

Starting a Greenhouse Business (Part 2)

Estimating Income Potential

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Producing ornamental plants in a greenhouse is a viable business opportunity for the individual with good management skills and the ability to take care of details. Greenhouse growing is physically demanding and is best suited for the person who likes to work with his or her hands. Before you begin a growing operation you must decide what to grow. Remember that you are growing for your customer, not for yourself. The best growers have an intuitive feel for what their customer will like – and buy. Read gardening publications, attend grower meetings and listen to your customers and gardening friends for any advice they can give.

What Should I Grow?

Obviously, to succeed you must grow what your customers will buy. Let's focus this discussion on the retail customer, because ultimately the retail grower and the wholesale grower are producing for this customer. Today the market is being driven by three important demands: color, newness and variety.

The demand for color means that the customer wants blooming plants when they buy them, typically between March and June. For the perennial plant grower, this means there is opportunity to either force summer- or fall-blooming perennials to bloom in the spring or, perhaps more logically, to use the same perennials to draw customers into stores during non-peak gardening periods. Also, because many flowering plants don't flower well in small pots, there has

been a shift towards larger plants in the marketplace. Another feature to the demand for color is the increase in demand for plants with colorful foliage. Plants such as the sun coleus, caladiums, hostas and cannas have become important in creating the colorful displays customers are seeking. This is an emerging area that is just now being tapped by a few growers. Patio plants, especially summer-flowering tropicals such as hibiscus, mandevilla and allamanda, have been showing strong growth in recent years. Butterfly gardening is a really hot item today, so any tie-in sales between flowering plants that attract butterflies would be easy to sell.

Customers also want new items, but what is new varies greatly between customers with different experiences and backgrounds. To one customer a new shade of geranium may represent newness whereas it may take an entirely new species to excite a more experienced gardener. Newness can be achieved easily by adding perennial plants to the product line. This group of garden plants is composed of thousands of potential items, and it will take years for gardeners (and growers) to try them all.

Variety is the spice that keeps greenhouse growers interested and is also the bane of their existence because increased variety makes management that much more difficult. In the early days of chain store development, the 80:20 rule was developed. This rule stated that

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80 percent of your sales came from 20 percent of your product. This means there are certain must-have items in any greenhouse operation. Table 1 attempts to list the most important items.

Table 1. Items that are high volume plants and important in every greenhouse operation.

Bedding Plants:

- Geraniums (4-inch)
- Impatiens (multiple cultivars to create the look of diversity)
- Petunias (new Wave series and Surfina are strong growers)
- Salvia (reds 80%, mixed other colors)
- Pansies (many types for autumn sales)
- Begonias (seem to be declining in importance)
- Coleus (Sun coleus types)
- Caladiums (4- or 6-inch pots)
- Tomatoes (the only high-volume vegetable bedding plant)
- Peppers
- Lantana (rapidly emerging cutting-grown plant for 4-inch sales, potential for larger plants)
- New Guinea impatiens (4- or 6-inch items)

Perennials:

- Hosta (a mixture of the better older selections and the new, higher-priced items)
- Daylilies (the reblooming types akin to 'Stella D'Oro' have reinvented this old perennial)
- Bleeding heart (while old, it is new to a surprising number of gardeners)
- Assorted ornamental grasses
- Any assorted perennials that bloom during peak customer traffic periods

Hanging Baskets:

- Boston ferns
- Impatiens baskets
- Lantana baskets
- Wave petunia baskets

Pot Plants:

- Geraniums (6-inch) (red/orange 80%, pinks 15%, white 5%)
 - Garden mums (premium quality for fall sales)
 - Poinsettias (some growers choose to close in the fall to avoid this crop)
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The items given in Table 1 only represent the most common greenhouse crops. Variety can be achieved by growing several cultivars of the same species, thus simplifying the growing operation. Every greenhouse in Arkansas will have the items listed above, but what makes most retail greenhouse operations different is what is chosen for the 80 percent of the items that produce 20 percent of the sales. Some operations choose to really promote their diversity while others downplay this aspect of the business. Greenhouse supply company salespeople can help fill in the gaps to provide a diverse and compatible product mix which will keep the attention of customers. But, the greenhouse manager must take an active part in selecting this product line to ensure its success.

How Do I Schedule the Crops?

Timing greenhouse production starts by deciding when you want the crop to be ready and then working backwards to determine the planting date. This process is aided greatly by the use of the week number system. In this system, the first week in the year is week 1, the last week is week 52. Many greenhouse crops are grown through the late summer and fall into the following spring and summer. Therefore, it is more practical to look at the week numbers from week 30 (the end of July) until week 52 and then week 1 back to week 30. For example, fern baskets might be started in week 40 and finished the next spring during week 10 for a total production time of 22 weeks. A basket item like a Boston fern is grown with no photoperiodic control – it simply takes time for the crop to grow to sufficient size to be salable.

