Unit VII: Greenhouse Business Management

Lesson 1: Commercial Greenhouse Crops

This unit explains why planning a commercial greenhouse crop and developing a marketing plan are essential to greenhouse business management. Lesson 1 begins with an exploration of why specific crops are selected for production, justifies why a growing schedule is important, and summarizes the costs of producing crops. Next, the lesson explains how crops are evaluated and cared for after harvest and during marketing.

Selecting Commercial Crops

One of a greenhouse owner's most important responsibilities is selecting commercial crops that can increase profits. This decision is derived from the results of a market analysis that identifies the types of plants that customers want to purchase. (Lesson 2 describes how market research is conducted.) Visiting retail and wholesale operations, local nurseries, and landscaping outlets gives the owner a sense of what is popular. Profitability is a key concern. If a plant costs too much to produce (or if it is available elsewhere for less), the greenhouse owner probably would not select it.

Another way to discern the types, sizes, and amounts of plants the public wants is to read trade journals such as *Greenhouse Manager*, *Greenhouse Grower*, and *Grower Talks* and popular magazines (e.g., *Midwest Living*, *Better Homes and Gardens*, and *House Beautiful*). The greenhouse owner must also consider whether the staff can perform specific propagation techniques required for a new crop.

University Extension offices, state and federal agricultural agencies, and Internet sites provide data that can help the greenhouse owner determine which crops to grow.

Table 7.1 displays the wholesale value of Missouri crops that grossed $100,000 or more in 1999. Each of these crops is discussed below.

Table 7.1 - Missouri's Commercial Floriculture Crops

Crop	**Wholesale Value**	**Percent of Total**
Cut Flowers	$ 281,000	0.8
Foliage Plants	2,192,000	6.4
Potted Flowering Plants	11,711,000	34.2
Bedding and Garden Plants	20,085,000	58.6
TOTAL	**$34,269,000**	**100%**

Even though cut flowers represent the lowest percent of total sales, many retailers sell them in floral shops, malls, and grocery stores. The public frequently buys cut flowers for special occasions, such as roses on Valentine's Day, or just to brighten a room. In Missouri, the favorite cut flowers on the market are chrysanthemums, daffodils, gladioli, iris, narcissus, roses, snapdragons, tulips, and zinnias.

A greenhouse owner may choose to grow foliage plants because numerous species and cultivars are available, many of which are produced year-round. Potted foliage and foliar hanging baskets are the most popular in Missouri.

Some potted flowering plants, such as poinsettias and Easter lilies, are cultivated for special times of the year. Missouri greenhouse owners also raise African violets, azaleas, chrysanthemums, cyclamens, and kalanchoes. Some these potted plants are produced throughout the year.

In Missouri, bedding and garden plants have the greatest sales potential, capturing nearly 59% of

the total floriculture market in 1999. They are used for personal and commercial landscaping projects and are available for spring sales; some are sold during summer and fall. All-time favorites in Missouri include geraniums, hardy/garden chrysanthemums, impatiens (also New Guinea impatiens), petunias, and vegetable flats.

Determining Growing Schedule

Once the commercial crops are selected, the greenhouse owner develops a growing schedule to expedite production. It identifies when to plant each crop and perform cultural practices such as fertilization, irrigation, application of pesticides, and propagation. Aeration, drainage, day-length treatment, and date of harvest are noted as well. Postharvest procedures are also cited. Referring to cultural records enables the greenhouse owner to reproduce successful crops because potential problems are isolated before they have the chance to intensify and threaten the crops.

The growing schedule reflects when to check environmental conditions, namely, temperature, amount of light exposure, and moisture and humidity levels. Other pertinent conditions noted on the schedule include the types of growing media used, nutrient and foliar analysis, and an indication of whether diseases and pests are evident on the crops. Tracking these factors helps the greenhouse owner assess production costs, recognize nutritional deficiencies, and maintain healthy plants.

Management practices are also listed, such as dates for ordering/reordering supplies, shipping, and billing.

