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# Equipment for Small Scale Greenhouses in Northern Manitoba



Using a greenhouse is an ideal way to start plants indoors and get a jump on the short northern growing season. The information below is specifically for people in Northern Manitoba who have put up a greenhouse and want to arrange the inside work space.

## Setting up the Greenhouse

### Walkway and Floor

In most non-commercial greenhouses, a solid floor is not necessary. In fact, depending on greenhouse size, sometimes gardeners will plant a portion of their vegetables directly into the ground inside the greenhouse. To prevent weeds growing under your tables, cover the ground with a landscape fabric (plastic will work, but water will collect on it). Putting gravel on top of the landscape fabric will extend its life.

Walkways can be a solid, well-packed path, or constructed of concrete for easy movement of equipment (wheelbarrows or carts) and people. Sidewalk blocks are inexpensive and easy to install. Walkways can be two to three feet wide in a small greenhouse. Adjust the width of walkways for a cart or wheelbarrow. Consider the size of your tables, as well as the overall size of the greenhouse, when determining layout. Your tables should be two to three feet wide if you are accessing them from one side, or five feet wide if you are working on both sides. For a person in a wheelchair, use at least four-foot wide aisles and ramps for easy access.

### Tables and Workstations

Tables can be built from a variety of materials and arranged in many different ways. If you plan carefully, 70 to 80 per cent of your floor area can be used for growing plants. Wood, metal pipe or concrete blocks will work as bench supports. Make sure the surface is strong enough to support plants and large containers without sagging, and also open to allow water drainage and air movement.

Tables should be two to three feet wide with access from one side (you need to be able to reach to the plants in the back), or four to five feet wide if you are working on both sides (i.e., down the middle). If you are using solid-topped tables, set them six inches back from the side wall of the greenhouse to allow for air movement. The tables should be average table height (about 36 inches high), so you do not strain your back. For individuals in wheelchairs, or people who like to sit down while they work, the height should be lower (24 to 30 inches). Place supports and legs six to 12 inches back from the surface edge to provide knee room.

Hooks can be handy for hanging baskets from the roof. Make sure they are of a height to allow for watering and your arch supports are strong enough to carry the weight.

Make a work area for potting and maintaining plants. This may be located inside or outside the greenhouse. The north wall is often a good location for a work area inside the greenhouse.

## Planting Containers

You can use just about anything to plant your seeds in, as long as they hold soil and support the seedlings and plants. Make sure they have drain holes in the bottom of the container. Start seeds in household items, such as yogurt containers, cut down milk jugs, paper cups, plastic pop bottles, margarine tubs or even plastic bags in cardboard boxes. Seeds can also be started in plastic or wood trays that are quite wide and a few inches deep.

Except for peat pots, containers can be saved and used again the following year. If you decide to reuse containers, make sure to wash the containers with hot water and chlorine bleach to sterilize them before use. Use about nine parts water to one part bleach, soak the containers for about five minutes and rinse thoroughly. This will help prevent the spread of disease. You can also use this bleach solution as a scrubbing solution for mould in your greenhouse.

## Watering

To water your plants, you can collect water in a tank or barrel and store it either inside or outside the greenhouse. Cover the water tank or barrel with a black plastic sheet or paint it black to avoid algae growth in the water. While it takes up room, storing the water in your greenhouse serves a dual purpose: during the day, the water will absorb heat and this heat will help keep the greenhouse warmer at night as temperatures drop. Of course, if you use this stored water, you will have to manually water the plants with a watering can. A garden hose with a gentle sprinkler can be less labour intensive.

## Power


Access to power is usually necessary for additional lighting, heaters or fans. Run a CSA approved outdoor extension cord from the house or the closest location. Use an extension cord that is rated to handle the wattage of the devices with which it will be used.

## Lights

The earlier in the spring your greenhouse is in operation, the more critical lighting becomes. Plants need about six hours of direct sunlight, and in early spring, there may not be that much natural light. There are many kinds of greenhouse lights, but the most readily available and often the cheapest are the fluorescent tube types. T5's provide the best type of light for plants, but T8's will work as well. This number is stamped on the tube. They use standard, readily available fixtures. Keep the light fixture close to the plant canopy and move it up as the plants grow.

