Growing Your Own Food at Home in Salisbury Series

Pack D Notes 2 PROPAGATION FROM SEED

Growing plants from seed is easy, enjoyable and cost effective. Seeds are cheaper than seedlings and can be planted as you need them over a season helping prevent a glut of produce at once. The selection of varieties to grow from seed is much greater than the seedlings available in nurseries. And many plants develop deeper root structures and healthier growth when sown directly into the garden bed.

Sources of seed

Growing plants from seed is easy, enjoyable and cost effective. Seeds are cheaper than seedlings and can be sourced through

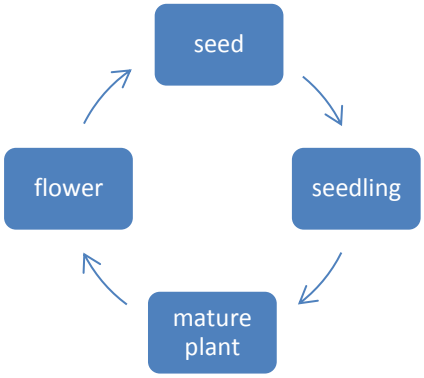
- Local- your and friend's garden and Community Gardens
- Regional- Seed Saver groups and other garden groups in SA
- National- Local garden centres, seed companies and online

Locally grown seed may perform better than seeds of the same plant grown in a completely different climate such as tropical Australia. Saving seed and building up a seed bank to share seed locally has many benefits for both you and the community.

Background Information

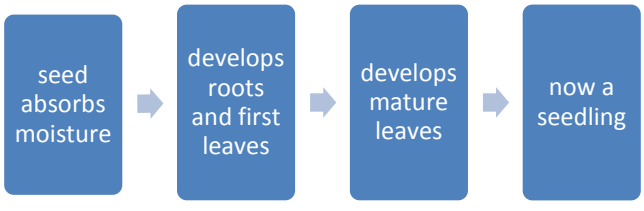
Plant growing cycle

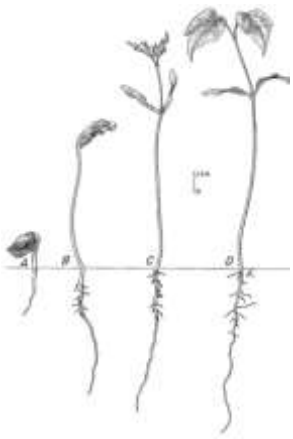
Plants start with a seed, which becomes a seedling that grows to a mature plant which flowers and then produces more seed.



Seeds store just enough nutrients to produce the first leaves and roots for it to grow into a seedling. A developing seedling needs to establish roots in the ground quickly to be able gain water and nutrients from the soil. These roots also hold it in place so wind and other factors that disturb the soil don't move it around. Plants need to stay put to grow and this is one of the distinguishing aspects of a plant – it can't just get up and walk away!

Plants use sunlight to make its energy (this process is called photosynthesis), and an emerging seedling needs to establish leaves to be able to produce food for itself.





http://commons.wikimedia.org/wiki/File:Acer_seedling_drawing.png

Growing seeds into plants

Seed germination requirements

There are particular environmental conditions that need to be met for seeds to germinate. These vary between plants and include the right:

- Depth of seed in the soil
- Moisture level
- Temperature of soil
- Freshness of seed

Depth of seed in the soil

For a planted seed to become a seedling it needs to be at the right depth. Too shallow and it may be blown or moved away. Too deep and it uses all its resources in trying to get the first leaves up to the sunlight, is unable to and is unlikely to survive.

Seeds are best planted at twice the depth of their size.

Plant seeds twice the depth of their size
(width if not round)

Small seeds can be distributed along a shallow furrow (a rill) or lightly sprinkled on the soil and covered with a fine layer of soil or coconut fibre. Larger seed can be planted individually.

Moisture-watering

Seeds require contact with friable/open soil and a moist environment to germinate. This allows moisture from the soil to transfer to the seed so it can send out its first leaves and roots. Always water the soil before and after sowing.

Water with a fine spray every one to two days in cooler weather and once or twice a day in warmer weather. Always check soil moisture before watering. Overwatering or water logged soil may lead to 'damping off' which is a fungal condition that leads to the collapse of young seedlings. Use dilute worm juice and worm castings will help prevent this. To check whether the soil is moist, place your index finger in the soil to its full depth. If it is moist the soil will look dark and stick to your finger.

When you are growing seedlings in punnets, the type of environment the punnets are positioned in needs to be considered. Hot and/or windy days can lead to increased evaporation and dry the soil out, therefore risking the survival of the developing seedlings. In summer, placing them in a deep foam box can offer them shelter from sun and wind. Placing them in a shallow foam box and covering with clear plastic can help retain heat in winter.

