

Planting Your Garden



Photo by Sheena Shah

OVERVIEW

LEARNING OBJECTIVE

Gardeners will be able to think through important planting decisions and plant a nutritious, diverse home garden.

DURATION



MATERIALS NEEDED








- Flipchart and markers
- Large sheets of paper. Bring at least a few sheets for each gardener.
- Extra pens or pencils
- Locally available seeds
- Transplants
- String
- Jerry can or watering can
- Mulch
- Inorganic fertilizer (optional)



KEY CONCEPTS

- There is no one way to plan your garden! Garden plans are flexible and meant to guide gardeners.
- Transplanting crops from a nursery into a garden bed can help gardeners make the best use of their garden beds.
- If crops are properly spaced in garden beds, then competition for light and root space is reduced.
- Staggered plantings allow crops to mature at slightly different times and extend the harvest season.
- Intercropping beds with two to three different crops may help gardeners use the bare space in their beds to grow more nutritious vegetables.

TRAINING AGENDA

1	Introduction and warm-up	 DISCUSSION	10 min
2	Developing a garden plan	 DISCUSSION	30 min
3	Transplanting and direct seeding	 DISCUSSION	45 min
4	Spacing and staggering vegetables	 DISCUSSION	30 min
5	Intercropping a garden bed	 DISCUSSION	30 min
6	Planting a nutritious home garden	 PRACTICAL ACTIVITY	1 hour
7	Closing discussion	 DISCUSSION	10 min

1. Introduction and warm-up

Welcome gardeners to the training. Do a brief introduction to today's topic and review the training agenda. You may want to outline the training agenda on your flipchart or board so gardeners can see it when they arrive.

Conduct a warm-up exercise or ice-breaker to make sure all gardeners feel welcome and are ready to fully participate. Suggested warm-up and ice-breaker activities can be found in the Facilitator's Guide: Encouraging Learning through Participant Engagement.

2. Developing a garden plan

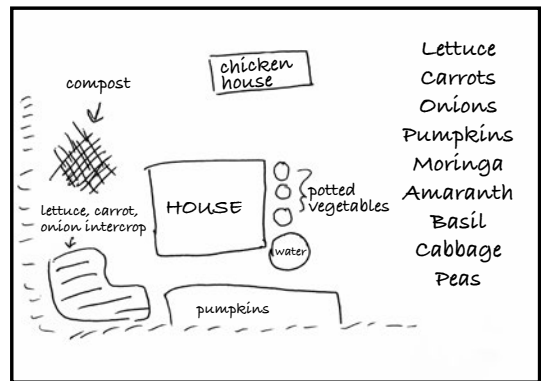
INTERACTIVE DISCUSSION

GOAL OF DISCUSSION: Participants are introduced to the idea of a gardening plan and how it may benefit them.

MATERIALS NEEDED:

- Large sheets of paper. Bring at least a few sheets for each gardener.
- Extra pens or pencils.

1. Ask gardeners why we would want to plan out what goes in our gardens before we plant them. With gardeners, list some of the reasons why we want to think through what we will plant before planting.
2. Tell gardeners that they are going to build a garden plan for themselves. Have gardeners draw a quick map of their garden space either on a large piece of paper or in their notebooks. They should include all the spaces they have available for planting in their map. They can even include spaces they intend to fallow this season because these can be planted with cover crops, covered with cardboard, or left weedy (cut weeds before seeds are produced though).
3. Write out some questions gardeners can ask themselves on your board or flipchart.
 - What does my household like to eat?
 - What do I like to sell?
 - What have I had success growing in the past?
 - What crops grow best during the upcoming season?
4. Split gardeners into groups of two or three and have them discuss the questions, writing down the list of vegetables they brainstormed on one side of their paper. Tell them to decide what they will plant from this list in each bed. They may decide to intercrop multiple vegetables within the same bed, or plant beds with one type of vegetable. They will probably need to make many versions of the map as their ideas change. Each gardener will produce their own map, although they will discuss ideas as a group.



KEY MESSAGES

Benefits of developing a garden plan

- Have all your resources (seeds, compost) together ahead of time or know where you will get them from.
- You can plant your garden in a way that helps you and your household always have foods you like to eat around. For example, you can plant some leafy greens at the beginning of the season and again in the middle of the season to ensure they are always available.
- You can know when you will have extra vegetables ready for harvesting so you can make a plan for how you will use them.
- You can make sure all garden beds are used in the best way possible.







