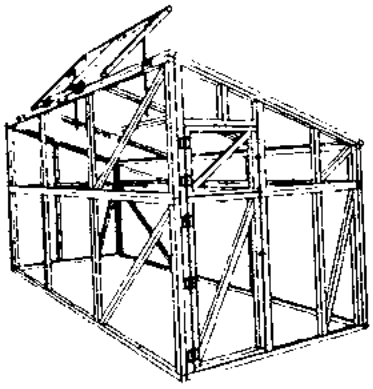
Design Plans for Hobby Greenhouses

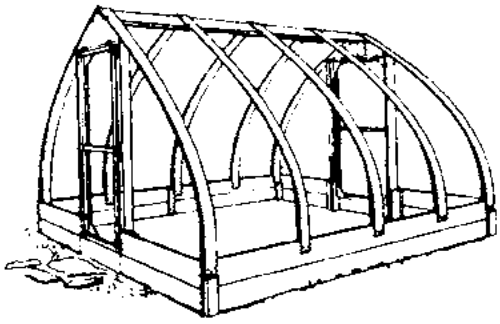
Detailed plans for the greenhouses illustrated in this information sheet plus many more are available from the Mississippi State University Extension Service online at ***http://extension.msstate.edu/publications/building-construction-plans/greenhouses***. Plans offered are adapted to hobby greenhouses.

Plan No. 5941. This is a two-page plan from which a greenhouse or coldframe can be built from preservative-treated 2-by-2-inch wood framing. Dimensions are 5 feet by 7 feet 8 inches. The greenhouse stands 7 feet 8 inches at the front and 5 feet by 7 inches at the rear. It has door and roof vents. The sloped roof can be raised 1 foot 4 inches at the front and 3 feet 4 inches at the rear for additional ventilation; framing is covered with polyethylene.



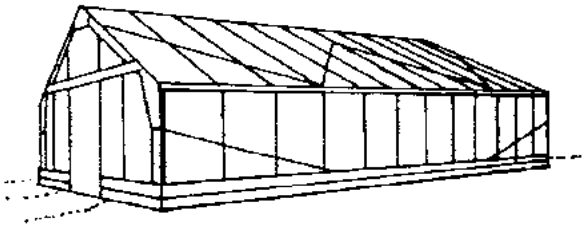
Plan No. 5941 – Coldframe greenhouse

Plan No. 5946. This is a one-page plan for an 8-foot 6-inch-wide by 12-foot-long portable greenhouse built with wood framing and a polyethylene cover. The gothic arch is 7 feet at the ridge with the arches formed by two ¼-inch by 4-inch by 8-foot bands of exterior-type plywood. The greenhouse is anchored to the ground by 2-by-4-inch stakes at each corner and door frame. The lower portion of the greenhouse is framed with two 1-by-8-inch strips of wood. The 2-foot by 5-foot 4-inch doors are detailed. There is a triangular vent flap above each door. The ridge boards are cut from 1-by-10-inch lumber on a 30-degree angle. Fastening the structure together with galvanized wood screws is recommended.



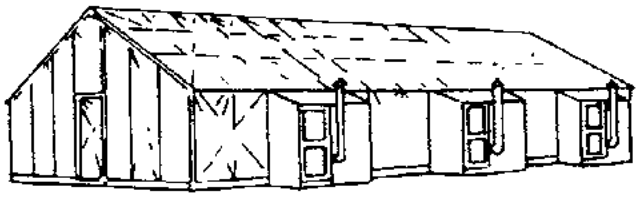
Plan No. 5946 – Portable plastic greenhouse

Plan No. 6029. This is a two-page plan for a 23- by 48-foot or 96-foot wood frame greenhouse covered with polyethylene or rigid fiberglass. The gable design house stands 6 feet 3 ¾ inches at the eave and 12 feet at the ridge.



