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Greenhouse Buying Guide

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So You're Thinking About Buying a Greenhouse

Eventually every gardener considers the purchase of a greenhouse. A greenhouse offers the opportunity to enjoy gardening every month of the year. It also represents a considerable commitment in money, time, and space. This guide has been developed to help you select from the variety of available greenhouses.

You will want your greenhouse to meet both your gardening needs and your pocketbook. This guide can help you decide what type of greenhouse best fits these requirements, whether it is one from us or a different greenhouse.

1. What size greenhouse?

Greenhouse size is usually dictated by factors like available space and construction costs versus need or desire. When choosing a size, consider if the greenhouse will be used year-round, seasonally, or mainly as a sunspace. If you want a greenhouse to house an extensive collection of houseplants, then it is best to plan on building or purchasing a structure that is larger than your current space requirements. Most hobby greenhouse owners find they need a larger greenhouse than they originally thought. Upgrading later on may be more costly than ordering a larger unit from the beginning. Another important size consideration often neglected is height. You want to make sure your greenhouse has adequate head room. You need to consider both peak and eave (sidewall) height. Taller houses are also easier to heat and ventilate because the air has a greater buffer area.

2. What will the greenhouse be used for?

Are you using it for year-round vegetables and flowers, foliage houseplants, or seasonal seed starting for the outdoor garden? A tightly sealed and insulated greenhouse with high light transmission is desirable for year-round vegetables and flowers (especially in northern climates) but not necessary for foliage plants and seed starting. Remember, greenhouses are designed to store heat from the sun and create a warmer environment inside of them, so use in the summer in most areas would be limited at best.

3. How elaborate do you want the greenhouse to be?

If you are just starting seedlings or wintering over a few plants too tender for your area's winters, then a simple plastic greenhouse with few accessories other than ventilation and possibly a heater (depends on location) are needed. You should consider upgrading to

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twinwall polycarbonate or an inflated double layer of polyethylene if you plan to grow plants in the winter because of their heating efficiency. If you are interested in an attractive greenhouse, a painted frame and glass covering are popular options. The [Cape Cod](#) series of the [Cross Country](#) greenhouse line are even available with a combination of glass and polycarbonate providing both beauty and function.

4. Is a building permit required?

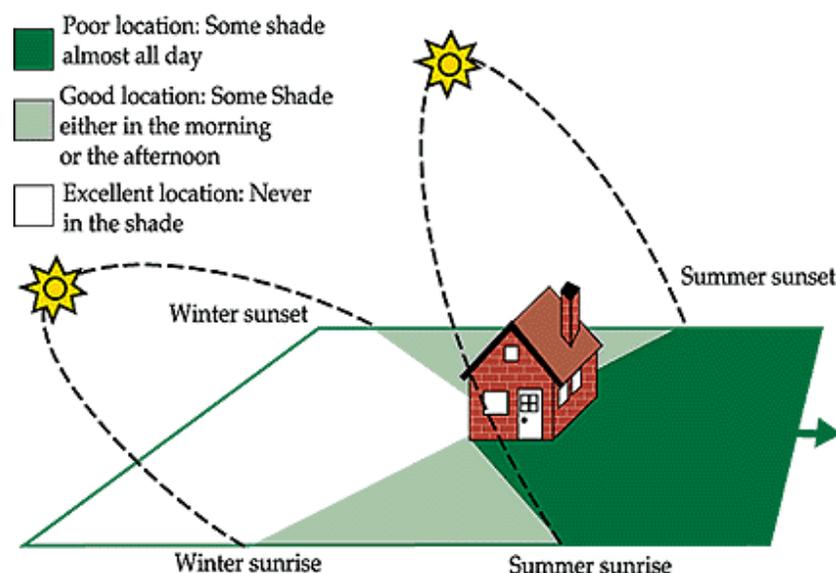
Check local ordinances for required setbacks from property lines, design requirements, and other requirements. Call your local building department. Some hobby greenhouses may not need a permit, but it is a good idea to check anyway.