3. Transplanting and direct seeding

INTERACTIVE DISCUSSION

GOAL OF DISCUSSION: Review with gardeners best practices for transferring seedlings from nurseries to garden beds and direct seeding crops.

MATERIALS NEEDED: Flipchart and markers

1. Write "Direct Seeded," "Transplanted," and "Both" at the top of your flipchart and ask gardeners to name crops and place them in the proper column. Root crops should all appear in the "direct seeded" column, but other crops can appear in either the "transplanted" or "both" columns.
2. Focusing first on transplanting, discuss the reasons why a gardener would want to transplant seedlings from a nursery to a garden rather than direct seed.
3. Ask gardeners to share their past experiences transplanting seedlings from nurseries to garden beds. Write down the best practices and recommendations they share and add any best practices that were not mentioned.
4. Next discuss reasons for direct seeding crops.
5. Ask gardeners to share their past experiences with direct seeding crops, first focusing on large seeds like beans and then focusing on small seeds, such as carrots. Write down their best practices and recommendations and add any that were not mentioned.
6. Discuss the importance of thinning small-seeded crops with gardeners. Show gardeners the **Plant Competition Training Aid** and tell them that spacing plants too close together will cause competition, but spacing them too far apart will allow more weeds to grow and waste space in their garden bed.

	❌ INCORRECT	❌ INCORRECT	✅ CORRECT
Seedlings			
Mature plants			
	<i>Plants are too close - competing for resources</i>	<i>Plants are too far apart - wasting space and allowing room for weeds</i>	<i>Plants spaced correctly - small space between mature foliage</i>

Why are some crops transplanted and others direct seeded?

“Transplanting” is when a gardener moves plants from the nursery to a garden bed to finish growing. Seedlings are first grown in a protected, fertile, and well-watered nursery or seed trays. This practice protects young seedlings from being eaten by pests (chickens, slugs, caterpillars) or damaged by heavy rains or wind. The gardener can choose to put the healthy seedlings in the best garden beds in order to improve their yields. The gardener will save on the cost of seeds and not waste garden bed space on seeds that never germinated.

Seven to 8 week-old seedlings, or plants with 4 to 5 leaves, are ready to be transplanted to the garden. Before moving plants, harden them off if they are in containers. **“Hardening off”** is when a gardener prepares a plant for moving to a different environment. Plants need to slowly adapt to an environment that has more sunshine or harsher winds or temperature, or they will suffer. Tender plants can be burned by the sun, the shock of cold or heat, or the wind. If plants change environments too quickly, some may die and others will have their growth set back by a few weeks while they recover and adjust.

The best way to harden plants is to put them outside for just a few hours and then bring them in at night. Each day, increase the number of hours they are exposed to sunshine. After 3 or 4 days, they will be ready for transplanting.

When transplanting, dig up roots with as little disturbance as possible. Keep soil around roots and break up any roots that have started to circle around each other so that roots can easily move vertically downwards. Move seedlings into garden beds as quickly as possible to avoid roots from drying out. Dig a small hole where the seedling will be placed and insert seedling so that it is again covered by soil up to where it was last covered. Gently push down on soil so that roots have good contact with soil and large air pockets are removed. Water transplanted seedlings so that soil settles around roots and roots stay moist.

“Direct seeding” is planting seeds directly into the soil. Some crops, like root crops such as carrots or short-duration crops such as kang kong, should be direct seeded because they do not do well when moved. A gardener may also wish to direct seed into a garden bed because they do not have time to build a nursery and transplant crops.

A rough rule is that seeds should be planted twice as deep as the seed’s width. That means that larger seeds, such as beans, will be covered by around 1 cm of soil, but very small seeds will only need a light dusting of soil to cover them. When planting very small seeds, it helps to mix the seeds with sand in a 1:3 ratio (1 part seed to 3 parts sand) to spread the seeds more evenly. This ratio can be modified after trial and error with different crops. Alternatively, farmers can broadcast very small seeds into a soil covered in 2–4 cm of mulch, such as paddy rice straw, to help distribute seeds evenly.