An important feature of a growing schedule is a crop rotation plan that helps organize the allocation of bench space throughout the year. An efficiently run greenhouse optimizes the number of planting benches and the space between plants. By knowing how much production time and space a crop requires for growth, the owner can maximize the planting cycles in the greenhouse and gain higher yields and profit. Plants should be spaced very close together when they are first transplanted, and then as they develop, they need more room between the pots. A crop rotation plan can also calculate the production time and space required per crop (as measured in square feet weeks).

- Determine how many square inches there are per flat. (Multiply the dimensions of the flat.)
- Convert square inches to square feet by dividing the total number of square inches in the flat by 144 (the total number of square inches per square foot). The result is the amount of bench space per flat in square feet.
- Multiply the amount of bench space in square feet by the number of weeks required to grow the plant.
- The result is the amount of bench space required as measured in square foot weeks.

Here's an example: A coleus flat is 12 x 24 in. and it takes 6 weeks to grow.

(1) 12 in. X 24 in. = 288 sq in.

(2) Convert square inches into square feet. (1 sq ft = 12 X 12 in. [144 sq in.])

(3) Divide the total number of square inches in the coleus flat by 144 sq in. (1 sq ft)

(4) 288/144 = 2 sq ft (amount of bench space per flat)

(5) 2 sq ft X 6 weeks = 12 sq ft weeks (amount of bench space required in square foot weeks)

Finally, the growing schedule names the person who is responsible for performing each task and notes when the task is completed. This provides

accountability and quality control for crop production.

Analyzing Expenses

All commercial enterprises incur two types of expenses: fixed and variable. Fixed (ownership) costs are paid regularly, regardless of the amount of sales. The major categories of fixed costs are depreciation, interest, repairs and shelter, taxes, and insurance. Applied specifically to greenhouse operations, fixed costs include the depreciation of greenhouse structures and equipment; interest on the land and building(s); repair expenses to maintain greenhouse structures, equipment, etc.; taxes on property; and insurance for employees and the greenhouse operation.

Variable (operating) costs change according to production level and amount of use. The major categories include labor (salaries), fertilizer, chemicals, seed, gasoline and oil, inventory, supplies, advertising, utilities, telephone, principal payment. When operating a greenhouse business, variable costs include labor (seasonal and full-time employees); fertilizer, rooting and growing media, and chemicals; seeds and plants; fuel for heating the greenhouse; inventory of growing and packing supplies (media, containers, and labels); advertising and display expenses; utilities, water, and telephone.

A cost analysis calculates the profit and loss of the operation and indicates the net return. A cost analysis statement records the amount of all variable expenses (designated directly to a specific crop) and the income received from all crops. For fixed expenses, a cost analysis provides the average weekly cost per square foot of bench space (including used and vacant benches). The formula is as follows:

Total fixed costs/52 (number of weeks per year)/sq ft bench space = average cost per week per square foot

For example, if the operation's total fixed costs are $15,000 and the total bench space is 20,000 sq ft, here is how to calculate the cost:

(1) $15,000/52 = $288.46 per week

(2) $288.46/20,000 sq ft = $0.014 per week per square foot

Evaluating the Commercial Crop

The greenhouse owner evaluates the quality of commercial crops before selling them to customers. Every plant must display adequate nutrients and fertilization for optimal growth and have sufficient water, aeration, and drainage.

Plants should have no yellow, broken, or dying leaves and must be free of insect damage. To appeal to customers, each container must be neat and clean and include a tag that describes how to care for the plant at home. Finally, potted plants are usually wrapped in attractive foil and displayed in a convenient location.

Caring for Commercial Plants After Harvest and During Marketing

After harvest, commercial crops require special care to ensure their ability to withstand stress and survive longer. Maintaining moisture is essential. The relative humidity must be kept at optimal levels. To offset water depletion during refrigeration, the storage area must be humidified. Keeping harvested plants away from direct heat and sunlight also protects them from moisture loss. Excessive heat harms the roots and leaves and dries out the growing media.

Regulating the respiration rate affects how well plants survive after harvest and during shipping. As the plants' food supply diminishes during respiration, crops deteriorate. Because high temperatures raise respiration, plants must be kept cool to reduce respiration, inhibit wilting, slow down metabolism, and hinder growth of mold and

bacteria. Cool temperatures also lessen the production of ethylene, which is a gas that hastens ripening. Air circulation lowers temperature and reduces ethylene concentration.

