

The Greenhouse Business in Kentucky

A Review of Crops and How to Begin a Business

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The greenhouse business in Kentucky is a successful small business enterprise. Approximately 1500 people derive all or part of their income directly from flower or vegetable production in greenhouses across the state. Plus, approximately 8000 people are involved in retail businesses that sell flowers and vegetables produced in the state's greenhouses.



The Commonwealth has about 140 acres of greenhouses that earn \$2.00 to \$20.00 gross income per square foot of greenhouse space per year. Large greenhouse businesses earn over \$1 million annually and small greenhouses add profit centers to farms, retail garden centers, and nurseries. Overall, the greenhouse business adds over \$40 million to the state's economy.

The greenhouse industry in Kentucky and the rest of the U.S. is quite large and over the last 30 years, greenhouse technology, crops, and markets have changed dramatically. The typical greenhouse has 3 primary crops: bedding plants in the late winter and spring, garden mums in the summer, and poinsettias in the fall. Spring bedding plants give greenhouse businesses their major cash flow and most profit. Profits are good and the market continues to expand at nearly 10 percent each year. The market for garden mums and poinsettias is smaller and highly competitive so most greenhouses break even on these crops. These crops allow greenhouse operators to pay their full-time employees for the calendar year.



In general, only a few greenhouses in the Midwest have production peaks in winter. Natural light levels are quite low and heating costs are quite high. In most cases, poor plant growth (because of low light) and high heating costs prevent economical greenhouse crop production in the middle of winter. The spring greenhouse with high light levels and moderate temperatures offer the best greenhouse conditions and that is why the bedding plant industry has such good economic performance.

Possible Crops

Any plant can be grown in a greenhouse. Many simple and complicated techniques have been developed over the last 100 years for plant production in a greenhouse. The first questions a new or inexperienced greenhouse operator asks are "Is there a market to sell a specific plant?" and "Can I grow a specific plant economically?" These questions have to be answered on a plant-by-plant basis, grower-by-grower basis and market-by-market basis. Although there is a large greenhouse industry in the U.S., the businesses are based primarily on marketing rather than production.

Over 500 species and cultivars of flowers and vegetable plants are grown in the state.

- **Bedding plants**, annual flower and vegetable transplants for residential and commercial landscapes, are the largest and most successful greenhouse crop. Bedding plants continue to offer the most sales, best returns on investment, largest profit center for all greenhouse businesses and best opportunity to new greenhouse enterprises. Kentucky-grown bedding plants meet 50% to 70% of the demand in wholesale and retail markets in every county of the state.



- **Garden mums** have become the primary summer crop for commercial greenhouse operators. In the last 20 years, mum production has increased from 50,000 plants to nearly two million plants in Kentucky. The market seems saturated for high priced mums but low priced mums, with a minimal profit margin, continue to increase. Garden mums are quite easy for a farmer to grow but the market is questionable.



- **Potted flowering plants** are produced in many greenhouses in the state for direct sales to the public and for wholesale sales to florists and supermarkets. Poinsettias are grown in greenhouses (and tobacco greenhouses) during late



summer and fall. These plants are the #1 potted flowering plant in the U.S. so the market is relatively large. Greenhouse operators have become quite efficient in poinsettia production so while the market is large, profits remain small. Poinsettias are moderately easy to grow, but might compete with tobacco harvest, housing, and stripping for farm labor. Poinsettias

are the largest crop; potted chrysanthemums, azaleas, cyclamen, gloxinias, tulips, Easter lilies, etc. are also produced

- **Cut flowers** are produced in less than 5 greenhouses in the state. Roses, snapdragons, chrysanthemums, etc. are grown for wholesale sales to florists and supermarkets. Competition in the cut flower market is fierce. Out-of-state - Florida, California, Colorado

- and foreign - Colombia, Ecuador, Netherlands, Israel, etc. - production fills 99% of the state's cut flower market.

- A number of businesses attempt to get into special market niches - **field-grown cut flowers, dried flowers, vegetable transplants**, but these comprise less than 3 % of the total business. Over 40 acres of greenhouses have been built for **tobacco transplants** in the 1990s. Some of these farmers use the greenhouses for other crops during other months of the year.

- The market for **landscape shrubs and perennials** continues to expand each year. The production of these plants fits the production schedule of tobacco transplants quite well, if a grower has an appropriate watering system. A farmer can purchase high quality liners (cuttings or plugs) for these plants in early summer (depending on the plant) and grow them in 1 or 2 gallon nursery containers. The plants can be over-wintered in the greenhouse and sold in the spring.



