

Starting a Greenhouse Business



Producing greenhouse plants is one of the most specialized and intensive forms of agricultural production. Unlike agronomic or field-grown horticultural crops, where costs are on a per-acre basis, greenhouse crop costs are calculated on a per-square-foot or even per-plant basis.

Someone desiring to enter the greenhouse business needs a basic knowledge of the various facets of plant production. This knowledge is indispensable in propagating, potting, and marketing these specialty crops.

In addition to production knowledge, geographic location is an important consideration in making a decision for a greenhouse purchase. Some greenhouse crops may not be produced in certain locations because of the high costs involved in heating and/or cooling the greenhouse. A reliable source of good quality water is also a deciding factor in considering the greenhouse location.

Who Is the Customer?

As in all businesses, marketing is crucial to the success of a greenhouse operation. Knowing who the customer is and what his or her product preferences are dictate not only the mix of plants grown but perhaps the location of the greenhouse as well. Location determines if the greenhouse will be a retail center as well as a production center.

A retail establishment must be convenient and accessible to customers. Since a lot of the retail trade depends on “impulse purchases,” it is extremely important to provide an attractive environment for the customer. Providing the right mix of product types and sizes is also important in generating retail sales. For retail sales, larger container sizes of seasonal pot crops, bedding plants, and hanging plants such as ferns, color plants, and accessories are usually the best sellers.

You can determine the market potential for various types and sizes of plants by visiting florists and garden centers close to the location of a proposed greenhouse site. Also, consider recommendations from area landscapers and landscape maintenance services.

Producing for wholesale trade does not depend on location as much as producing for retail trade. Wholesale producers normally grow several different types and sizes of “prefinished” plants, such as bedding plants, seasonal pot crops, and foliage plants. Bedding plants are typically grown in cell packs, 4-inch pots, and 1-gallon pots. The larger sizes are marketed as “instant color.”

Since all products are produced for resale, you need a variety of crops and sizes. Focus on producing different cultivars within a crop—for example, different varieties of tomatoes or colors of poinsettias. A good evaluation of the market being targeted should provide some indication of the types and quantities of plants that you should grow.

Wholesale producers do not want to overlook opportunities to pursue “contract growing.” Growing under contract for someone else assures the wholesale producer a buyer before the plant crop is started. Usually prices and quantities are agreed upon before seed and other supplies are purchased. This type of production includes plugs, transplants, and prefinished seasonal crops.

Contract growing lets you concentrate on a few crops, but it narrows the market considerably, making you dependent on a small number of customers. Potential customers for contract growing include landscapers, maintenance businesses, and vegetable farmers.

Selecting a Greenhouse Structure

A Quonset-style greenhouse is the least expensive to construct, making it the choice for most growers, including those in Mississippi. The Quonset structure has few cross members allowing it not to interfere with light.

Several different types of coverings exist, including rigid acrylic and polycarbonate sheets. Fiberglass is no longer recommended because it scratches and yellows in a few years, greatly decreasing light transmission. Each of these coverings has its advantages, but they are all more expensive than polyethylene.

With polyethylene, often two layers cover the structure and are inflated with a ¼ to 1/3 horsepower squirrel cage blower to separate the two layers of plastic. Air is forced between the two layers of plastic to form a 4- to 6-inch air space which acts as an excellent insulation barrier that prevents heat from escaping during cooler temperatures. You can buy this type of covering that has been treated with an ultra violet (UV) inhibitor to slow the breakdown from UV light rays. A double layer of polyethylene decreases light transmission compared to a single layer, but the energy savings of about 30% are generally worth the tradeoff. Polyethylene with an antidrip agent added to resist condensation is also available. Remember, every chemical treatment added to the polyethylene increases its cost.

Construction Costs

To provide adequate gross income for a one-person business, a minimum of 5,500 square feet of greenhouse space is recommended. Construction costs vary, depending on the amount of work contracted and the types of materials and equipment used. When selecting construction materials, be careful not to sacrifice quality of the construction as a tradeoff for low costs. The same caution should be used to protect against overspending or buying more for the greenhouse than needed.

Table 1 lists cost estimates for the construction of a Quonset-style greenhouse covered with two layers of polyethylene, the style typically found in Mississippi. The dimensions of the greenhouse are 30 feet by 96 feet, for a total of 2,880 square feet. The greenhouse provides approximately 1,843 square feet of bench space or 64% of total floor space. The construction cost in 2019 for this type of greenhouse, fully assembled, is \$24,770 or \$8.60 per square foot. The growing space provided by a greenhouse

of this size is below the 5,500-square foot minimum that is considered necessary to be economically viable. Therefore, you should plan for at least two greenhouses with the size described in the table.

Areas for Cost Variance

You should consider load-bearing strength and life expectancy when buying the greenhouse frame. Galvanized steel tubing and aluminum tubing are strong and economical choices for a greenhouse frame construction.

Greenhouse flooring can substantially affect the cost. The greenhouse referred to in **Table 1** uses a black ground cloth or landscape fabric under the benches with gravel on walkways for the floor. Other floor options include bare ground, concrete, or fully-covered with gravel. Concrete floors significantly increase costs.

The greenhouse referred to in **Table 1** assumes that water and natural gas are readily available during construction. Some greenhouse locations may cost more if it requires drilling a water well and/or buying LP gas storage tanks.

