

GREENHOUSE GARDENING

For the home gardener, greenhouses can be a boon especially in northern climates where they can be used year-round, even when not heated.

There are myriad factors to consider when opting for a greenhouse:

- size and location, which may be dictated by the space available
- air, layout, light, nutrients, soil and water



LOCATION:

- Choose a spot with good drainage and as many sunny hours as possible. With a southern exposure, shade cloth may be needed to reduce summer heat.
- Don't be limited by shape; anything goes. Greenhouses can be lean-to's tucked into small spaces or attached to the end of the house, or free-standing of any size.
- If light is an issue, grow lights are always an option.

TEMPERATURE:

- A minimum-maximum thermometer is helpful for monitoring temperature fluctuations
- In *winter*, be prepared with extra roof support in case of heavy snow. Cut supporting 2 x 4s so that they reach the peak of the greenhouse from the ground.
- In *summer*, greenhouses need to be ventilated to help regulate the temperature:
 - o If need be, remove every second pane of glass and use a fan to correct air circulation. Consider solar greenhouse fans like those sold for boats.
 - o Used in conjunction with ventilation to regulate summer heat, 40% shade cloth placed on the outside of the greenhouse roof before heat hits the glass can prevent scorching and sterilization of blossoms (around 35°C the pollen on tomatoes goes sterile).
 - o Ideal summer temperatures range between 29°C and 31°C.



WHAT TO GROW:

Greenhouses extend the growing season as well as the type of plants grown. Yet, the first growing choice of most home greenhouse gardeners is fruits and vegetables. But beware: many plants in the Brassicaceae family — Brussels sprouts, broccoli, cabbage, cauliflower, kale, mustard, etc. — don't do well long-term in greenhouses. These can be planted outside as they will winter over.

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Greenhouses provide the perfect environment for:

- propagating seeds,
- hardening off vegetable starts sooner than the outdoors allows,
- getting earlier harvests of tender crops, such as cucumbers, eggplants, French beans, peppers and tomatoes,
- trying more exotic, heat-loving crops such as melons, okra and sweet potatoes.

Narrow the options by growing what you love, but be sure to research what conditions, temperatures and moisture each type of plant requires.

FOOD CROPS

Pollination:

Some EASY food crops to grow in a greenhouse include lettuce, onions, peas, potatoes, radishes, strawberries and tomatoes. Before starting, determine how each plant type is pollinated. For instance, lemons, strawberries and tomatoes grow without insect pollination but fruit better with insects or when hand pollinated.



Some plants (parthenocarpic) make fruit without pollination. Cucumbers, such as Corinto, Diva, Iznik, Lisboa F-1, Nokya, Salad Bush and Sweet Success, do not need pollination of any kind. Specialized, warm temperature greenhouse cucumber varieties — Excelsior, Picolino and Quirk — are also available.

Cold Tolerance:

Some plants need short days and a cool climate, which on Vancouver Island means September to April in a cool greenhouse in late fall, winter or early spring. However, once cool, short-season plants get big enough to produce a bumper harvest, they suddenly bolt, getting tall, flowering and setting seed as the days get longer in spring.

For spinach, newer cold-tolerant varieties — Corvair and Space — depend less on short days so are slower to bolt, while others, such as Esalade and Olympia, tolerate heat better than other varieties. The general rule of thumb for spinach is to avoid bright sunlight. It may not grow a lot in winter but spinach seeded in August and overwintered in the greenhouse has a head start and will begin to grow in March as the amount of daylight lengthens.

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Fertilizing:

In early spring, cold soils in an unheated greenhouse mean that microbes that release nitrogen — an essential nutrient — to the plants do not function. Certain products like fish or seed meal need warm soil before they trigger green plant growth. However, water-soluble fertilizers, such as BioFish 3-2-1 or FertiCare Kick Starter, are instantly available because they can be sprayed on leaves for faster uptake, therefore skirting the problem of cold soils. Heating mats or a space heater can also be used.