To stay fresh, cut flowers must build up their strength with enough carbohydrates. The greenhouse owner can maintain the quality of this crop by supplying the right amount of light and cutting the plants late in the day. The "vase life" of cut flowers is compromised if the following circumstances occur: the stems are blocked and cannot absorb water, excessive moisture escapes from the flowers, or respiration is suppressed because of insufficient carbohydrates. To extend the vase life of cut flowers, several commercial preservatives are available that consist of carbohydrates, bactericide, and an acidifier. The salesperson usually attaches a complimentary package of the floral preservative when a customer purchases a bouquet of cut flowers.

Foliage, potted flowering plants, and bedding and garden plants also need sufficient amounts of carbohydrates to sustain their strength. To increase plants' shelf life, the greenhouse owner lowers the temperature, reduces the amount of water, and decreases the amount of nutrients. Green plants receive less light. These procedures "harden" the plants, enabling them to adjust to new environments outside the protection of the greenhouse.

All crops should be handled gently and not touched more than necessary. Putting plants in protective containers with the appropriate amount of growing media keeps them secure. When loading plants onto trucks/vans for shipping, they should be secured in boxes and pallets.

During marketing, the storage and display areas should be kept cool. Every plant has a specific temperature at which its foliage, size, and overall condition remain optimal. But for every 18^{o}F increase above that temperature, quality deteriorates. Plants also need the correct amount of light and shade. If bedding plants are kept out of direct sun, the flowers maintain color and moisture is maintained. Only very small amounts of fertilizer are needed, if any. Watering is required only when crops exhibit stress. Placing plants on benches promotes air circulation, keeps them dry, and prevents soilborne diseases. And customers appreciate having easy access to elevated plants. Finally, a clean marketing area is not only conducive to pleasant shopping, it also limits ethylene production that results from decaying plants.

Summary

Planning a commercial crop begins with the selection of plants that will attract customers and promote sales. The greenhouse owner considers the sales potential of cut flowers, foliage, potted flowering plants, and bedding/garden plants. Once the selection process is complete, a growing schedule establishes when various cultural, environmental, and management practices should occur. The greenhouse owner must consider fixed and variable costs and prepare a cost analysis to determine the profit and loss of the operation. After the commercial crop is harvested, the owner evaluates the quality of each plant. Plants need special care after harvest and during marketing.

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Unit VII: Greenhouse Business Management

Lesson 2: Marketing Plan

After planning a commercial crop, the greenhouse owner must then devise a marketing strategy that promotes the merchandise. This lesson addresses three fundamental aspects of marketing: identifying customers, attracting their interest, and keeping records.

Identifying Customers

Defining the customer base depends on whether the greenhouse owner is selling to wholesale or retail customers. Wholesalers sell in bulk directly to businesses that sell the crops to other enterprises. The clientele consists of landscapers, nurseries, vegetable growers, florists, garden centers, chain stores, grocery stores, etc. They do not rely on the greenhouse wholesaler's sales personnel for advice, are not influenced by displays or advertising, and do not need customer parking lots. Each wholesaler has a small number of customers that usually purchases an entire crop all at once. Assorted crops and supplies are also bought yearlong.

Retailers sell relatively small amounts of plants to the general public in shopping areas, grocery stores, floral shops, malls, etc. These buyers may be tempted to purchase greenhouse plants from discounted wholesale outlets, which concerns retailers. Retail customers pay more per crop than wholesale clients. But retailers cater to shoppers by providing special services: informed sales personnel, attractive displays, and convenient parking lots (which cost retailers money). Patrons enjoy browsing throughout the greenhouse, so retailers have to adjust bench space and the height of displays. Although this reduces the size of the production area, retailers are often rewarded with satisfied customers who are likely to return.

One of the best techniques for identifying customers is to conduct market research. The greenhouse owner pinpoints likely customers by understanding the demographics of the area: income level, population, age ranges, employment sectors and amount of unemployment, characteristics of residential areas, and characteristics of housing developments (sizes and prices of lots). This information affects crop selection, price structure, and the advertising campaign. Chambers of commerce, realtors, census reports, telephone books, university Extensions, trade associations, media consultants, and vocational/technical schools are among the reliable resources for obtaining these statistics.