Selecting a Site for Your Greenhouse

Choosing the right site for your greenhouse will not only determine how well it works as a greenhouse, but how much you will enjoy it. There are several factors to consider in choosing your site.

1. Sunlight

If the greenhouse is going to be used primarily for starting seeds and transplants or plant propagation in the summer, place it in partial shade to minimize heat buildup. You can use a shade cloth to control the amount of sunlight reaching the interior if a partially shaded site is not available. If the greenhouse will be used for growing in late fall and winter, or growing plants to maturity, it will need maximum exposure to the sun. It should receive a minimum of 6 hours of direct sunlight everyday. It is best to position the greenhouse with the ends facing east and west. This will provide more heat gain from the sun during the winter and create less shadowing in the greenhouse. If the southern exposure is restricted, but open to the east, southeast, southwest, or west, turn the greenhouse to the winter sun. Remember the difference in sun angles from summer to winter (the sun is much lower in the winter).



Sometimes a shade tree can be an advantage, providing some shade for the greenhouse during the hot summer and letting the sun in after losing its leaves in the fall. The problem

with overhanging trees is one of falling branches that can damage your greenhouse.

2. Accessibility

You want your greenhouse to be easily used. A good site should be sheltered from high winds and easily accessible from your home and garden. Remember the need to move soil, plants, fertilizer, and yourself to and from the greenhouse. Access to utilities such as electricity and water are important requirements to remember also when selecting your site.

3. Weather

Many regions have chronic weather problems such as heavy rain, snow, and/or strong winds. Heavy rains may cause drainage problems in and around the greenhouse. To avoid standing water, choose a spot on high well-drained ground or install a drainage system before the greenhouse is erected. Snow is usually not a problem as long as you provide adequate insulation and heating. Strong winds can be a real problem. In cold weather, winds blowing over a greenhouse can drain it of its interior heat escalating energy costs. Windbreaks are your most effective weapon. A windbreak is an obstacle that "breaks" up the force of the wind. Trees, shrubs, fences, and other structures can all be effective windbreaks. Remember that a windbreak can also obstruct light. Try to locate one where it will block the least amount of light.

4. Ease of construction and maintenance

A level, well drained site will obviously be easier to work with and maintain than a low, swampy, or sloped area. It is also a good idea to locate your greenhouse away from children's play areas.

What's the Best Material for Greenhouses?

There really is no best material for a greenhouse. It is hard to know what's best when there are so many different materials used to make greenhouses. Aluminum, galvanized steel, wood, PVC, glass, fiberglass, polycarbonate, polyethylene, etc. They all have their place in greenhouse construction. Your needs and budget will determine which is best for you.

Greenhouse Coverings

Most important is the covering. It will determine the amount and type of light reaching your plants, the overall appearance of your greenhouse, its safety, ease of maintenance, and longevity.

Greenhouse Covering Insulation (R) Values			
4 mil polyethylene	0.83	4 mm twinwall polycarbonate	1.43
6 mil polyethylene	0.87	6 mm twinwall polycarbonate	1.54
6 mil poly double layer (inflated)	1.43	8 mm twinwall polycarbonate	1.61
11 mil woven polyethylene	0.95	10mm twinwall polycarbonate	1.89
3 mm glass (single layer)	0.95	16 mm triplewall polycarbonate	2.50
Two layers of glass (insulated)	2.00	Fiberglass / polycarbonate (single layer)	0.83

R value is a commercial unit used to measure the effectiveness of thermal insulation. A larger number represents a higher insulation value and therefore greater heating and cooling efficiency. Specific, brand-name, product R values may vary slightly from these figures.

- Glass -

The traditional greenhouse covering, preferred for its permanence and beauty. Glass is one of the least efficient materials for retaining heat, because it transmits heat and cold quickly and has very little insulating value (that's why it is used in cooking utensils and thermometers). Greenhouse glass should be double or triple strength to increase heating efficiency and decrease breakage which can be dangerous when installing as well as a problem in the completed greenhouse.