For garden beds, it is best if seeds are sown in rows rather than broadcast into the soil. This helps to remove weeds more easily, use mulch, and space vegetables so that all available bed space is used. The distance between rows should just allow plants to touch but not crowd each other. If gardeners are intercropping, they may choose to plant a different vegetable in between rows.

In order to reduce competition for each individual plant, the crops need to be thinned once seedlings have established. **“Thinning”** is when a gardener removes some of the baby plants from direct seeded rows to free up space for the remaining plants to mature without crowding each other. To thin, hold the plant between your forefinger and thumb at the soil level. Pull firmly to dislodge the entire plant from the soil by the root. Replace any soil that was removed from the roots of the remaining plants.

Begin thinning when plants are 10 cm tall. Remove the smallest and scrawniest plants from the garden, or those that are growing very close together, so that individual plants are at least a thumb’s-width apart from other plants.

Consider a second thinning when plants look like they will start to crowd each other, but before they actually do. For crops like leafy vegetables and carrots, the removed plants may be large enough to eat even if they are not full size yet.

4. Spacing and staggering vegetables in your garden bed

INTERACTIVE DISCUSSION

GOAL OF DISCUSSION: Gardeners will learn about how to space and stagger vegetables in a garden bed.

MATERIALS NEEDED: Flipchart and markers

1. Discuss that proper plant spacing is important to reduce competition for light, water, and soil nutrients. Referring to the **Plant Competition Training Aid**, show gardeners that plants spaced too closely together can compete both above and below ground.
2. Ask gardeners how they would reduce competition for transplanted crops. How do they know how far apart to put seedlings?
3. Ask gardeners how they would reduce competition for direct-seeded crops. Discuss the strategies they would use for both large and small seeds.
4. Introduce the concept of triangle spacing and show gardeners the **Triangle Spacing Training Aid**.
5. Ask how many gardeners have ever sowed their vegetables slowly throughout the season to extend their harvest season and avoid situations where everything is ready for harvest at the same time. This strategy is known as "staggered planting." Encourage gardeners that have successfully extended their harvest season to discuss the strategy they used. Discuss specific examples of staggered planting, such as sowing half your cabbage seeds early in the season and half around two weeks later.

KEY MESSAGES

Competition between plants

Plants all need light, water, air, and nutrients from the soil. When plants are growing too close together, they can block each other from freely accessing these elements. When plants are competing with each other for light, water, air, and nutrients, their growth will be slowed down and plants will be stunted. However, if plants are placed too far apart from each other, weeds will grow in the spaces between plants and wind may blow plants over more easily. Bed space is also wasted. Our goal is to have a full canopy: no empty space between fully mature crops, but also no crowding or overlap.

Competition between plants can be reduced by carefully selecting the right **distance between rows** and **distance between plants within a row** so that each bed has a full canopy.

To determine the distance between rows and plants within a row, gardeners should draw a loose circle in the dirt around a healthy, fully grown crop. Be sure to include the full plant and add some additional space so the circle is not drawn too tightly. Measure the diameter of the circle with a stick, string, or measuring tape. If you are triangle planting, this will also be the "between-plant" spacing.

The benefits of triangle planting

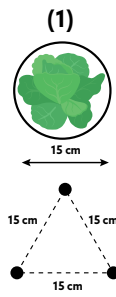
Triangle planting fully fills both the above-ground and below-ground space in the garden bed. Above ground, plant leaves and branches will fill all the available space, capturing more light and filling the canopy more quickly. As the canopy fills, weed pressure will be reduced and yields will increase. Below ground, plant roots will fill all the available space in the soil, capturing more water and nutrients.



