Hobby Greenhouse Association

Before You Buy or Build - Planning for Your Hobby Greenhouse

The first step in planning for a hobby greenhouse is to ask yourself some questions.

1. Do you want a structure that will be used primarily as a living area or solarium? Or, do you want a greenhouse that will be used predominantly for growing plants? What about a combined use?

2. What kinds of plants do you want to grow in your greenhouse: orchids, cacti, citrus, foliage, vegetables, seedlings, etc.? Consult an indoor gardening book for the environmental requirements of your chosen plants. Costs can vary greatly on structure size and environment needed for the type of plants you choose to grow.

3. Do you have a site that will provide these plants with adequate sun or light?

4. Consider building in stages, 3 season greenhouse this year (no heat source), 4 season in 5 years (selecting a heat source); saving money and gaining experience.

Greenhouse, Solarium or Both?

While plants may be grown in a solarium, this structure is primarily a living area for people. It is designed with owner comfort primarily in mind rather than to provide the best environment for plants. Solariums are often the modern version of a sunporch and are usually an integral part of the house.

Greenhouses are designed to provide the best growing conditions for selected plants, although including a spa or breakfast nook is not uncommon. Greenhouse architecture can range from an elaborate and beautiful edifice to a very simple, utilitarian structure, but the requirements for providing a tailored environment for plants is primary.

A space both for people and plants involves choice of plants that can thrive in a reasonable, often compromise, solarium environment. Plant selection is more limited than in a greenhouse, but many plant choice options remain.

Choosing a greenhouse type

Greenhouses are either attached to a building or free-standing.
Lean-to greenhouses are attached to an existing building along one long side. Even-span, or similar, attached greenhouses are joined to a building at one end and combine the advantages of a free-standing greenhouse and some of the lean-to design. They allow light to enter through three sides and the roof, and they provide easy access for people and utilities.
Attached greenhouses may be less expensive to build and heat because they share a wall with an existing structure, and it is easy to tap the solar heat generated to help warm the residence. Attached greenhouses, however, are often subject to residential building codes which can require excessive structural elements which block some outside light.

Another type of attached greenhouse is the window greenhouse which usually replaces an existing window, so it provides a small growing area without adding any building code required structure. Small but at a fraction of the cost of a hobby greenhouse.

Free-standing greenhouses provide the most light for plants. Their configuration allows for flexibility and efficiency in the arrangement of benches and other furnishings. Because of their full exposure to the outside environment, however, they are more expensive to heat. Some free-standing and even-span greenhouse designs have a south-facing roof and wall, with the interior of the north wall often painted white and may have some form of insulation.

Choosing a site

Ideally, one long side of the greenhouse should face south, southeast, or southwest, and one end should catch the morning sun to the east. Many times, the perfect site is not available; however, most are workable with the addition of artificial light or increased shading. If only a northern exposure is possible, shade-loving plants will flourish.

The south side of the greenhouse should not be shaded by trees or buildings. While deciduous trees with fine foliage may provide dappled summer shade, a bare tree can reduce the sunlight shining on the greenhouse as much as 50% in the winter.

Consult your local Building Inspector and Zoning bylaws before you make any final decision on the site. You must determine whether there are any laws that will affect your choice. Also inquire about the need for a building permit and

ask if there are any special requirements for greenhouse construction in your area. Some areas exempt small structures from building codes.

You will probably want some utilities in your greenhouse. Can you extend electricity, water (hot and cold), and gas, if available, to this site? Plan now for the conveniences you want. All electrical circuits in the greenhouse must be protected by Ground Fault Interrupters (GFI) because of the dampness, most conveniently by employing a GFI outlet nearest the source.

A final consideration in choosing a site is ease of access to your greenhouse. Can you enter your attached greenhouse without having to go outside? Can you reach your free-standing greenhouse easily in winter?

