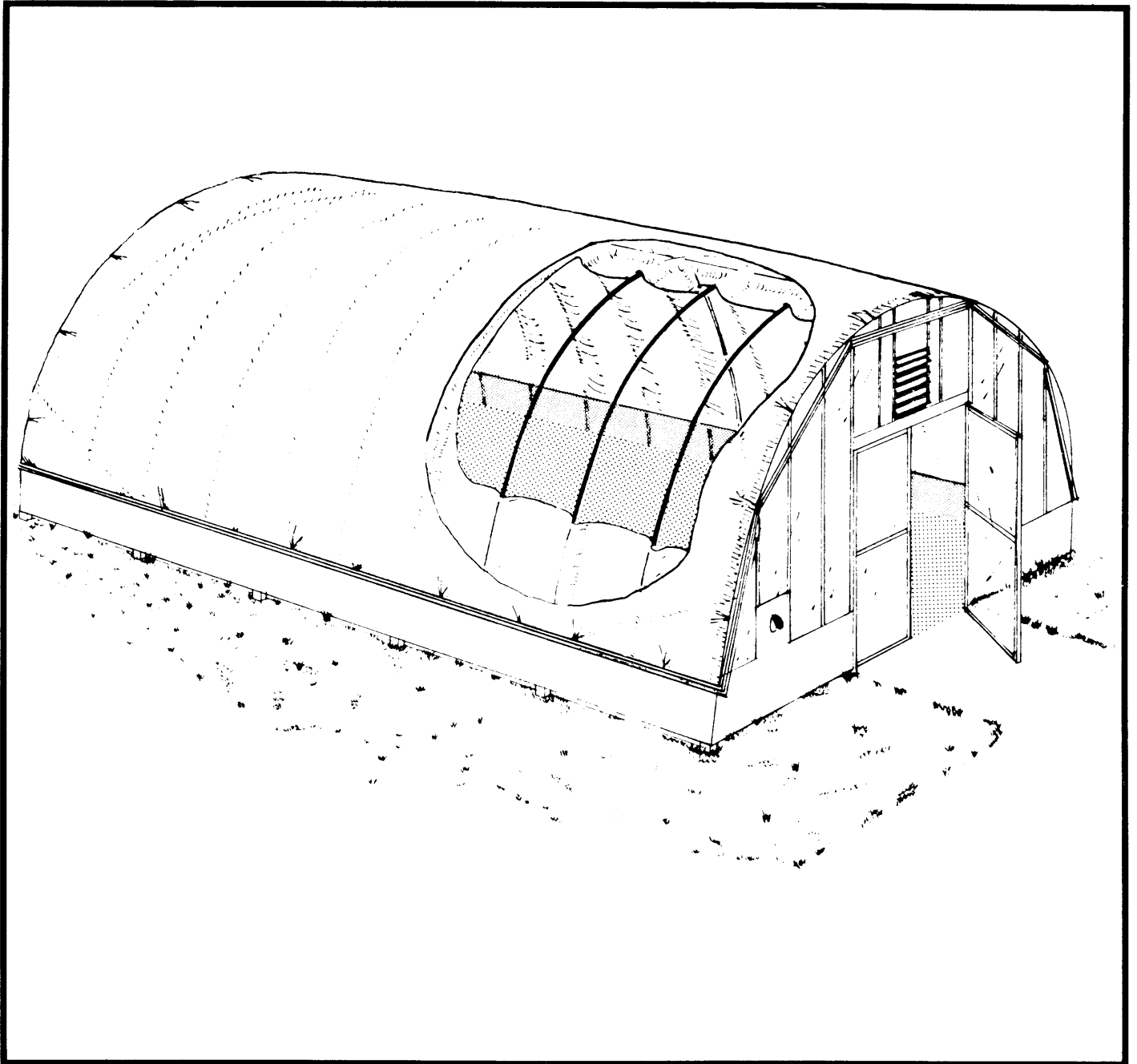


TWO-LAYER POLYETHYLENE GREENHOUSE



The Canada Plan Service prepares detailed plans showing how to construct modern farm buildings, livestock housing systems, storages and equipment for Canadian Agriculture.

This leaflet gives management information and describes one of these detailed plans. To obtain a copy of the Canada Plan Service detailed plan, contact your local provincial agricultural engineer or extension advisor.

TWO-LAYER POLYETHYLENE GREENHOUSE

PLAN M – 6720 REVISED 82 : 07

This plan gives details for a plastic-covered greenhouse for farm or commercial production of transplants and bedding plants. This greenhouse can be built to any reasonable length in multiples of 1.2 m, but the span is fixed at 7.8 m to use 12 m standard width polyethylene without splicing. Use two layers of 150 µm (6 mil) clear polyethylene (ultraviolet inhibited type).

Air is blown into the space between the two layers of plastic to maintain separation for heat conservation and to hold the outer layer tight for wind resistance. A small centrifugal blower draws air from outdoors to maintain the pressure and an air inlet control valve (or 2-speed electric motor) is used to adjust fan capacity. Greenhouse operators find that a blower static pressure of about 60 Pa (6 mm, water gauge) is adequate, except during windstorms when they increase the pressure to about 130 Pa. The polyethylene should be replaced each year at the beginning of the growing season. Double-headed scaffold nails and wood battens may be used to secure the plastic to the wood framing. Commercial fastening systems such as Poly-Lock' should also be considered for holding the plastic; these are available from the suppliers of the UV resistant plastic film.

SITE Choose a site with good drainage and some wind protection. When several of these greenhouses are to be erected, they can be built parallel to each other with enough space between them for snow removal, and all connected to a header house along the north end of the greenhouses.

FOUNDATION The building is supported on 89 x 89 mm wood posts embedded at least 1.2 m below ground, to resist wind and frost heave. Cedar has some natural rot resistance and is recommended for all wood in contact with the ground.

Another more durable alternative is CCA-pressure-treated wood. Do not use wood treated with creosote or pentachlorophenol as these are toxic to plants and are potentially dangerous to humans as well.

STEEL PIPE ARCHES Arches are bent from standard 1/4" galvanized steel pipe. Two lengths of pipe make one arch, and the plan shows a method of end connecting and wind-bracing the two halves of each arch. Some growers have been able to bend the pipe using a form anchored to the ground, but for best results the pipes should be formed on a roll bender available at most welding or machine shops.

END WALL FRAMING One or both ends are built with conventional wood studs, skinned both sides with polyethylene. Secure the outside plastic to the studs by nailing through 19 x 38 mm wood strapping, using double-headed nails for easier replacement.

VENTILATION AND HEATING A good ventilation system will be required to remove excessive heat in warm weather. Fan capacity will depend on the greenhouse length. For example, a greenhouse 7.8 x 28.8 m requires about 6000 L/s.

The type of heating system will depend on the operating period, greenhouse size, types of crops (inside temperature), the coldest weather expected (outside temperature), and the most economical energy source in your area.

In all but the smallest greenhouses, some type of heat distribution system will be required to provide uniform temperatures. Where several greenhouses are to be erected on the same site, they can be end-attached to a header house that provides a work area and furnace room. In this case, a central hot water or steam boiler is recommended, with finned-tube radiation in each of the greenhouses.