Glass is much heavier than other coverings, requiring more substantial framing. Other disadvantages include: it doesn't diffuse light, so there's a risk of burning plants; glass breaks more easily than the plastic glazings (important if you have hailstorms, trees nearby, kids that play baseball, etc.); and finally, slight deviations from horizontal and vertical frame alignment or settling of the foundation can crack it. Most glass greenhouses use either engineered aluminum, steel, or laminated wood frames with full foundations. Never install glass on breezy days. Because of the need for many smaller, overlapping, glass segments in these greenhouses, site selection should take wind into consideration. Air (heat) leakage is greater in glass greenhouses because of the many panes needed.

If you are unsure about your building talents, you might do well to avoid glass as the frame must be absolutely square and rigid. If you must have glass, consider hiring a contractor for your installation.

- Plastics -

These coverings include fiberglass, polycarbonate, acrylic sheets, and polyethylene film. All plastics resist hailstone damage and are shatterproof, a distinct advantage over glass. Rigid plastics are stiff, but not brittle. They can be flexed to fit over a curved surface and are available in large sheets. This reduces the number of potential air leaks by reducing the number of joints in the covering.

Fiberglass

The first of the practical replacements for glass, fiberglass usually comes in rolls or corrugated sheets and is translucent rather than transparent. You can't see through it but light transmission is roughly equal to glass. Fiberglass diffuses light that passes through it creating a virtually shadowless greenhouse. Fiberglass retains heat more efficiently than glass (but not as well as insulated plastics like multiwall polycarbonate or two layers of inflated polyethylene film) while transmitting less heat into the greenhouse, a benefit in both winter and summer.

Its corrugated form allows overlapping sides to seal well but its undulating ends can make for difficult joints. Aesthetically, the corrugations tend to detract from the structure and grime can collect in valleys. Greenhouse fiberglass is UV protected by a gel coat that will eventually be baked off by the sun lasting only about 6 years before turning yellow. When this happens, dirt accumulates among the glass fibers and becomes very unsightly.

Polycarbonate

One of the newest covering options, UV treated polycarbonate provides much of the clarity of glass and is stronger and more resistant to impact than other coverings. It is also more

resistant to fire than other plastics. [View picture of polycarbonate](#)

Polycarbonate is available in several different thicknesses and normally comes in single, double, and triple walled sheets with many structural walls separating its two flat sides. Single wall polycarbonate is the least expensive and is generally used for its attractive appearance, but it lacks the strength, heat retention, and light diffusing properties of double and triple wall polycarbonate. The multiwall structure gives it greater strength and superior insulating values with the air space built into the product. Multiwall polycarbonate also provides your greenhouse with an even diffused light that minimizes shadow and is optimal for growing plants. Another advantage of polycarbonate is its +15 year lifespan in most areas. Triple wall is rather expensive compared to other covering options, but it will pay for itself in reduced heating costs in cold climates that require frequent heating. The [Hobby Gardener greenhouses](#) are covered with a unique single wall polycarbonate. Double walled polycarbonate is used to cover the [Sundog greenhouses](#), [Sunshine greenhouses](#), and [Juliana greenhouses](#). [Cross Country greenhouses](#) are available with double or triple walled polycarbonate options.

Polyethylene Film

A favorite of commercial growers (about 90 % of all greenhouse sq. footage in the USA) because of its simplicity of maintenance. Use it for 2 to 5 years (life depends on poly thickness and UV treatment used) then recover with new poly. Used in single thickness, polyethylene film is good for simple cold frames and greenhouses used for starting seeds and other seasonal needs. When two layers are used, and the space between is inflated by a fan creating insulated air space, the polyethylene film retains heat more efficiently than glass houses, saving roughly 40% in heating costs.

Drawbacks to polyethylene film include a relatively short lifespan vs. other coverings, possibilities of rips and tears, and a translucent appearance much like fiberglass. Polyethylene's low cost, ease of replacement, high light transmission, and good heat retention have made it a favorite of nurserymen and commercial growers.