Flowering plants can be scheduled to bloom at any season using week numbers. Rooted poinsettia cuttings are usually planted around week 36 and finished around week 47 for 11 weeks of production time. Poinsettias are a short day crop that initiates flower buds around September 20 as the days get shorter than 12 hours. Chrysanthemums can likewise be induced to bloom at any season by using photoperiod to trick the crop into blooming. For example, let's suppose we wanted a crop of chrysanthemums to bloom during week 30. Chrysanthemum cultivars are categorized into differing response groups, usually from 7 weeks for garden mums to 9 weeks for most pot mums to 10 or 11 weeks for cut mums. The response group is the weeks from the start of short days until flowering. So, using a 9-week response group, we now know that we would need to start short days on week 21. But, we can't just pop the cutting in a pot and start short days. We have to grow the plant some first under long-day conditions. With mums, plants are grown 1 week under long days after the pinch, so we would pinch on week 20. The cuttings are grown 1 week before pinching to establish the cutting; therefore, we would plant on week 19. A typical production schedule for a pot mum crop is shown in Table 2.

Table 2. A typical pot mum production schedule using the week scheduling method.

Week	Task
19	pot plants
20	pinch
21	begin short days
22	care as needed
23	care as needed
24	care as needed
25	care as needed
26	disbud or use center bud removal
27	care as needed
28	care as needed
29	stop fertilization, leach
30	plants in flower

Each crop which is planned to finish on a specific date in a different size container will need three columns. In the first column, list the number of units you would produce, in the second list the square footage per unit, and in the third record specific tasks that would need doing. Begin by deciding when each crop will be finished and count backward to the various tasks that need doing. For example, say you plan to grow a crop of 3,000 bedding plant flats (a 5-week crop from plugs) with 36 plants per flat and you plan to grow your own plugs using the 288 plug flat (a 4-week crop). You will also have 250 flats of tomatoes (a 6-week crop from seed) and 2,500 geraniums in 6-inch pots on 10-inch centers. Look at the schedule and determine the sales date and production steps for each crop. Use the built-in formulas of the spreadsheet to make the needed calculations. During weeks 12 and 13 we still have 275 sq. ft. of space available.

The secret to making money in a greenhouse is to produce and sell your crops at a profit. To do this

Once total indirect costs are calculated, those costs must be prorated to each individual crop so that these overhead costs are reflected in the actual cost of each crop. The method used to assign the indirect costs to a crop requires the calculation of the total indirect cost for a year. If you are projecting what you might make if you were to start a business, try to use as accurate an estimate as possible when developing these numbers. When total indirect costs are determined, then you must calculate the square footage of growing space available for production. This is bench space, not the total square footage of the greenhouses. Next, you must estimate how many weeks of the year the greenhouse will be full of crops. In the example used here, it is estimated that crops were being grown in the greenhouse during 40 weeks of the year.

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Table 4. Comparing the indirect (overhead) cost of three possible business scenarios assuming that the greenhouse had 6,800 sq. ft. of production space and a value of \$45,000.¹

Indirect (Overhead) Cost Item	Wholesale ²	Wholesale ³	Retail ⁴	Your Costs
Greenhouse depreciation (10 years)	\$4,500.00	\$4,500.00	\$4,500.00	_____
Interest on loan	4,400.00	4,400.00	4,400.00	_____
Repairs	1,000.00	1,000.00	1,000.00	_____
Insurance	800.00	800.00	800.00	_____
Office expenses	1,200.00	1,200.00	1,200.00	_____
Licenses and fees	100.00	100.00	100.00	_____
Delivery fleet expenses	2,800.00	3,900.00		_____
Management wages/benefits	25,000.00	25,000.00	25,000.00	_____
Labor (1.5 for wholesale/3 retail)	22,000.00	22,000.00	44,000.00	_____
Property taxes	500.00	500.00	500.00	_____
TOTAL INDIRECT COSTS	\$62,300.00	\$63,400.00	\$81,550.00	_____

¹ This greenhouse has the ability to produce 4,000 flats per “turn” (bench space turnover) in the greenhouse. Most greenhouses have two or three turns in the spring season.

² A wholesale greenhouse where you would buy seeds and grow your own seedling transplants and have two turns of greenhouse bench space in the spring.

³ A wholesale greenhouse where you buy plugs and produce three turns of greenhouse space in the spring.

⁴ A retail greenhouse where you buy in plugs but produce your own salable plants and market directly to the public.