Growing Citrus:

Even in the dead of winter, the greenhouse can be a plant sanctuary. Acidic citrus, such as lemon (Meyer), lime or yuzu, can grow year-round, even in an unheated greenhouse — either in containers or in the ground — wrapped in remay and strung with old-fashioned (7-watt) Christmas lights for warmth on particularly cold nights, generally between November and April. Plugging the lights into a thermostat set at 0°C eliminates the need to turn the lights on and off when temperatures drop.

WATER

Not every plant needs the same volume or frequency of water, so it's important to know each plant's watering requirements. Overwatering occurs when watering is too frequent to allow the soil to drain. A drip system on a timer regulates greater or smaller streams of water straight to pots or flat ground and avoids the leaves, which when watered can contribute to disease development. Irrigation used with a timer delivers consistent moisture, even at times when the garden is unattended.

PLANNING

Measure out your greenhouse beds and floor space for growbags, which can be put in the centre of the greenhouse. Each growbag has room for 3 plants. Depending on what is planted in them, a frame may be necessary to support those plants. For instance, cherry tomatoes can be grown up 8-foot bamboo poles with crossbars. And don't forget to take advantage of hanging space for crops such as strawberries.



To maximize usage, determine the perimeter space needed for all the chosen summer greenhouse crops. For instance, salad leaves can be sown in greenhouse borders before the space is needed for summer greenhouse crops, and benches provide plenty of space for seedlings, many of which will be moved outside when the space is needed for summer crops. Remember that cucumbers like it cooler so keep them by the door.

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The winter greenhouse often can harbour crops started earlier from seed and then transplanted from outdoors: arugula, Asian greens, spinach, Swiss chard, and lettuces such as May Queen or Rouge d’Hiver. Starting seed in an unheated greenhouse in winter can be problematic, even with a heat mat, which in cold weather may struggle to maintain warm enough temperatures.

Plants started indoors on a heat mat can be transferred to the greenhouse when weather permits. For instance, an onion crop propagated indoors in January and moved to the greenhouse in March can be kept growing in the same tray until it is time to plant them in garden in May. But depending on the crop and the microclimate, an unheated greenhouse may not be sufficiently warm for seedlings until April.

MAINTENANCE - Spring is a good time for greenhouse maintenance. In mid-April:

- Use a pressure washer to clean vertical surfaces.
- Examine existing growing frames to ensure they are still steady or build new ones.
- Check soil and fertilizer supplies. Island’s Finest Starter Mix or Reindeer Seed Starter are excellent choices for starting seeds indoors or in the greenhouse.
- Have potting mix on hand for transplanting seedlings into larger pots.
- Potting soil bags themselves can be used as planters by poking holes in the bottom and creating a slit across the top to accommodate up to 2 plants.

DISEASE - Most common diseases to look out for in greenhouses include:

1. Damping off – is a variety of fungi that attack seeds or seedlings. Seeds either fail to germinate or after emergence, seedlings suddenly fall over and die. It is most prevalent in wet and cool conditions.
Susceptible Plants – many species of seedlings, beans, peas, corn
Prevention: grow seeds at correct temperature; don’t allow them to chill at night; do not overwater; plant at correct depth in well drained soil; ensure good ventilation; move surviving plants to a warm, dry place
2. Grey mould – fungus produces brown, water-soaked spots on leaves, stems, berries or other plant parts that later turns to a greyish, brown layer of fuzz on the surface of damaged tissue.
Susceptible Plants – lettuce, strawberries, raspberries, grapes, begonia, geranium, roses
Prevention: improve the air circulation – ventilate daily and consider using a fan; allow soil surface to dry between watering – use drip irrigation to keep the leaves dry; use compost as mulch around plant to increase beneficial fungi and organisms; pick off damaged leaves and blossoms

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3. Powdery mildew – fungus starts as round, powdery white or grey spots on leaves. Fungus spreads to cover leaves and other plant parts; leaves turn brown and dry up. Fruit shows tan, russet patches and scars. Can infect plants in humid + dry weather.
Susceptible Plants – bean, beet, cabbage, cucumber, pea, squash, fruit trees, grape, strawberry
Prevention – choose mildew resistant or tolerant cultivars; rinse leaves of susceptible plants with water during mid-day, several times a week to wash spores of leaves. Do not use this method on plants at risk of other fungal diseases that spread on wet leaves.