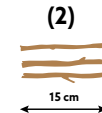
HOW TO

TRIANGLE PLANT A GARDEN BED

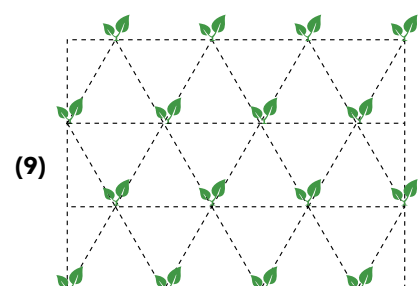
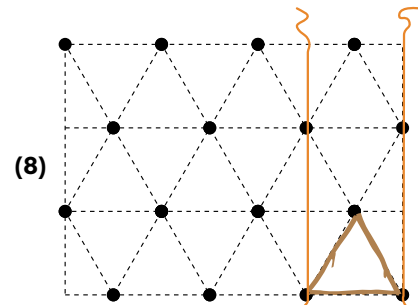
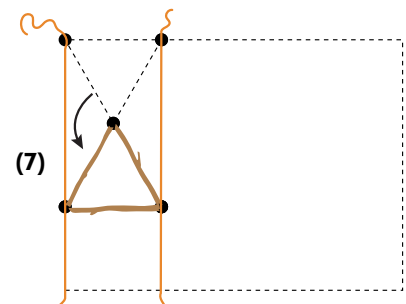
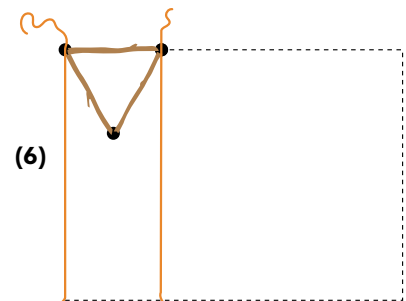
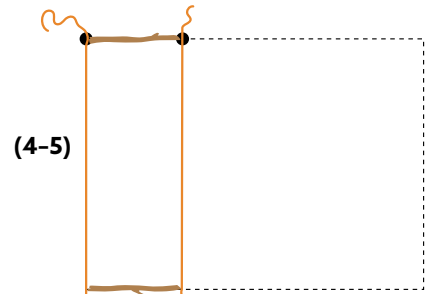
1. Determine the correct between-plant spacing for your crop. To determine the distance between rows and plants within a row, gardeners should draw a loose circle in the dirt around a healthy, fully grown crop. Be sure to include the full plant and add some additional space so the circle is not drawn too tightly. Measure the diameter of the circle with a stick, string, or measuring tape.



2. Cut a straight stick into three smaller sticks that are all the length of the between-plant spacing.



3. Place one stick along the narrow end of the planting bed to mark starting points of the first two rows.
4. Use two strings to mark out the lines for these rows. Confirm that the lines are straight by placing a second stick in between the strings at the other end of the bed.
5. At the first stick, push your thumb into the soil at either end of the stick to mark two planting holes.
6. Use the two other sticks to form a triangle between these two holes and a point further into the bed. Push your thumb into the soil at that point to form a new hole. Confirm with the sticks that all three sides of the triangle are the same length.
7. Flip two sticks outward so that they touch the two strings. Place the third stick at the ends of these sticks so that it forms a new triangle further into the bed. Push your thumb into the soil to mark the new planting holes formed by this triangle.
8. Continue moving the sticks until you reach the end of the bed. Start new rows and repeat the process until all holes have been dug. After the whole bed is marked, the pattern should appear as many small triangles.
9. Transplanted seedlings or large-seeded crops can be directly sown into these planting holes.

