Steps in Building a Solar Greenhouse

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To build or not to build? That is the question. Last week I shared with readers my experience with my solar greenhouse and how to operate it. This week I am continuing with the greenhouse theme and providing a checklist to help you determine if you want a greenhouse and if so the what, when, how and why of these season extending devices for the garden. Often the hardest part of the whole decision is what shape or style to make it.

Plants won’t grow without effort or attention. The grower must provide the heat, water, ventilation and other conditions that nature normally provides. Everyone does not need a greenhouse. Many gardeners enjoy the four seasons without trying to grow plants in the winter.

Hobby greenhouses can be built inexpensively for only a few dollars with recycled materials or they can be built as wonderful conservatories costing many thousands of dollars. The cost of the structure has little relationship to the quality of the plants that are being produced.

For those who decide to build a greenhouse, choosing the type of structure, covering, and environmental control equipment is confusing. Follow this step-by-step approach to help you organize the planning, construction and operation of your hobby greenhouse.

Step 1: Decide what plants you will grow, what times of year you will use the greenhouse and how a greenhouse fits into your lifestyle. Starting seeds or propagating cuttings can be done with a simple cold frame or hotbed. A freestanding greenhouse can also be used for this purpose.

Growing tropical plants year-round in a conservatory setting requires a more permanent and formal structure. Many design their greenhouses to grow speciality plants that have unique requirements, such as orchids, African violets, or bromeliads.

Step 2: Decide if the greenhouse can be a part of your home living area or if a detached greenhouse located away from the home is best. Each has advantages and disadvantages.

Step 3: Decide what style of a greenhouse to build. As mentioned this is often the hardest part. Greenhouse design styles vary widely and include Quonset, tri-penta, dome, gothic arch, slant-side, A-frame, gable roof, straight-side lean-to, curved-side lean-to, and slant-side lean-to.

Some styles like gable roof or Quonset are more efficient to heat and cool. Others, such as the dome and tri-penta look attractive but are difficult to construct or heat and cool. The A-frame style is easy to construct and is inexpensive, but the usable growing area is small and awkward.
Step 4: Choose a location for your greenhouse. You may be limited on locations that have adequate sunlight, drainage and easy access for people, materials or utilities. Structure appearance is usually most important, so compromises may be made to meet location requirements.

Most plants require full sun to do well. These are the preferred locations in order: first--south or southeast, second--east, third--southwest, fourth--west, and last--north. A western exposure is too hot in summer, and a northern exposure does not receive enough light for most plants.

Step 5: Choose a greenhouse size to suit your needs. Available space and cost determine the choice of size for a hobby greenhouse. A small greenhouse costs more to operate per square foot than a larger one and temperatures can fluctuate rapidly in a small greenhouse. Heat costs can be as high in a small structure as they are in a larger greenhouse.

Step 6: Decide how to provide utilities to your greenhouse. Check building codes before building a greenhouse on your property. Some codes prohibit greenhouses or place restrictions on size, type, covering, or construction materials. Be sure all electrical work is performed according to code and install a backflow prevention valve in the water supply line to prevent the possibility of contaminating the water in your home.

Step 7: Choose a covering material. There are several covering materials to choose from, each of which has its own advantages and disadvantages. Common covering materials are glass, polyethylene film, fiberglass, and double-layer structured panels (more on glazing next week).

Step 8: Choose framing materials depending on the desired permanence and cost and the type of covering material chosen. Many homemade greenhouses are made of wood. Metal-framed greenhouses are more permanent but are difficult to fabricate from scratch. Greenhouse manufacturers offer many kits that are reasonably priced and easy to erect.

Step 9: Choose the type of floor and walkways. A solid floor is not necessary. Four inches of gravel helps control weeds and lets water evaporate to provide some cooling. If you want a solid concrete floor, install one or more French drains. Walkways can be constructed of concrete, bricks or stepping stones.

Step 10: Choose the type of benches. Benches are constructed from many materials and arranged in many different ways. If you plan carefully, 70 to 80 percent of the floor area can be used to grow plants. Make sure that the supports are strong enough to hold large plants. Wood, metal or concrete block can be used as bench supports and the tops can be fabricated from wire mesh wood or plastic.

Step 11: Decide how to heat your greenhouse. Greenhouses are poorly insulated structures and lose considerable heat through the covering. Heat sources include electricity, natural gas, propane, fuel oil, solar energy, or kerosene (emergency use only). Natural gas or propane are probably the most cost-effective ways of heating a hobby greenhouse. If natural gas is available in the home, plumbing into the existing line saves considerable cost over a new meter and gas line.
Step 12: Decide how to ventilate the greenhouse to exchange carbon dioxide and oxygen, to remove hot air, and to lower the humidity. Greenhouses are vented by natural flow-through ventilation or forced-air ventilation. Flow-through ventilation uses side and top vents to pull cool air into the greenhouse. Manual vents require frequent temperature checks and vent adjustment for outside conditions. Electric motors and thermostats on automatic vents are much easier.

Step 13: Decide how to cool your greenhouse. Cool your greenhouse in the summer by reducing light intensity. Greenhouse whitewash, shade cloth, screens of wood or aluminum, or Venetian blinds can be used for shading.

Step 14: Choose work and storage areas. Make a work area for potting and maintaining plants. This may include a sink, storage areas for soil and containers. Protect them from the weather in an area where they are not an eyesore.

The checklist offers guidelines and suggestions but the process is not always simple. take the time to learn about and investigate your possibilities. Careful planning will save much future grief as you plan, build and enjoy your greenhouse in the future.

For more complete information on hobby greenhouse construction check my website at larrysagers.com

Follow these greenhouse "do's" and "don'ts."

Do's: Keep the greenhouse and surrounding areas clean and organized.
   Allot enough time to the greenhouse weekly to be successful.
   Keep the greenhouse in a good state of repair.
   Discard weak, diseased, or badly insect-infected plants.
   Enjoy the greenhouse; arrange work intelligently so it doesn't become a chore.

Don'ts: Don't take in every friend's sick plant. You're asking for trouble if you do!
   Don't start with the most difficult plants. Gain experience with plants that are easier to grow before trying the difficult ones.
   Plants in a greenhouse are dependent on you. Don't leave them without care.