Choosing a size

No matter what size greenhouse you choose the chances are you may one day feel that it is too small. Therefore, build the largest greenhouse that your budget will allow. While many greenhouses are modular, and more units can be added later, it is more efficient and cost-effective to build the larger structure in the beginning. An added advantage of the larger greenhouse is easier control of heating and cooling. Temperature and humidity fluctuate rapidly in the small greenhouse.

Kits or plans:

Many greenhouses are available in kit form. They may be erected by a contractor or anyone handy with tools and familiar with construction techniques. Decide whether you wish to construct your greenhouse kit yourself or hire a contractor.

If you decide to build your greenhouse "from scratch," university Extension Services frequently have greenhouse plans available, and some books on greenhouses include detailed diagrams and instructions. Public libraries are a resource as well for greenhouse information. Recycling building materials of thermo paned windows or sliding doors can be a real cost saver in the budget of building a greenhouse.

Greenhouses can also be custom designed and built for you by many of the greenhouse manufacturers or local contractors.

Frame:

Most greenhouses and solariums have extruded aluminum or steel frames. Some are made of wood or PVC.

Aluminum is lightweight and strong. Because it conducts heat and cold, some aluminum framing has a thermal break of a less conductive material between the outside and inside surfaces of the frame.

Western Red Cedar, redwood, and cypress lumber are used to frame some greenhouses. Wooden frames have the advantage of minimally conducting heat. They also provide surfaces to which accessories may be easily tacked or fastened with nails and bolts.

Steel and PVC tubing are usually used for hoop-type greenhouses that are covered with greenhouse film. These structures tend to be less expensive than metal- or wood-framed green-houses.

Glazing:

The original glazing for greenhouses was glass, and many people still consider it the preferred material. Aesthetically, it probably is the best, but practically, it has some drawbacks. Glass allows excellent light transmission and provides a clear view from inside and outside. It is scratch resistant and easily cleaned. It can be shaded with shading compounds or shade cloth. It may be cheaper than rigid plastics and is readily available. It also breaks easier. Tempered glass should be used for the roof and within one foot of door and window openings for safety.

In an area where there are severe hailstorms or icing conditions, or where vandalism is a problem, plastic glazing may be the answer. Rigid sheets of acrylic and polycarbonate are popular for their light weight and ease of fabrication. Single, double and triple-wall panels are available. Some plastic panels are clear. Others are translucent, providing even, diffused light throughout the greenhouse. Fiberglass is also used extensively but should be treated so that it will retain good light transmission as long as possible. Several polyethylene films are available for glazing. Their durability depends upon their ultra-violet resistance and their thickness. Their light transmission varies. Polyethylene film, with six-mill the most common, is the cheapest covering available and is very easy to apply. It can also be used inside the greenhouse to provide an inner lining to reduce heat loss.

Foundation:

The foundation must be completely level. Some manufacturers provide a base for their greenhouses, but usually you will have to provide your own. Depending upon the manufacturer's recommendations and the climate, the foundation may be anything from landscape timbers or cement blocks to fully constructed masonry walls. Some greenhouses are glass to the floor and others have a knee wall around the bottom. Typical attached greenhouses need to have footings to meet the specifications of your local building codes. This pertains to glass to floor design, or a knee-wall designed foundation. Proper footings in northern climates ensure a strong long-lasting structure that will endure for years.

Floor:

Greenhouse floors should drain well. Many greenhouse floors are first excavated to the desired depth and then filled with rock or gravel to provide both drainage and a heat sink. Some-times the walls of the excavated area are lined with insulating material to prevent heat loss. Bricks or paving stones can be placed on top of the fill if desired. Poured concrete or other solid floors should slope to a drain. Dirt floors should have a paved walkway or be covered with a high-quality landscape fabric.

Ventilation:

Adequate ventilation and good air circulation are extremely important in controlling temperature and to prevent mildew and condensation. Plants need fresh air and carbon dioxide. Green-houses should have roof and floor-level vents to promote natural air convection. Gable exhaust fans will help to move air through the greenhouse and many owners install small 24/7 wall fans to circulate air.