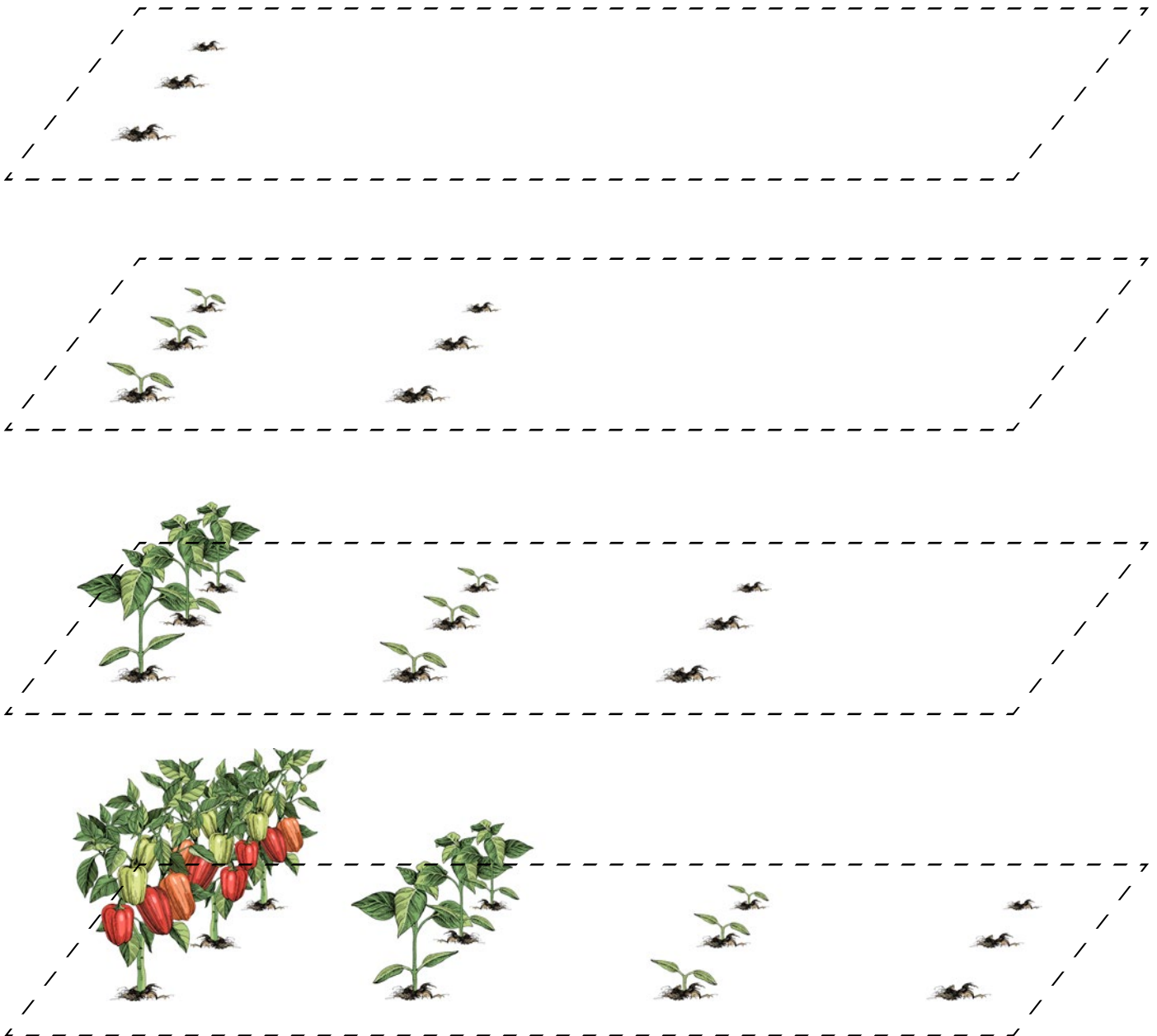


Using staggered planting techniques to lengthen harvest seasons

It is easy at the beginning of the season to plant a full garden and imagine all the beautiful produce you will have in the future. But too often this produce cannot be used by the household and surplus vegetables go to waste.

One method of lengthening the harvest season is to continuously plant new seeds and transplants so that crops are maturing at slightly different times. Encourage gardeners to only experiment with staggering the planting of 1-2 crops if it is their first time. This may mean planting only one row of a vegetable during the first planting, with the expectation that the second row will be planted 1-2 weeks later. Or it could mean starting seedlings in a nursery on two different occasions so that crops are moved to the field at different times. While beds are waiting for a second planting, be sure to keep them moist and covered with mulch.

It is best to try this technique with quick-growing vegetables first to ensure that plantings mature within the growing season.



5. Intercropping a garden bed

INTERACTIVE DISCUSSION (30 MINS)

GOAL OF DISCUSSION: Gardeners will think about how vegetables can be effectively intercropped into a garden bed.

MATERIALS NEEDED: Flipchart and markers

1. Ask gardeners to discuss the pros and cons of planting multiple vegetables in one bed versus only one type of vegetable per bed.
2. Explain to gardeners that a well-selected combination of vegetables can be used to grow more vegetables from the same garden bed.
3. Draw a vertical line on your flipchart and write "Quick" at the top of one column and "Slow" at the top of the other column. Create a list of quick- and slow-growing vegetables with gardeners.
4. Ask gardeners to name combinations of quick and slow growing vegetables that they think would work well together. Have gardeners explain why they think this is a good combination and identify any points in the season when the two crops could be competing with each other for root or canopy space. How could they prevent this competition?
5. Repeat the exercise with "tall and thin" and "short and bushy" vegetables.
6. Have gardeners vote on the top three crop combinations they wish to try.