- **Greenhouse tomatoes:** Many tobacco farmers think of greenhouse tomatoes first when they consider other crops to grow in their transplant greenhouse. Most don't realize that greenhouse tomato production has been insignificant in the U.S. for nearly 20 years. The greenhouse tomato or hydroponic tomato market is increasing dramatically now. The U.S. consumer will now pay an increased price for a red, ripe tomato so investors are building greenhouse tomato businesses in a number of U.S. locations. It would be possible for small greenhouse tomato operations in Kentucky, on tobacco farms, to sell greenhouse tomatoes, especially direct to the public, in this expanding market.



- Greenhouse tomatoes are the most complicated greenhouse crop to grow. They require the most management, most labor and most sunlight of any crop. So a grower must be committed to this crop, over all other farm activities, in order to be successful. The best suggestion for a tobacco farmer who wishes to grow greenhouse tomatoes would be to use the greenhouse for tomatoes in the spring and grow tobacco transplants, a late crop, on outdoor beds.

- **Greenhouse cucumbers and peppers** require the same conditions as greenhouse tomatoes but have a much smaller market.

- The market for **strawberries** is very strong in the fall and winter because production can be limited in Florida and California. Although strawberry production systems have been designed for greenhouses, these systems are expensive and the low light levels in fall and winter greatly reduce yields. Additionally, little knowledge exists regarding the best cultivars, the best size plant to grow, the best source of plants, and how to manage potential insect problems.



- Certain **raspberry** cultivars are suitable for greenhouse production. These varieties produce flowers and fruit on the first year's wood and are called "primo-cane" varieties. Plants are grown in 2-3 gallon containers and irrigated with trickle irrigation. Additionally,



plants need to be supported so workers can move through the rows. Plants are stored dormant for 6-8 weeks in winter to get sufficient chilling, then can be brought to moderate (60° F) temperatures in the greenhouse. New canes will develop and produce flowers and fruit. This may be repeated 3-5 times during the summer and fall, depending on greenhouse temperatures. Workers in Canada and New York, who developed this procedure,

feel raspberries offer better opportunities than strawberries.

- **Leaf and bibb lettuces** are well adapted to the float system and tobacco greenhouses.

There are 20 or more specialty lettuces that have an increasing market in supermarkets and restaurants. Although the market is increasing, it is still not large. Lettuce can be grown in outdoor beds during late summer and fall, then moved into cool tobacco



greenhouses.

The plants can be grown in 'float' trays in

the same way tobacco transplants are grown. The biggest problem for lettuce is insect control. There are few insecticides cleared for this crop in the greenhouse. The use of insect screens would be very important to commercial production.



- **Herbs** are a specialized crop for any greenhouse in the state. The market is relatively small but those farmers who aggressively attack this enterprise can earn good profits. Most herbs cannot be grown easily with the float system; overhead watering will be required. Insect control will be a major problem and the use of insect screens would be important.

- **Greens**, such as mustard, kale, collards, etc., can be grown successfully just like lettuce in a tobacco greenhouse. These plants prefer cool conditions and can be grown at temperatures just above freezing. Yields will be good during the fall but yields will drop during the low light and cool temperatures of winter. Insect control may be a major problem.



Planning for a greenhouse business

The modern greenhouse business requires equal skill in plant production techniques and greenhouse management, business and personnel management and marketing. If you plan to have a successful greenhouse business, you must have or obtain these skills.

Information on these subjects comes from many sources. It is necessary to make your first investments (\$ 50. to \$ 500.) in written information, travel to visit local growers and travel to trade association meetings.

- Written Information
 - Subscribe to at least one trade magazine
 - Purchase reference books, extension publications (Resources and References for Commercial Greenhouse Operators, HortFacts 2-02) and association newsletters that review pertinent information on greenhouse production.
- Personal Conversations
 - Visit greenhouse operators across the state to determine what commercial greenhouses are like and what people in the industry think about the business.
 - Attend greenhouse association meetings and trade shows where you can visit with greenhouse operators and sales and technical representatives of greenhouse supply companies.
- Education
 - Enroll in high school vocational horticulture programs, post-secondary vocational programs, and undergraduate horticulture programs at the University of Kentucky or regional universities.
 - Attend national educational sessions sponsored by national greenhouse trade associations.
 - Attend business classes at community colleges or universities or educational sessions sponsored by the Kentucky Small Business Development Centers located across the state.
- Work Experience
 - Invest your time to learn about the industry by working in a greenhouse in Kentucky or another state.



While you collect the information necessary to operate a greenhouse business, you must evaluate the **resources** you will bring to the business.

- Financial Resources
 - The greenhouse business is capital intensive. Initial investments for a full time enterprise will be at least \$50,000; plus, \$50,000 to \$100,000 or more will be spent in the next year. Part time enterprises require less investment but return fewer dollars.
- Human Resources
 - Outline how much time you expect to give to the enterprise, who will accomplish specific jobs, and how much money you plan to earn from this business. The amount of money expected would be a key in determining how large an enterprise is necessary and ultimately the investment necessary.
 - For example, wholesale bedding plants return about \$1.00 per square foot to owner labor and management; thus an individual that wishes to earn a \$ 15,000 salary

must have approximately 15,000 square feet of greenhouse space that requires an investment of \$75,000 - \$150,000.

