

TIPS ON KEEPING YOUR GREENHOUSE FIT FOR ALL SEASONS

Including some information on Temperature Control Techniques

Information extracted from various sources

Greenhouses are used largely to extend seasons and control conditions for the growing of crops. These may be specialist varieties of any kind, or general seedlings and vegetables etc. The controlled environment can assist with growth for longer periods and getting crops started before the usual seasonal changes.

In some colder regions of the world, due to very short growing seasons, and very short daylight hours, the only way to have a vegetable garden is to grow one in a greenhouse.

To give you an idea of the insulation that the polycarbonate provides in our small greenhouses, we could safely say that if the outdoor temperature is around zero degrees, the inside temperature in the greenhouse with doors and vents closed, should be in the region of 6 or 7°C.

Although we are usually very concerned about keeping the warmth in during the colder months, the trick is to try maintain the right temperature for your crops inside during both winter and summer.

In the summer months, the greenhouse must be kept cooler in order for crops to survive. Of course, a lot depends on what crops you are growing. Greenhouses can overheat easily especially in hot climates like we experience in South Africa. There are a number of ways to maintain the right temperature for your plants. Below are some tips and accessories that we strongly recommend to ensure that your plants will be comfortable no matter how extreme temperatures are in winter and summer.

Choosing a Site for your Greenhouse

Choose a level, clean site, in a low traffic area with easy access. Consider the following factors:

- The change in the angle of the sun between summer and winter.
- Shade cast by the trees – in hot SA climates shading will help reduce temp.
- Growing trees and existing deciduous / evergreen trees.
- Ease of access to water and electricity if required.

Temperature / Light:

The more sun that is provided, the more heat the greenhouse will produce. The more heat produced the more ventilation is required. Place a thermometer near the middle of your greenhouse and monitor the temperature at different times. In hot climates, a simple option is to open the door/s in the morning and leave them open until late afternoon.

Clients have reported excellent results in reducing the temperature in the greenhouse by painting the roof panels white. Recommendations: Paint product called 'Super-cooler U-12' (an Israeli product) available from Vegtech 2000 Pty Ltd. Another client recommends normal white PVA. To be painted on the outside of the roof panels.

Greenhouse Shading

Shadecloth can be helpful if you live in a very hot climate or only have a position for the greenhouse which receives full sunshine all day. Shading can also be adapted to the varying seasons and times of the year, and angled correctly for your specific situation.

Whatever type of shadecloth you choose, make sure the cloth is loose over the vents to allow opening and closing functions, as proper ventilation is another important key to maintaining the correct temperature for your plants. Clients have also suggested cutting the shadecloth to fit the top opening panel of the roof vent, and fixing it permanently to the vent frame.

Greenhouse Ventilation

Be sure to provide adequate window vents in your greenhouse. Cross ventilation will help prevent the greenhouse from overheating. Place the vents so that they will take advantage of prevailing winds. Most greenhouses should have vents that equal in size to 15% of the floor space.

A tip from an experienced client: To ensure that your vents do not get ripped off in strong winds, attach a wire or heavy-duty string to both sides of each vent and the greenhouse frame. Allow enough play in the wire or string to allow the vent to open and close as needed. In strong winds, be sure to close your vents and latch them securely.

Automatic openers on the vents also assist correct temperature control and ventilation. Louver vents are included with each greenhouse as they increase cross ventilation.

An alternative to extra vents is having a thermostatically controlled exhaust fan system. Using very little electricity, the adjustable thermostat automatically provides ventilation for your greenhouse. The proper size fan will change the air intake in about 2 minutes. To select the size for your greenhouse, determine the volume of the unit (Length x Width x Average Height) and multiply by 0.75 to obtain the ventilation rate in Cubic Meter per Minute (CFM). For the exhaust fan to operate effectively, fresh air intake shutters must be provided at the opposite end of the greenhouse. The shutters open with the flow of air drawn into the greenhouse by the fan or they can be opened and closed by a motor.

Please see separate information about the solar ventilator fan that we offer on our website.

Greenhouse Misting / Humidity Control

Although shading and ventilation will keep your greenhouse from overheating, the actual cooling of a greenhouse comes from the evaporation or moisture inside the greenhouse. The evaporating water soaks up heat like a sponge, when heat is used to change water from a liquid to a gas. Good air circulation from fans increases evaporation.

A good misting system disperses water evenly around the greenhouse. The amount of moisture needed depends on the amount of ventilation, shading provided, your climate and the weather. The most accurate and most reliable is an automatic system of misting nozzles. An easy and affordable system of cooling, is to soak the floor with a sprinkler hose and open the roof vents and door, and the entire unit will cool down quickly. This

must be done a number of times during the hottest times of the day.

Only apply misting during the day to avoid excess humidity at night. Use a 24-hour timer to shut off the system 2 hours before the sun goes down. If you live in a dry climate, in addition to your misting system an evaporative cooler works well. Air is cooled 3 to 5°C degrees by water evaporation as it is drawn through the cooler and into the greenhouse.

Irrigation

Many owners choose the control of hand watering, however drip irrigation systems are effective and also prevent the leaves from getting too much water on them. Drip systems are gentle on seedlings, too. Over-watering in a climate controlled greenhouse environment has been the death of many a plant or seedling.

Heating

Greenhouses can be heated with gas, paraffin or electricity, with or without thermostat controls. Your heating requirements will depend on your plants, climate, location of your site, and the construction of your greenhouse. Our greenhouses, with UV coated Polycarbonate glazing is better than most greenhouses in providing sun protection, light diffusion, and heat insulation.

A heating system must be able to maintain the desired temperature during the day and night. Your inside temperature should not go below 7°C at night. For some plants even 7°C is too low. For larger greenhouses, gas heaters are recommended because it is less expensive. However, if your area suffers power outages, a gas heater might be more reliable. Any type of heating system you use should be properly vented to the outside of the greenhouse to avoid build up of any harmful gases.

To calculate how many BTUs your heater will need to provide and maintain the correct temperature for your greenhouse you will need to know:

- The area of your structure - the total square meters of the surface area (do not include the floor space).
- Minimum outside temperature-the lowest temperature for your area.
- Maximum Inside Temperature-the highest temperature you would need inside the greenhouse.
- Heat loss value: 0.7 for twin walled 4mm and 6mm thick polycarbonate.

Now the formula:

Take your Area and multiply it times the (Max temp. minus the Minimum temp). Multiply heat loss equals the minimum amount of BTU output your heater you will need for your size greenhouse

Maintenance:

Your greenhouse will have maintenance requirements. Look out for bugs and fungus and keep the greenhouse clean. Use herbs as natural insecticides. Look for natural / organic pesticides. Both the inside and outside of the greenhouses can be sprayed down with the hose on jet nozzle.