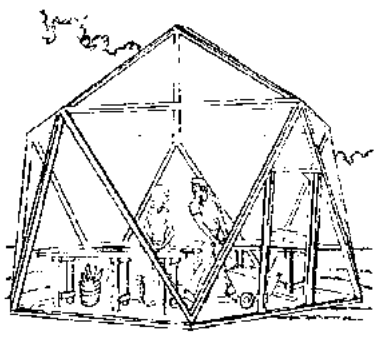
Plan No. 6029 – Framing

Plan No. 6094. A four-page plan for a 16-foot- and 26-foot-wide gable-style greenhouse of optional length. The 16-foot-wide house is constructed of 2-by-4 rafters and studs. The 26-foot-wide greenhouse is constructed of 2-by-6 rafters and studs in the sidewalls and by 2-by-4 studs in the end walls. The cover is polyethylene. Details are provided on bracing, doors, gussets, concrete piers, heating, and ventilating.



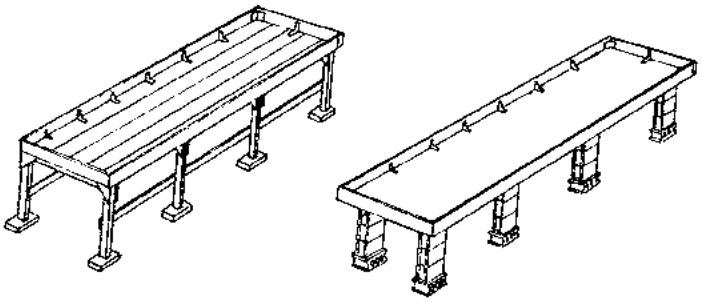
Plan No. 6094 – Plastic-covered greenhouse

Plan No. 6097. This is a three-page plan for a tri-penta greenhouse. The floor plan consists of a pentagon with 9-foot 8 ½-inch sides. The structure stands 13 feet 9 inches at the center peak. The 2-by-4 wood frame is covered with polyethylene. Details are provided for anchor joints, aerial joints, doorway and door, benches, and covering. Only experienced carpenters should attempt to build this greenhouse.



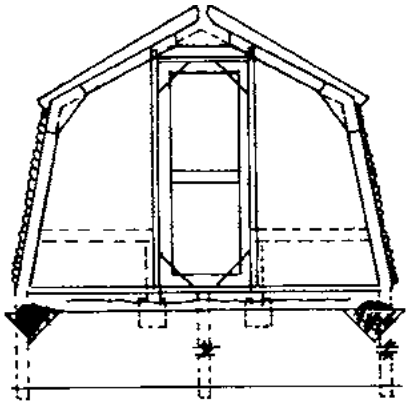
Plan No. 6097 – Plastic-covered house

Plan No. 6163. This is a one-page plan for six styles of greenhouse benches. Bench materials include welded wire mesh and wood.



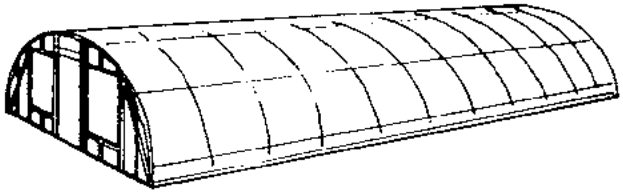
Plan No. 6163 – Greenhouse benches

Plan No. 6181. A two-page plan for a 10-foot-wide by 12-foot-long greenhouse built with a wood frame and a fiberglass or two-layer polyethylene cover. The plan includes details on benches, materials, and environmental controls. The house has a 2-foot 6-inch by 6-foot 3-inch door at one end.



Plan No. 6181 – Home greenhouse

Plan No. 6217. A two-page plan for a 20-foot wide quonset-style (also known as ground to ground) greenhouse of optional length. End framing is of 2-by-4s and 2-by-6s. Bows are ¾-inch conduits set in 1-inch pipe sunk in the ground. The polyethylene or fiberglass covered greenhouse stands 8 feet 6 inches at the ridge. Details include a bill of materials, a conduit bender, air inlet deflector, and a basic floor plan.