There are differences in polyethylene film. Cheap, thin films sold at many hardware stores and home centers are unsuitable for greenhouse use. Those films are designed as vapor barriers in home construction and other "interior" uses. Greenhouse polyethylene films are specially coated for protection from UV (ultraviolet) rays which shorten the lifespan of unprotected film. There's a minimal cost difference and a considerable difference in performance on your greenhouse. Polyethylene film is used to cover the [Little Greenhouses](#). The [Portable](#) and [FlowerHouse greenhouses](#) use a new woven polyethylene which is more durable.

Greenhouse Frames TOP

Most greenhouse frames are made from wood, aluminum, galvanized steel, and PVC. Which material is right for you depends a great deal upon where and how you will be using your greenhouse.

Galvanized Steel

Most commercial greenhouses have galvanized steel frames because they are long-lasting, low cost, and require less framework (thus less shadowing) than any other framing material thanks to steel's natural strength. Steel's greatest value in greenhouse construction is its strength. You want as much light to enter your greenhouse as possible and steel frames can

be thinner than others, creating less shadow. Its other big advantage is its low cost. Steel greenhouses are normally covered with polyethylene film because most frames are not designed to accommodate rigid panels without additional hardware. Be sure that any steel tube greenhouse you purchase is made with heavy-duty galvanized or stainless tubing which is made for outdoor construction purposes to protect it from a greenhouse's normal humid and corrosive (fertilizer salts) atmosphere.

Galvanized metals will eventually wear off their protective finish and rust from high humidity levels present in a greenhouse. Steel is much heavier than aluminum and generally requires additional hardware to mount a rigid covering to it.

Aluminum

Aluminum is used primarily in conjunction with glass or polycarbonate in architectural sunspaces and hobby greenhouses. It can be anodized in a variety of colors and has low maintenance requirements. Because of its higher initial cost, aluminum is most often used with glass and rigid plastic coverings in structures like the [Sundog greenhouses](#), [Juliana greenhouses](#), and [Cross Country greenhouses](#). Aluminum is the longest lasting of all of the framing materials mentioned because it will never rust, rot, or break down from UV rays.

Aluminum does not have the strength of steel so frame members either must be larger or more numerous. Look for engineered shapes in aluminum that are designed to increase frame strength, because you want as little frame shadowing as possible while not sacrificing the integrity of your greenhouse's frame.

Wood

Wood is most commonly used either for sunrooms or in homemade greenhouses. They are popular because of their attractive look, the ease in which accessories can be added to them, and the low amount of heat loss they produce compared to similar size metal frames. Wood frame structures are most often covered with a rigid plastic or glass. Though very attractive in sunspaces, wood has a limited lifetime in a greenhouse's damp atmosphere before it starts to deteriorate. Redwood (used in the [Sunshine greenhouse](#) frames) or cedar is recommended because of their natural resistance to the elements and insects. Applying a chemical sealant or stain to the wood periodically can also greatly increase the life of the material.

Wood frames are generally larger and heavier than equivalent metal frames which increases the amount of shadow in the greenhouse. Wood hobby houses are generally small scale with a limited ability to expand once construction is complete.

Plastic

Over the last 10 to 15 years plastic hobby greenhouses have become increasingly popular. The main advantages of these greenhouses is their low cost, portability, and ease of installation. Plastic is generally used to construct smaller structures because it is not as rigid as metal or wood, but the introduction of options like metal wire supports (included in [Little Greenhouses](#)) compensates for what plastic lacks in strength. Plastic frames have become increasingly popular because of the low amount of heat loss they produce compared to similar size metal frames. This is because plastic is a poor heat conductor like wood.

The main drawback to a plastic frame is that ultraviolet rays from the sun will eventually cause the plastic to deteriorate even if it is a UV protected material. UV protected PVC materials generally have a 20 year or better life. Plastic frames are also normally larger than equivalent metal frames which increases the amount of shadow in the greenhouse.

Rule of Thumb TOP

If you buy a greenhouse based solely on your current gardening expectations, it will probably be too small within a year!

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