Temperature of soil for germination

Plants germinate at set temperature ranges- they will remain dormant until the temperature is right. Sowing at the right time of year will increase germination rate. This information is on the seed packet. Examples, Solanums which includes tomatoes, capsicums, chillies and eggplants all need warm temperatures above 20 degrees to germinate. They also vary in the time it takes to germinate - anywhere from a few days up to a few weeks, depending on temperature. Observe what is germinating in your garden to give an indication of soil temperature.

Soil Temperature for Germination			
Cool Soil 10°C	**Mild Soil 12°C**	**Warm Soil 15°C**	**Very Warm Soil 18°C**
broad beans	beetroot	beans	capsicum
broccoli	cabbage	corn	chilli
Brussels sprouts	cauliflower	cucumber	eggplant
garlic	celery	okra	peanut
kale	fennel	pumpkin	rockmelon
leek	lettuce	summer squash	watermelon
onions	parsnip	tomato	
pea	potato	zucchini	
radish	rocket		
spinach	salad greens		
spring onion	silverbeet		
strawberry			
turnip			

Freshness

It is important to use fresh, healthy seed as they lose their ability to germinate over time and vary in the duration that they remain at their peak viability. Check the Use By Date (Sow Before or Sow By) of packets. For some plants, such as pumpkin, where you don't need many plants, often you can't use all the seed in the packet before the 'best use by date' and waste them. This is good motivation for swapping seeds with friends, or saving your own seeds.

Always store seed out of the sunlight, in a cool dry place. Store in sealed container, with silica gel to absorb moisture and stop them from decomposing. Save gel packets from vitamin containers.

- Short life of 1-2 years: leek, onion, parsley, parsnip, sweet corn, radish
- Medium life of 3-5 years: asparagus, beetroot, cabbage, carrot, capsicum, cauliflower, celery, lettuce, peas, spinach, turnip, watermelon
- Long life- more than 5 years: cucumber, eggplant, tomato, rockmelon

If saving your own seeds, the best reference is The Seed Savers Handbook by Michel and Jude Fanton (www.seedsavers.net).

Sowing seeds

Sowing of seeds can be done by direct sowing into the area where the plants will grow, or sowing in punnets/seed trays/pots and transplanted when the seedlings are established. **Always use healthy seeds** – full sized not chipped, nibbled or broken.

Pre-Treatment

Seeds with a hard coating can be soaked in water to hasten and improve germination. Use warm diluted worm juice or water. Pre-soak larger seeds such as zucchini, pumpkin, beans, peas and corn for a day (24 hours) before sowing.

Direct Sowing

Some plants don't respond well to being transplanted and are best being sown directly where they will grow. Examples are root vegetables and others with tap roots. Direct sowing reduces shock and potential damage of the seeding when transplanting.

Direct sown seeds usually flower and fruit earlier, and develop deep roots earlier which can help the plant to handle heat and water stress better. However, it does mean the beds will be occupied for longer, weed and pest control will need to be provided for the seedlings. Protection from birds and rodents can be given by placing fine netting or shade cloth over the bed.

Vegetables For Direct Sow	
beans	mustard greens
beetroot carrots	parsnips
Brassicas – boy choy, broccoli, Brussel sprouts, cabbage, cauliflower, rocket, pak choy	potatoes
carrots	pumpkin
celery	peas
coriander	radish
corn	rockmelon
cucumber	silverbeet
fennel	spinach
garlic	watermelon
lettuce	zucchini

Plants with large seeds such as peas, beans, pumpkin, squash, cucumber, melons and corn. Exceptions can be made with summer growing crops that require warmth such as pumpkin, squash (zucchini), melons and gourds. They can be planted singly in pots and planted out in September/October when the nights warm up

Fast growing Brassicas such as Bok Choy and Pak Choy are best direct sown. We recommend also direct sowing most of the other Brassicas such as cabbage, cauliflower, broccoli, though they can be grown as seedlings in punnets. If sowing in punnets it is best to transplant them by the four leaf stage.

Direct sowing in ground method

Prepare the garden bed with free draining and moist soil

1) Select healthy seeds
2) Remove weeds
3) Rake back any mulch
4) Rake the soil level. Soil should be moist. Small seeds need a fine even soil to ensure soil seed contact to germinate. Larger seeds don't need this and potatoes are fine in a rougher surface
5) Mark out where the seeds will be planted. A furrow for plants that can grow close together or drill holes with the correct spacing for larger seeds, or randomly scattered

Plant the seed

1) Mix fine seeds, such as carrot, with fine sand for more even distribution. Fine seeds will need to be covered with fine soil
2) Plant the seed twice as deep as the seed is wide
3) Fill the holes/or pull back soil over furrows.
4) The back of a rake is useful for this. If using a trellis place in now or when seedling are very small and have not developed an extensive root system
5) Water with a fine mist
6) Label with the seed name and date
7) Water with a fine spray every one to two days in cooler weather and once or twice a day in warmer weather. Always check soil moisture before watering- place your index finger in the soil to its full depth. .

