes, Okra	Corn, Pole beans
Okra, Radishes, Kale, Carrots, Lettuce	Cabbage, Kale
Carrots, Peppers, Spinach, Lettuce, Arugula	Broccoli, Cabbage, Corn, Fennel

Planting Distances

Space between plants (inch/cm)

Beetroot
(Amaranth Family)

3" / 8 cm

Broccoli
(Cabbage Family)

18" / 45 cm

Bush Beans
(Legume Family)

2" / 5 cm

Cabbage
(Cabbage Family)

12" / 30 cm

Carrots
(Parseley Family)

Sprinkle seeds directly on the
bed.

Celery
(Parseley Family)

8" / 20 cm

Chives
(Amaryllis Family)

4" / 10 cm

Collard
(Cabbage Family)

12" / 30 cm

**Space between rows
(inch/cm)**

Additional Information

12" / 30 cm

Seed 3 weeks before planting.

18" / 45 cm

Seed 4 weeks before planting.

20" / 50 cm

Soak in water overnight
before planting.

18" / 45 cm

Seed 6 weeks before planting.

12" / 30 cm

Thin carrots once they sprout so
that the roots have more space
to develop.

12" / 30 cm

Seed 4 weeks before planting.

12" / 30 cm

Can be planted from a cutting.

18" / 45 cm

Seed 4 weeks before planting.

Planting Distances

**Space between plants
(inch/cm)**

Corn
(Grass Family)

12" / 30 cm

Cucumber
(Gourd Family)

12" / 30 cm

Eggplant
(Nightshade Family)

18" / 45 cm

Hot Pepper
(Nightshade Family)

18" / 45 cm

Kale
(Cabbage Family)

12" / 30 cm

Lettuce
(Aster Family)

5" / 14 cm

Melon
(Gourd Family)

18" / 45 cm

Okra
(Hibiscus Family)

18" / 45 cm

**Space between rows
(inch/cm)**

Additional Information

24 " / 60 cm

Corn can be planted directly.

59" / 150 cm

Seed 2 weeks before planting.

30" / 75 cm

Seed 4 weeks before planting.

24" / 60 cm

Seed 5 weeks before planting.

18" / 45 cm

Seed 4 weeks before planting.

12" / 30 cm

Seed 4 weeks before planting.

59" / 150 cm

Melon can be planted directly.

24" / 60 cm

Okra can be planted directly.

Planting Distances

Space between plants (inch/cm)

Pak Choy (<i>Cabbage Family</i>)	10" / 25 cm
Peanut - Bunch (<i>Legume Family</i>)	6" / 15 cm
Pole Beans (<i>Legume Family</i>)	3" / 8 cm
Pumpkin/Squash (<i>Gourd Family</i>)	59" / 150 cm
Radish (<i>Cabbage Family</i>)	Sprinkle seeds directly on the bed.
Spinach - Crawling (<i>Amaranth Family</i>)	8" / 20 cm
Sweet Pepper (<i>Nightshade Family</i>)	12" / 30 cm
Tomato (<i>Nightshade Family</i>)	20" / 50 cm

**Space between rows
(inch/cm)**

Additional Information

18" / 45 cm

Seed 4 weeks before planting.

24" / 60 cm

Soak in water overnight and
plant without the hull.

48" / 120 cm

Soak in water overnight
before planting.

59" / 150 cm

Pumpkin/Squash can be
planted directly.

8" / 20 cm

Thin sprouts 3" / 8 cm apart to
allow the roots to develop.

8" / 20 cm

Seed directly or grow
seedlings 4 weeks before
planting.

24" / 60 cm

Seed 4 weeks before planting.

48" / 120 cm

Seed 4 weeks before planting.



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