KEY MESSAGES

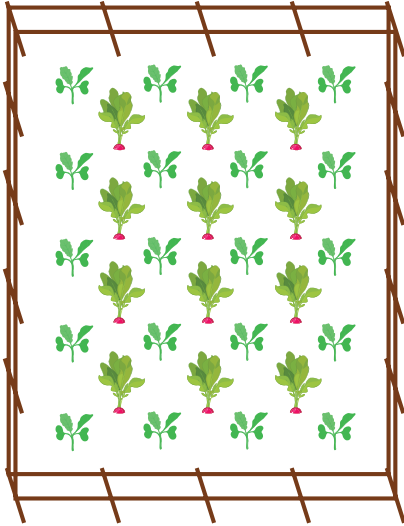
Intercropping means growing two or more vegetables in the same bed at the same time. It is a great way to use garden space more effectively and keep garden beds full of vegetables. There is no one way to intercrop! Gardeners should be creative and use trial and error to find combinations that work for them.

	Intercropping	One vegetable per bed
Benefits	<ul style="list-style-type: none"> • Allows gardeners to make use of empty bed space as slow-growing crops mature • Allows gardeners to harvest a diversity of vegetables • Can reduce the need for weeding or mulch because beds are covered with crops • Can confuse insect pests who are looking food • Older plants can help younger plants who may need some shade to get established 	<ul style="list-style-type: none"> • Requires less planning • Easy to do triangle planting
Challenges	<ul style="list-style-type: none"> • Requires more planning • Takes trial and error until good combinations are found. If done poorly, both crops can suffer because they are crowding each other out. 	<ul style="list-style-type: none"> • Can have bare space in garden beds as slow-growing crops mature

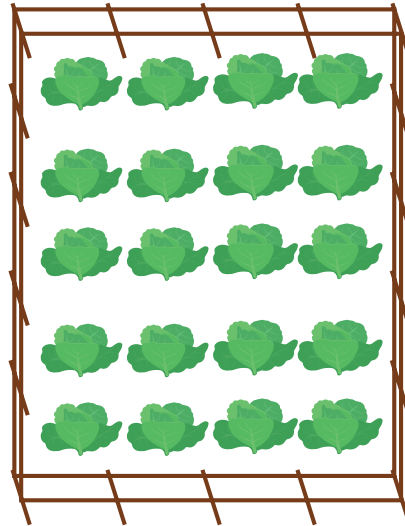
What vegetables can be intercropped together in a bed?

QUICK-GROWING VEGETABLES TOGETHER WITH SLOW-GROWING VEGETABLES

Quick-growing vegetables (lettuces and radishes) can be planted in between rows of a slow-growing vegetable (cabbage, tomatoes, leeks, beets, onions, or garlic) and harvested before slow-growing vegetables mature and fill the canopy.



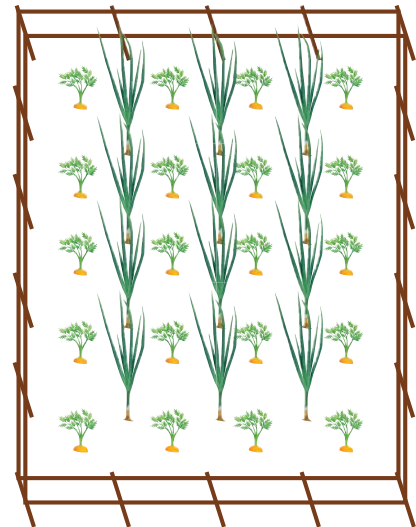
Slow-growing cabbage intercropped with quick-growing radishes. Radishes fill bed space between cabbages as they grow.



Radishes harvested before cabbages mature and fill bed space.

VEGETABLES OF DIFFERENT HEIGHTS AND BUSHINESS

Combine tall, thin crops (leeks, onions, garlic, climbing beans) with short, bushy crops (radishes, lettuce, carrots, beets, spinach, parsley). Plants that grow to be the same height and bushiness do not intercrop well because they will compete for sunlight and root space.



Tall, thin onions intercropped with bushy carrots. Taproots of carrots will reach soil nutrients below onion bulbs.