Protection of direct sown seedlings

Cutworm, millipedes, slaters, earwigs, slugs, snails and caterpillars (especially cabbage whites on Brassicas) all feed on tender young seedlings. They can decimate a crop overnight. To deal with pests:

- **Remove Habitat** Coarse mulch will provide a refuge for many of these pests so removing mulch will help. Rocks and logs also provide refuge for pests and predators. Check these regularly and remove any residing snails and slugs
- **Provide physical barriers** over the seedlings can help protect them such as: plastic containers **with** the bottoms removed for slugs, slaters and snails; or fine netting can protect from cabbage white butterflies
- **Traps** Sugar or stale beer traps can reduce snail and slug numbers. Vegetable/fish oil traps can be used for earwigs and millipedes. Half shells of melons and citrus can be left out to collect salters, earwigs and millipedes. Collect then dispose of. Earwigs are also attracted to dry traps, pots filled with scrunched up newspaper, pipes etc. that can be placed around the garden
- **Cloches** are clear covers that warm the soil and protect seedlings. They can be individual such as clear bottles or cover an area with frame and plastic.

Sowing in containers to transplant later

This method involves sowing the seeds, caring for them until they have established a root system and mature leaves, and then transplanting them into your garden. Some plants you may wish to transplant into a larger pot and grow them taller before planting out. Tomatoes are often done this way to get an early start, and a large plant can be planted out when the soil is warm enough, generally in October.

Vegetables for Transplanting	
basil	eggplant
broccoli	leeks
Brussels sprouts	onion
cabbage	parsley
capsicum	spring onion
chilli	tomato
celery	turnip
cauliflower	

Containers

Anything that holds the soil for long enough for seedlings to establish and has good drainage can be used. Use clean and sterilized recycled seedling trays or pots, plastic food containers and milk cartons with holes in the bottom or purchase biodegradable fibre pots.

Bleach sterilization method for containers

1) Scrub off all the old soil
2) Mix 1 part bleach and 10 parts cold water in a 20 litre bucket. Place pots of any kind and size into the bleach solution in the bucket and soak for 30 minutes
3) Remove the pots from the bleach solution and rinse them completely with garden hose
4) Leave the pots to dry completely; this may take a few days if they are clay pots. As the pots dry any remaining bleach residue will dissipate naturally

Seed raising soil

Use quality moist, sieved potting mix or seed raising mix. It needs to be clean, free draining and moist to start with. Potting soil can be too rich in nutrients or contain too much large material which prevents seed-to-soil contact. Special seed raising mix can be purchased from garden suppliers.

You can make your own seed raising mix by using any of the combinations listed below"

- sifted potting mix or compost - growing in the fine material
- 50:50 coco peat and perlite
- equal parts sifted soil/coco peat/perlite or vermiculate
- worm castings

Seed raising mix

Standard potting mix

Fine material is necessary for soil seed contact.

Seed rising mix can be bought. Or make your own by sifting potting mix and growing in the fine material.

vermiculite

perlite

coco peat

50:50 coco peat : perlite

Composted chicken manure

Compost

A small amount of fertilser can be added once the seedlings have appeared.

Sowing seeds in punnets/pots

- Select healthy seed- full sized, no chips or breaks
- Fill the container, leaving ½ cm from the top, with slightly moist seed growing mix
- Tap the container to settle the mix (don't press the soil by hand)
- Sprinkle 1-2 mm of worm casts (if available)
- Make small holes for the seed with a chopstick or similar instrument
- Sow the seeds evenly
- Cover the seed with a thin layer of seed growing mix/coconut fibre/ sieved soil
- Water with a fine mist, (a use spray bottle) being careful not to wash the seeds away.
- Label with the seed name and date

Sow in seed raise mix and cover with finely sifted potting mix in shallow wicking poly boxes, which are great in summer

50:50 coco peat : perlite??
Excellent mix for summer

Position and care for seedlings

Store the trays/pots of seedlings in the sunlight with shelter from winds, animals and birds. In hot weather cover the punnets/pot/tray with shade cloth and keep them moist. In cold weather place the punnets/pots/trays in a propagation unit or heated frame. A simple unit can be made with a recycled polystyrene vegetable container from the green grocer with clear plastic on top. When the second set of leaves has developed feed with a weak dilution of compost tea/worm juice/Seasol.
For information on planting out seedlings refer to Pack D Notes 3

Complied by Shannan Davis
Garden Coordinator
September, 2020
8406 8525