## Soil

Quality soil is important. Collect sand, black soil and peat moss in the fall for your bedding plants and store it in your greenhouse for use in the spring. Composting can also be a good way to build soil for your greenhouse. If you want to ensure your soil is disease free, you can sanitize it by putting it in a heatproof container; spread it no deeper than four inches, cover with foil and place in an oven at 200°F for 30 minutes. The soil will produce an odour when it is cooking. Let it cool before using. If you want to use the



microwave, place the soil in a microwave-safe container for 90 seconds per kilogram (2.2 pounds) on full power. Let the soil cool before using.

Mix two parts of the black soil with one part peat moss and one part sand. A wheelbarrow and a shovel work well for mixing. Use purchased potting soil or a soilless growing medium made of peat moss, vermiculite or perlite for starting seeds indoors. Vermiculite or perlite is lightweight and porous, so it is ideal for young roots. Many garden centres have growing mix or seed-starting mix. A growing mix containing mycorrhizae is ideal.

## Thermometer

A thermometer, while not necessary, can be handy. Plants do best in temperatures ranging from 15 to 20 degrees Celsius. Do not let temperatures in the greenhouse drop below plus six degrees Celsius. If overnight temperatures are dipping too low, then a heater may be required. If temperatures get too high, which is common in greenhouses, the soil will dry out and plants can get too hot and die. If it gets hot in your greenhouse, open doors. If that does not help, a fan may be required to pull in cooler air. Place the thermometer where the plants are located.

## Work Crew

A dependable, committed work crew is probably the most important component of a successful growing season! There are numerous tasks, like watering, temperature checks, transplanting and weeding. These tasks continue for the entire growing season. To achieve success, it can be helpful to develop a sign-up sheet for the work crew, so expectations and responsibilities are clear.

## During the Growing Season

### Watering

Keep soil moist, but not wet. To check, press your finger into the soil. If the soil feels dry, add water. On hot days, you may need to water twice. The roots need water to grow, so water the soil and not the leaves of the plant.

### Fertility and Nutrients

Northern clay and sandy soils are naturally low in nutrients. Compost, waste fish and well-rotted animal manures are ways in which gardeners can add nutrients to the soil for plants to use. Commercial fertilizers are available in either granular or liquid, and are another way to add nutrients to the soil. Liquids have the advantage of being easily applied and quickly absorbed. However, they are generally more expensive, and they do not remain in the soil as long as solid fertilizers, so they must be applied more often and in smaller doses. Granular fertilizers mixed with potting soil will provide many weeks of slow release nutrition. One third pound of a water-soluble fertilizer, such as 16-20-0 or 11-48-0, is a general recommendation. Instructions for mixing are on the label.

## Insects

Before bringing a plant into your greenhouse, check it carefully for any insects or diseases. Also, if you notice bugs in your greenhouse, first identify them. Some insects are good (i.e., ladybugs), and some are not. The most common insect pests we see in northern greenhouses are aphids, flea beetles, mealy bugs, spider mites, thrips, fungus gnats and white flies. Once you determine you have a pest, check with garden supply retailers to see what is available for control. There may be biological control methods or pesticides you can use. Many products will control more than one type of insect. Read labels carefully and apply products properly.

Discard or isolate weak, diseased or badly insect-infected plants outside of your greenhouse and do not take in every friend's sick plant. You are asking for trouble if you do!

## Regular maintenance

Spending time in your greenhouse is necessary. Tasks are ongoing throughout the growing season and include transplanting, thinning, watering, temperature monitoring and weeding. As well, inspect all equipment and systems routinely and develop a preventative maintenance schedule.

Finally, consider the following points. They can prevent problems and can make life with a greenhouse more enjoyable.

- Gain experience with plants that are easier to grow, before trying the difficult ones.
- A greenhouse requires a considerable time commitment, so do not start a greenhouse if you are unable to commit the necessary time.
- You will need to allot enough time to the greenhouse each week to be successful.
- Plants in a greenhouse are a responsibility. Do not leave them without care and do not allow plants to dry out.
- Keep your greenhouse and surrounding areas clean, organized and in a good state of repair.
- Learn more about greenhouses and growing plants by reading and talking to others.
- Enjoy the greenhouse; arrange work intelligently so it does not become a chore.
- Engage others in the community. Involving elders, youth and community members in your greenhouse endeavour will benefit everyone and have more people committed to success