Companion Planting

Bad companion planting is two crops planted close together that lower the yields of each other. For example, the two crops may have the same pest so both crops are easily infested. If a gardener recognizes that two crops are negatively affecting each other, they should plant other crops in between these two crops or separate the two garden beds by at least 50 cm.

Good companion planting is planting two crops together who help each other grow. For example, some plants may attract beneficial insects when they flower, such as cilantro, and these insects feed on the pests that harm a neighboring crop, such as aphids that are attracted to kale and other cruciferous plants.

6. Planting a nutritious home garden

PRACTICAL ACTIVITY

GOAL OF ACTIVITY: Gardeners will apply their knowledge of direct seeding and transplanting to plant a garden with single-vegetable beds and intercropped beds.

MATERIALS NEEDED:

- Flipchart and markers
 - Locally available seeds
 - Transplants
 - String
 - Jerry can or watering can
 - Mulch
 - Inorganic fertilizer (optional)
-

1. Explain to gardeners which garden beds will be intercropped and which will be planted with a single vegetable.
2. Gather gardeners around a bed that will be intercropped. Use your flipchart and markers to draw a picture of the garden at maturity. Explain your reasoning for why you selected these plants and this way of intercropping. Use a stick to show gardeners where plants will go.
3. Have gardeners sow seeds and plant transplants in the intercropped beds.
4. Have gardeners decide together what will be planted in the remaining beds. Use triangle spacing to determine the width between beds and between planting holes for each vegetable type.
5. Have gardeners discuss if they will use staggered planting for any of the beds so that they can prolong their harvest period. They may also wish to discuss what crops would be best to plant in the following season to practice crop rotation principles.
6. Water garden and cover with mulch before leaving.

KEY MESSAGES

If using inorganic fertilizer, be sure to apply it correctly. It is very important that the seeds or young roots not directly touch the fertilizer. It is very easy to apply too much fertilizer, so do not 'top-up' your application. Inorganic fertilizer should always be applied into beds that have been enriched organic material, such as compost, and fertilizer should be covered with soil after application.

If direct seeding, draw two lines 7-10 cm away from the planting line on either side. Sprinkle inorganic fertilizer in the lines at the same rate as you would apply seeds. Pinch the line to cover the fertilizer with soil.

If transplanting seedlings, draw a ring that is 7-10 cm away from the transplant. Sprinkle half a bottle cap of fertilizer in the ring and cover with soil.

7. Closing discussion

Review the variety of vegetables that were planted in the garden, discuss when they can be expected to be harvested, and note how a diverse garden will provide households with a steady supply of vegetables to harvest.

Planting Your Nursery



Photo by Sheena Shah



Photo by Sheena Shah

OVERVIEW

LEARNING OBJECTIVE

Gardeners will learn about and practice planting a nursery.

DURATION



MATERIALS NEEDED

- Flipchart and markers
- Sand, coconut coir, or rice hulls for mixing with nursery soil
- 3 buckets good quality soil or well-prepared compost
- Seeds
- Fencing material
- Netting to protect seeds and young seedlings
- Tools for digging a garden bed
- Small containers with drainage holes in the bottom where gardeners can start seedlings (can also be fashioned from large leaves)



KEY CONCEPTS

- Plant nurseries are well-protected small beds or containers to grow young seedlings before transferring them to our garden beds.
- Nurseries can be used with almost any vegetable crop except root vegetables.
- Nurseries should always be well watered, protected from pests, and have loose, sandy soil so it is easy for roots to grow.

TRAINING AGENDA

1	Introduction and warm-up	DISCUSSION	10 min
2	How do we build a nursery?	DISCUSSION	40 min
3	Build a nursery	PRACTICAL ACTIVITY	40 min
7	Closing discussion	DISCUSSION	10 min

1. Introduction and warm-up

Welcome gardeners to the training. Do a brief introduction to today's topic and review the training agenda. You may want to outline the training agenda on your flipchart or board so gardeners can see it when they arrive.

Conduct a warm-up exercise or ice-breaker to make sure all gardeners feel welcome and are ready to fully participate. Suggested warm-up and ice-breaker activities can be found in the Facilitator's Guide: Encouraging Learning through Participant Engagement.

2. How do we build a nursery?

INTERACTIVE DISCUSSION

GOAL OF DISCUSSION: To share with participants the key components of an effective nursery and how to build one.