- Physical Resources
 - Land level enough for greenhouses.
 - Soil that is fertile and herbicide free if cut flowers or greenhouse vegetables are planned.
 - Accessible to the retail market if retail sales are planned.
 - Water source should have an acceptable analysis for year around irrigation (preferred water quality - salinity < 2.0 mS/cm (< 1,200 ppm); sodium < 70 ppm; alkalinity < 300 ppm).
 - Availability of fuel to heat the greenhouse.



The third step is to develop a **business plan**. All small business educators stress the importance of the business plan and the exercise of business plan preparation to anyone starting a new business. A business plan can be as simple as your verbal statement of what you will do and how you will do it. If you cannot afford to lose your investment in the greenhouse business, a detailed business plan is critical. The business plan allows you to operate your business on paper for 1 to 5 years to determine its' success.

- The business plan combines a market analysis, outline of appropriate crop production practices, and projected financial status of the enterprise. Most Kentucky greenhouse enterprises are quite different, thus there are few standardized budgets or business plans published. Review the budgets available at [Rutgers University](http://aesop.rutgers.edu/%7Efarmmgmt/Green-House/Greenhouse-Index.html), (<http://aesop.rutgers.edu/%7Efarmmgmt/Green-House/Greenhouse-Index.html>)
- Successful businesses achieve their own market niche through specific crops, facilities, markets and owner interest. As you complete your business plan, you will speculate on and possibly determine these characteristics for your business.
- Details of a business plan should be developed with the assistance of your County Extension Agent, the Kentucky Small Business Development Centers or the Extension Floriculture Specialist. The following outline reviews the parts of a business plan.
- Market Plan
 - Market Survey
 - A market analysis determines who buys greenhouse products in your local or regional market. Find all buyers of greenhouse products: ask them what they currently buy? What they can't purchase but need? Who currently supplies them? What are the current prices? Etc.
 - Visit your competitors. Determine what they do best? What are their specialties? What are their special facilities? Determine how they stay in business? Judge their status in the market.

- Results of Market Survey
 - Speculate on the market niche of your business. What crops can be sold? How much of each? Sold when? Sold to whom?
- Production Plan
 - Compile the production techniques for planned crops.
 - Utilize references books, extension publications, trade magazines.
 - Labor requirements for these crops.
 - Mechanization possibilities.
 - Identify the type of facilities necessary to produce the crops that will be sold.
 - Evaluate types of greenhouses and costs: \$ 1.50 - \$ 10.00 per square foot of greenhouse space.
 - Evaluate annual energy requirements and costs: \$.25 - \$2.00 per sq.ft. of greenhouse space per year.
 - Heating systems and costs: \$.60 - \$3.00 per sq.ft. of greenhouse space.
 - Ventilation/cooling systems and costs: \$.50 - \$2.00 per sq.ft. of greenhouse space.
 - Benches and costs: \$.75 - \$6.00 per sq.ft. of greenhouse space.
 - Irrigation and fertilization system and costs: \$.10 - \$1.00 per sq.ft. of greenhouse space.
 - Storage, office, packing, shipping space.
 - Transportation - trucks, vans, etc.
 - Retail sales area.
 - Prepare a proposed plant production schedule for 1 to 5 year period.
- Financial Plan
 - Decide salary and return on investment necessary from this enterprise.
 - Utilize example cost analyses for chosen crops and proposed costs of facilities to determine capital needs and expenditures over next 2 to 5 years.
 - Utilize proposed production schedules to outline monthly, quarterly or annual income from plant production for the next 2 to 5 years.
 - Develop a cash flow statement from these proposed costs and returns for the next 2 to 5 years.
 - Utilize business plan to obtain start-up and operating capital.



The business plan can be as informal as a verbal statement to your spouse or friend or as formal as a 10 to 30 page printed document. It should organize your thoughts and be an example blueprint for the future of your business. When a plan is set, greenhouse construction and the operation of the greenhouse business can begin. **No matter how good a price seems to be, do not purchase and erect a commercial greenhouse, before determining the market possibilities.**

General axioms of the greenhouse business:

- The greenhouse business is market driven. You must grow what buyers want to purchase.
- The greenhouse business is capital intensive.
- Greenhouse sales are highly seasonal - high income in spring, low income in summer, fall & winter. One must learn to manage a seasonal cash flow.
- Quality greenhouse plants always sell.
- Energy costs for greenhouses are only 10% to 20% of the total operating cost, even though it is generally thought to be much higher
- Kentucky's gas wells offer an interesting resource for greenhouses. But having a gas well is not sufficient reason to start a greenhouse business. It is better to have knowledge, resources and interest in the greenhouse business, and then move to land with a gas well.