Plan No. 6217 – Plastic greenhouse, conduit frame

Plan No. 6222. This is a three-page plan for a pipe frame quonset greenhouse. The house is 96 feet 10 inches long, 28 feet 6 inches wide, and 11 feet at the ridge. Frame arches are 1 ¼-inch pipe. The cover is a double layer of polyethylene. Details include foundation corner, end wall head, inside frame for tomato vine support, tie-down cable anchor, inflation apparatus, and horizontal evaporative pad.

Plan No. 6222 – Pipe frame greenhouse

Construction Wood. All wood used in greenhouse construction should be a rot resistant (such as redwood). Pine and fir pressure-treated with a waterborne salt-type pressure preservative can also be used. Of the chemical wood preservatives, only copper naphthenate and wolman salts can be used in greenhouse construction. Wood preservatives (creosote and pentachlorophenol) give off fumes that are toxic to plants.

Greenhouse Covers. Many different materials are available for covering greenhouses. Although glass has the highest light transmission, and perhaps the best appearance, it is expensive and likely to be damaged by hail and other projectiles. Glass is seldom used in the Southeast.

Polyethylene (PE), the flexible plastic people are most familiar with, film has been used in large quantities for many years. It has high light transmittance, except in the ultraviolet region of the spectrum, and is transparent to infrared or long-wave radiation. Its **chief disadvantage** is its lack of durability. Be sure to use a film with ultraviolet inhibitor (UV or weatherable), or the PE film will last less than 1 year in the Deep South. Films can be bought with 3-, 4-, or 5-year lifespans. Cost increases with the lifespan of the film, so choose one that coincides with the time you expect to operate the greenhouse.

PE film is available in thicknesses of ⅛ mil or more (1 mil = .001 in) and in widths up to 50 feet folded or 16 feet unfolded. For a double-layer application, use 4 mil PE on the inside and 4 or 6 mil PE on the outside. Use 6 mil for single-layer applications. Use only unfolded PE, if possible, because film will fail first at the folds. If you are not using a multiyear PE film, you will have to replace PE film annually.

Polyvinyl chloride (PVC) is available as a film or as a rigid panel. PVC films last 4 to 5 years if properly maintained. PVC with an ultraviolet inhibitor has lasted up to 4 years. One disadvantage of PVC film is the difficulty in keeping it clean to maintain high light transmittance. Static electricity develops on PVC and tends to attract dust. PVC is available in ⅔-mil thicknesses and in widths of 36 to 72 inches (the narrow width is a disadvantage in covering large areas).

Rigid panels of PVC are inexpensive, easy to apply, and, when new, have high light transmittance. PVC's light stability is affected by heat build-up in the panel. If they are carefully applied and partially shaded during hot weather to prevent heat buildup, they will provide good service. They are available in 24- to 36-inch widths and in lengths up to 24 feet.

Polyvinyl fluoride (PVF) film is tough, durable, ultraviolet-resistant, and has high light transmittance, but is has a low transmittance for radiation from ambient temperature sources. It is available in widths up to 120 inches.

Polycarbonate is the newest of the plastic covers for greenhouses and in many ways is the best product. It has UV inhibitor, will last for many years, and is an easy attachment. It comes in single layers, corrugated sheets, or, for better insulation, in a double layer with ribs between the layers. While more expensive than the other plastic products, it lasts longer and is nearly indestructible and transmits nearly as much light as glass, yet is impact resistant to the point that it is hail-proof. It is available in 4- or 6-foot widths.

Fiberglass (FRP) has been used as a greenhouse covering for many years but is no longer a wise choice. Corrugated panels are in sizes up to 24 feet long with widths of 4 feet. Panels are flexible enough for use with various types of structures. Life expectancy of FRP is 5 to 10 years, depending on quality. The **major disadvantage of FRP** is that it deteriorates, losing light quality. The panels become etched and pitted, exposing the glass fibers. The fibers collect dust and fray, causing the panel to darken. Because of this, fiberglass is no longer recommended for greenhouse structures.

Another option is to cover your greenhouse with two layers of polyethylene, inflated and separated by a layer of air. This technique reduces heat loss and the amount of fuel used. A layer of polyethylene over corrugated or flat plastic also reduces heat loss and fuel use.

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