Heating and Cooling

Heat:

Most greenhouses will need some type of heater even if it is only used during unusually cold weather. Your type of greenhouse, its glazing and exposure, your desired interior temperature, your plants, and your climate will dictate your heater requirements. Consult the greenhouse manufacturer, his local dealer, or books on greenhouse maintenance to determine the size heater you will need.

Electric, oil, or gas space heaters are efficient and frequent choices. You may need to install a separate 220-volt circuit for some electric heaters. A water heater /circulation pump used for a perimeter of fin radiators can also be a heat option.

Provide proper venting to the outside for combustion heaters and check state and local laws for any restrictions on their use.

Solar greenhouses rely on the sun for all or part of their heat. Consult an expert on solar heating. All greenhouses generate some heat.

Cooling:

While fans and vents provide adequate cooling for many months of the year, during hot weather further measures are usually needed. Shading is the most common way to cool the greenhouse, as well as to protect the plants from burning.

Greenhouse roofs may be painted with whitewash or special shading compounds that wear off by winter. These materials may be harder to remove from plastic glazing, so it's best to read the label. The roof may be covered with shade cloth, available in several densities, roller shades or Aluminex may be used.

Watering and misting systems help to cool the greenhouse interior. A swamp cooler can also be installed if local humidity is sufficiently low or if a large volume of blowing air is necessary.

Furnishings and equipment

Plants can be grown directly in beds in the ground, in containers, on benches, and on shelves. Frequently all types of growing areas are utilized in the greenhouse at once, including hanging pots. This provides several different interior climates allowing a variety of plants to be grown.

Maximum/minimum thermometers and a humidity gauge will help you to monitor the interior environments of your greenhouse. A temperature alarm is good insurance against plant loss due to overheating, a power failure, cold, or a malfunctioning heater. These instruments are readily available from greenhouse supply companies.

If you have a water supply line, there are various manual and automatic watering and misting systems which may be added. A sink such as a common plastic washtub on legs is also a handy piece of equipment. It can double as a potting bench with the addition of a cover.

Small fans can circulate air in hard to reach areas and provide general air movement when vents are closed.

A self-coiling hose with an attached watering wand makes irrigating the plants much easier. Benches are available from greenhouse supply companies and manufacturers, or you can construct your own to fit your space.

Time and care

Greenhouses require time and care to be successful, but they need not limit your other activities. How much time you devote to your greenhouse will depend upon your goal, your plants, and your lifestyle. Automatic venting, heating, cooling, and watering devices are available that will allow your greenhouse to function well without your constant attention. The hours that you do spend in your greenhouse will bring you all the benefits and pleasures of year-round gardening.

Decision-making

After perusing the directory listings, check web sites and send for catalogs of the greenhouses that might fit your needs. Look over the information carefully, talk to the manufacturer's representative, see the products if possible, and ask questions of hobby greenhouse owners in your area. Gather as much information as you can. Making these decisions are the toughest and most important part of this project.

When you have selected your greenhouse, be sure that your purchase agreement clearly states in writing the responsibilities of the greenhouse buyer, the dealer, the manufacturer, and any contractor involved. This will prevent misunderstandings. You should also fully understand the product warranty and who is responsible if there is a problem after purchase or construction.

Enjoy your greenhouse! Experiment! Learn to grow extraordinary plants!

The Hobby Greenhouse Association is a nonprofit 501(c)3 organization of residential greenhouse owners, those who plan to build a greenhouse in the future, and those who grow plants in windows and other indoor areas, or under lights. The Association was formed over 42 years ago. Information is shared among the members through the Association's quarterly magazine, HOBBY GREENHOUSE and a quarterly newsletter, HGA NEWSLETTER. Membership in the organization also provides access to the help and advice of experienced greenhouse growers, product discounts, and both mail and e-mail correspondence on greenhouse topics.
HGA has members throughout the United States, Canada, and overseas. If you would like more information about membership in the organization,
Please go to: www.hobbygreenhouse.org or contact our membership director at: hgamembershipdirector@hotmail.com
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