PESTS - In summer, hang yellow sticky traps to provide early warning of pests.

Common greenhouse pests include:

1. Spider mites – are pin-point sized. Most spin fine webbing on leaves and tips of branches. Mites suck the content of leaf cells, leaving very fine, pale stippling on leaf surface. Advanced damage shows as browning or bronzing on the leaves. They reproduce at an astonishing rate in the hot, dry conditions found under glass in the summer
Susceptible Plants – cucumbers, raspberries, beans, fuchsias, impatiens
Prevention – inspect plants (with a magnifying glass) before you buy; isolate new plants from the rest of your plants for several weeks; maintain higher humidity in a greenhouse by spraying water on walkways during the day.
2. Greenhouse whitefly - Tiny pure white insects fly upward when infested leaves are disturbed. Have pin-point black eggs on the underside of leaves. Immature insects suck plant sap and drip honeydew onto leaves below.
Susceptible Plants – cucumbers, tomato, peppers, squash, begonia, fuchsias, hibiscus
Prevention – inspect plants (with a magnifying glass) before you buy; grow your own transplants from seed; catch adults on yellow, sticky traps; use a handheld vacuum to catch adults as they fly up; use insecticidal soap spray under the leaves
3. Leafhoppers – fast moving, wedge-shaped, sap sucking insects on the undersides of leaves showing white stippling. Local species can be white, pale green or brown.
Susceptible Plants – roses, fruit trees
Prevention – it is rarely necessary to control leafhoppers on plants other than roses. If necessary to spray insecticidal soap, wait until mid-summer after the main period of aphid attack on roses (the spray will kill aphid predators + cause an aphid infestation).
4. Aphids – tiny, pear shaped insects in colonies on the undersides of leaves. They have a tiny pair of pipes pointing backwards from their tail ends. They suck sap which distorts leaves and drop honeydew that encourages sooty (dark) mould.
Susceptible Plants – beans, peas, peppers, potato, lettuce, roses, fuchsias, hibiscus

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Prevention – Keep plants adequately watered and avoid over-fertilizing with nitrogen. Plant nectar and pollen rich flowers (i.e. alyssum, dill) nearby to attract aphid predators. Blast them off plants with a strong stream of water + spray again 2 days later.

GETTING STARTED

The following is a guide to sowing seeds either indoors or in a greenhouse using a heat mat. As the weather warms, a heat mat becomes less necessary.

Late winter

- Sow hardy plants such as celery, celeriac, leeks, parsley, peas and onions.

Early spring

- Sow summer broccoli, indeterminate cabbage, cauliflower, cucumbers (grow the first crop in the greenhouse as they don't need much heat), eggplants, peppers and tomatoes.

Mid-spring

- Sow fast-growing tender plants such as basil, cucumbers, melons, pumpkins, squashes, determinate tomatoes, sweet corn in individual pots and bean sprouts in vermiculite.

Late spring

- Sow more basil, Brussels sprouts and winter cabbage.
- Start more beans and corn.

Early summer

- Sow early cauliflower and more beans and corn.
- Sow winter broccoli, winter cauliflower and quick-maturing winter cabbage.

Mid-summer

- Harvest summer crops.
- Sow beets, winter carrots, endive, kohlrabi, radicchio, rutabagas and Swiss chard for winter harvest.
- Sow French beans and parsley outside for bringing in when summer crops have finished.

Late summer

- If space allows sow lettuces and baby carrots indoors to make use of the autumn sun and provide late harvests.
- Sow winter crops such as arugula, broccoli rabe, Chinese cabbage, summer cauliflower, collards, daikon, kale, sweet onions, scallions and spinach.

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Autumn

- Remove spent summer crops.
- Plant hardy lettuce cultivars and spinach into beds or growbags to harvest over winter.
- Sow pea shoots to be harvested indoors in spring.
- Strip tomatoes off all plants in October and ripen indoors using boxes or crates with crumpled newspaper, so that the tomatoes don't touch each other. Store in a cool, dark spot and check daily to cull ripe tomatoes and discard rotten ones.

References

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Shade cloth



A greenhouse can be an accent in your garden!