Benches for growing plants can also increase costs substantially depending on the type of material used to construct the benches. Wooden frames with coated wire mesh surfaces, as estimated in **Table 1**, are reasonably inexpensive but less durable. Metal frame benches with moveable metal surfaces are more resistant to decay but can cost more than triple the wooden frame benches with investment costs starting at \$3 per-square-foot.

You should also consider the advantages and disadvantages of buying automated equipment for the greenhouse. Labor can be reduced depending on the level of automation you can afford to purchase. You should determine if the labor skills needed to operate the greenhouse are available or if labor will be difficult to find. Lack of reliable labor may make you consider investing in more automated equipment to eliminate potential labor difficulties.

Operating Costs and Cash Flow

The costs of building a greenhouse and buying equipment are not the only factors that should influence your decision to start a greenhouse business. You should also consider operating costs associated with producing the plants and fixed overhead costs. Business mistakes account for more failures than a lack of technical knowledge. Make and use operating budgets so you can establish and maintain financial control of the business.

Will the business produce a positive cash flow? This question is important to you and to the lending agency if you finance the venture with borrowed capital. Pay attention to inflows and outflows of cash. Make sure you will have enough cash to cover operating expenses to ensure survival of your business. Because of the nature of most wholesale greenhouse operations, the time between growing and selling the crop and the actual receipt of cash for the sale is critical to the cash flow of the business.

Greenhouse crops may require a year or more from the planting date until the crop is ready to sale. Costs associated with production will incur long before the crop produces any returns to the business. Consider the amount of operating capital needed to carry a crop through its full cycle and plan for any cash shortfalls. You can get this information from operating budgets. Be sure to have enough cash reserves to cover expenses until you collect cash receipts on sales.

Table 1. Estimated investment cost for a 30-ft by 96-ft, double-layered polyethylene, Quonset-styled greenhouse (2,880 sq. ft), Mississippi, 2019

Item	Unit	Quantity	Cost/unit	Total
Basic greenhouse package:				
Complete frame with 5-ft bow spacing	ea.	1	4,300	4,300
Double Cover, clear 6-mil UV Film (including inflation fan/blower and fastening system)	ea.	1	1,906	1,906
Heavy-duty storm door	ea.	1	380	380
Exhaust fan, 42" 2-speed, ¾ HP	ea.	1	1,140	1,140
Exhaust fan, 42" 1-speed, ¾ HP	ea.	1	1,140	1,140
Motorized gable shutter, 39"x39"	ea.	1	330	330
Motorized intake shutters, 57"x57"	ea.	2	480	960
Gas heater systems, 145,000 BUT	ea.	2	1,940	3,880
Horizontal Air Fan, 20"	ea.	4	150	600
1-and 2-stage thermostats plus hardware	ea.	2	140	280
Sub-total greenhouse package				\$ 14,916
Auxiliary Equipment:				
Lumber for perimeter base, treated 2"x6"	ft.	200	0.90	180
Lumber for end wall framing, treated 2"x4"	ft.	400	0.65	260
Black ground cloth, flooring and weed barrier	sq. ft.	0.08	2,300	182
Pea gravel for walkways, 7.5 cu yds	cu. yd.	1	270	270
Cooling pads cooling system with pumps/plumbing	ea.	1	1,130	1,130
Drip irrigation/fertigation system with controls	ea.	1	1,750	1,750
Wood bench frames with 14-gauge coated mesh wire tops, 1" grid	sq. ft.	1,843	1.50	2,765
Miscellaneous equipment:				
2.5-gal backpack sprayer	ea.	2	85	170
Backup generator (gasoline)	ea.	1	1,150	1,150
Sub-total auxiliary equipment				\$ 7,856
Assembly and installation**	hr.	90	16	1,448
Utility hookup (electrical, gas, and water)***	ea.	1	550	550
TOTAL				\$ 24,770
Per-square-foot				\$ 8.60

*Land cost and site preparation are not included in this example.

**Installation cost varies, depending on your ability to do some or all of the installation.

***Cost may increase if you need a water well for water supply and if you have to buy LP gas storage tanks.

Publication 1957 (POD-10-19)

By **Richard G. Snyder**, PhD, Extension/Research Professor, Central Mississippi Research & Extension Center, and **Elizabeth Canales**, PhD, Extension Professor, Agricultural Economics.



Copyright 2019 by Mississippi State University. All rights reserved. This publication may be copied and distributed without alteration for nonprofit educational purposes provided that credit is given to the Mississippi State University Extension Service.

Produced by Agricultural Communications.

Mississippi State University is an equal opportunity institution. Discrimination in university employment, programs, or activities based on race, color, ethnicity, sex, pregnancy, religion, national origin, disability, age, sexual orientation, genetic information, status as a U.S. veteran, or any other status protected by applicable law is prohibited. Questions about equal opportunity programs or compliance should be directed to the Office of Compliance and Integrity, 56 Morgan Avenue, P.O. 6044, Mississippi State, MS 39762, (662) 325-5839.

Extension Service of Mississippi State University, cooperating with U.S. Department of Agriculture. Published in furtherance of Acts of Congress, May 8 and June 30, 1914. GARY B. JACKSON, Director