FACILITATOR PREPARATION: Select a training site where gardeners can have a discussion and then move to a site where gardeners can establish a plant nursery.

MATERIALS NEEDED: Flipchart and markers

1. Tell gardeners that plant nurseries are places where we can grow young seedlings and keep them protected before we move them into our garden beds.
2. Review the reasons why we would want to use a nursery with gardeners.
3. Ask gardeners to share their past experiences of using a nursery. Write down on your flipchart or board the recommendations gardeners have for creating and using a nursery.
4. Discuss the best practices for building a nursery with gardeners.



KEY MESSAGES

Plant nurseries can help us...

- ... protect young seedlings from being eaten by pests.
- ...protect young seedlings from being damaged by heavy rains or wind.
- ... select strong, healthy seedlings to grow in our garden beds.
- ... not waste garden bed space on seeds that do not germinate.
- ... not waste expensive seeds.
- ...quickly replant garden beds with mature plants after a harvest. This helps us always have vegetables available to eat!

How should we build a good nursery?

<p>If using containers or seed trays...</p> <ul style="list-style-type: none">• Select plastic or wood containers with good drainage holes in the bottom. These can also be made from large leaves. Select larger containers for large seeds or seedlings that will be in containers >20 days. Select small containers for small seeds or seedlings that will be in containers for <20 days.• Fill containers with light, fluffy soil or compost that is mixed with some sand because the soil in containers can easily become compacted.• Sprinkle enough seeds in the container so that 2-3 will germinate. The number of seeds you use will vary depending on how many seeds you expect to germinate and the price of the seed.• Cover seeds with the appropriate amount of soil.• Find a site to keep containers where it is sunny most of the day and it will be easy to water plants 1-2 times a day depending on how hot it is. The surface of the soil should always be moist to the touch.• Keep containers protected from pests and weather.	<p>If using a fertile place close to your household...</p> <ul style="list-style-type: none">• Select a site that has loose, fluffy soil. If possible, mix sand into the top layer of the soil. A banana stem, stones, or wooden boards can be used to make a raised plot.• The nursery site should be sunny most of the day and protected with a small fence or net so that seedlings are safe from pests, birds, and farm animals.• Mark out which sections of the site will be planted with which vegetable seeds.• Sow seeds• Cover seeds with the appropriate amount of soil.• Keep seeds well-watered and protected. This may involve watering seeds 1-2 times a day depending on how hot it is. The surface of the soil should always be moist to the touch.
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Soil media for the nursery

- Seeds already contain all the nutrients they need to start growing. Many vegetables do not start using nutrients from the soil until one week after they germinate when they start using a very small amount. It is more important for young plants to grow big, strong root systems that will feed them later on in life than it is for them to receive nutrients now. For this reason, our nurseries should have loose, airy soil that does not inhibit roots from growing. Mixing fertile soil with sand in a 1:1 ratio is ideal.
- A raised bed can be created to keep the sandy soil contained to one area.

3. Build a nursery

PRACTICAL ACTIVITY

GOAL OF ACTIVITY: Gardeners will apply their knowledge of starting a plant nursery by building a small nursery using both a garden bed and containers.

MATERIALS NEEDED:

- Sand, coconut coir, or rice hulls for mixing with nursery soil
- 3 buckets good quality soil or well-prepared compost
- Seeds
- Fencing material
- Netting to protect seeds and young seedlings
- Tools for digging a garden bed
- Small containers with drainage holes in the bottom where gardeners can start seedlings

1. Have gardeners select a site to prepare as a nursery. Discuss with gardeners how they will keep the seedlings protected from pests and harsh weather and how they will access the water they need for the nursery.
2. Prepare a small garden bed as the nursery site, making sure to create a very fine soil tilth in the top 20 cm of soil. Use your hands to break up any large clumps of soil. Mix sand or other media into the top 10 cm of the soil. The bed can be raised by adding rocks, banana stems, or wooden boards to the bed borders.
3. Sow seeds and erect fence and/or netting around the planted area.
4. Have gardeners also prepare containers to grow seedlings so they experience both methods.
5. Make sure all seeds are well watered and protected from pests and heavy weather before leaving the site.



4. Closing discussion

Ask gardeners to summarize their key insights around building a nursery.