Market research also involves identifying the competition. The greenhouse owner gauges whether multiple operations are sustainable and determines if similar or different products and services are offered. Visiting retail and wholesale operations, local nurseries, and landscapers not only targets competitors but also reveals their inadequacies. For example, if a rival disregards the buying habits of young, working home owners, a greenhouse owner can seize the opportunity to appeal directly to this demographic group through advertising, special services, periodic sales, and extended hours. The location of competitors affects the greenhouse owner's site and crop selections and may also influence the customer base.

Attracting Customers

As soon as potential customers are identified, the greenhouse owner must figure out how to interest them in the merchandise. Advertising is a proven technique for generating sales. Direct mail, Web sites on the Internet, and various media (television, radio, magazines, newspapers, etc.)

suggest diverse methods for creatively promoting name recognition and supplying information about services in a visually appealing manner.

Displays in retail greenhouses attract attention if they are located within reach and are aesthetically presented. Greenhouse personnel should encourage browsing and be available to answer questions. Sales promotions for specific crops during the holidays, seasons, and special occasions also generate interest.

Competitively priced crops appeal to consumers. The owner must determine a reasonable profit margin based on what customers are willing to pay. Coupons and periodic sales stimulate commerce and draw attention to a wide range of customers.

Keeping Records

A critical element of developing a marketing plan for a greenhouse operation is maintaining up-to-date reports. A record-keeping system documents key events enumerated on the growing schedule and assists in formulating marketing decisions. The greenhouse owner (or business manager) should maintain financial records that track and categorize fixed and variable costs. Records of earned income include the following information:

- Number of plants sold
- Price per plant
- Grade of crops
- Date when each plant was sold
- Number of good, unwanted plants
- Number of poor-quality, unwanted plants
- Total all sales

Financial records are useful tools for assessing sales trends, and they enable the owner to readily detect which crops sell the most. These records also can be used to compare the amount of sales from previous time periods. This information can affect marketing strategies, crop selection, and inventory control. Various computer software programs are used to manage financial records, such as Quicken, Excel, Microsoft, and others.

Another type of record compiles pertinent employee information, including time sheets, salaries, hiring/firing dates, etc. A record that details expenses of mechanical systems incurred in the greenhouse (e.g., irrigation, electrical, and heating) is also important. Maintaining a current inventory helps the owner know when to reorder supplies and it facilitates smooth crop production. Software programs are often used to track and order materials.

Customer records with names, addresses, phone numbers, and credit/payment history should be on file. Adding a notation concerning clients' specific requests helps the owner ensure availability of favorite plants. Based on this profile, the owner can notify designated customers about services and new crops that will interest them.

As discussed in the previous lesson, the growing schedule incorporates information relating to environmental conditions, crop rotation, and cultural practices. The purpose of a greenhouse operation's record-keeping system is to compile, organize, and display up-to-date information for personnel who are responsible for specific tasks. Records of environmental conditions indicate the temperature, nutritional level of growing media, presence of insects and diseases, overall condition of plants, and amount of light. Computer software programs are available to predict temperature and energy use and to calculate concentrations of nutrients. As growers cultivate plants, they rely on details from this report.

A record listing the crop rotation schedule ensures maximum use of bench space for increased yield. This record designates which crops to grow during the year and assigns bench space per plant.

Another important record to post in the greenhouse itemizes various cultural practices per

crop. Among the entries on this report are planting dates; amount of day-length treatment per plant; irrigation, aeration, and drainage per crop; amounts, formulations, and dates of fertilizer applications; pest control methods; and dates of harvest per crop. New computer software programs are designed to graph soil tests and insect counts and to manage pest control.

Summary

Identifying the customer base depends on whether the greenhouse owner is a wholesaler or retailer. Different consumers are available in each sector. A market research study provides demographic information about the community that guides the greenhouse owner in targeting the client base. It is equally important to know who the competition is and to assess whether the market can support multiple operations. Advertising, nicely arranged displays throughout the greenhouse, and competitive pricing are proven techniques to attract customers. A well-developed marketing plan relies on a current and thorough record-keeping system that documents information from financial and personnel reports as well as the growing schedule.

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