Table 5. Calculating the cost per square foot per week to assign a proportionate share of the indirect (overhead) cost to each crop.¹

Indirect (Overhead) Cost Item	Wholesale ²	Wholesale ³	Retail ⁴	Your Costs
TOTAL INDIRECT COSTS	\$62,300.00	\$63,400.00	\$81,550.00	_____
Square feet of production space	6,800	6,800	6,800	_____
Weeks greenhouse in use per year	x 40	x 40	x 40	_____
Available square feet weeks	272,000	272,000	272,000	_____
	$\$62,300 \div 272,000$	$\$63,400 \div 272,000$	$\$81,550 \div 272,000$	_____
Cost per square foot per week	\$0.229	\$0.233	\$0.30	_____

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The more weeks the greenhouse can be kept in operation and full, the smaller the indirect cost charge will be for each crop produced. Multiply the square feet of production space times the number of weeks of production. Divide this number into the total indirect costs to get the **cost per square foot per week**. In the examples given in Table 5, the wholesale operation has a cost per square foot per week of \$0.23 while the retail cost is \$0.30 because of the higher labor costs.

Once the cost per square foot per week is determined, you can apply it to each crop equally depending on how long it is in the greenhouse and how many square feet it occupies. In the example given in

Table 6, the “from seed” crop is grown 8 weeks (8 weeks x \$0.23 x 1.5 sq. ft. per flat = \$2.76 indirect cost per flat) or \$21,988 for the 8,000 flats produced. The “from plugs” indirect cost amount is less because it occupies only 15 weeks of greenhouse time (3 turns times 5 weeks) or (5 weeks x \$0.23 x 1.5 sq. ft per flat = \$1.73 indirect cost per flat) or \$20,614 total indirect cost for the 12,000 flats produced.

To obtain the total cost of production, the direct cost items must be added that apply for each crop. If the records are available from previously grown crops, you will have good data as to what the cost for each direct cost item will be. The total indirect cost

Table 6. Comparing the direct cost of three possible business scenarios assuming that the greenhouse had 6,800 sq. ft. of production space and produced 8,000 or 12,000 flats of bedding plants.¹

Direct Cost Items	Wholesale ²	Wholesale ³	Retail ⁴	Your Costs
Indirect cost	\$21,988.24	\$20,613.97	\$26,966.91	_____
Flat and liner cost	5,600.00	8,400.00	8,400.00	_____
Media	2,880.00	4,200.00	4,200.00	_____
Seeds	2,000.00			_____
Plugs		22,680.00	22,680.00	_____
Fertilizer	800.00	1,000.00	1,000.00	_____
Chemicals	1,100.00	1,100.00	1,100.00	_____
Freight (inbound shipping)	1,360.00	1,850.00	1,850.00	_____
Heat (January to April)	3,600.00	3,600.00	3,600.00	_____
Utilities (January to June)	400.00	400.00	400.00	_____
Sales commission/advertising costs	3,200.00	4,900.00	7,200.00	_____
Other costs				_____
Total costs	\$42,928.24	\$68,743.97	\$77,196.91	_____
Number of flats sold (95%)	7,600	11,400	11,400	_____
Production cost per flat	\$5.65	\$6.03	\$6.77	_____
Sales price per flat	\$5.90	\$5.90	\$12.00	_____
Total number of flats sold	7,600	11,400	11,400	_____
Gross income from sales	\$44,840.00	\$67,260.00	\$136,800.00	_____
Total cost of production	42,928.24	68,743.97	77,196.91	_____
Profit (or loss) per square foot	\$0.02	(\$0.02)	\$0.66	_____

¹ This greenhouse has the ability to produce 4,000 flats per “turn” (bench space turnover) in the greenhouse. Most greenhouses have two or three turns in the spring season.

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items are added to the total direct cost items to obtain a total cost of growing the crop. Then, by dividing by the total number of units sold, an accurate cost of production can be determined. By using the units sold, any poor-quality plants or unsold plants would be accounted for as expense items.

By comparing the cost figures at the bottom of Table 6, notice that the grower actually loses money by using purchased plugs even though an extra “turn” is produced with that system. The price is converted to profit per square foot to allow a comparison between cropping systems. By making this conversion, you could compare the profit generated by products of different types, such as flats, 4-inch pots and 6-inch pots.

The wholesale price of bedding plant flats has been falling in recent years and has averaged between \$5.60

and \$6.50, so the \$5.90 assigned here is realistic. The price of \$12.00 per flat is a realistic retail price for bedding plants. Because the retail price is so high in comparison to the cost of production, the grower has a much higher potential of producing a profit in a greenhouse operation.

Also, notice that the manager’s salary – presumably your salary – is included in the indirect cost figure. As the operator, you might choose to not take a salary the first year or two while the business gets up and running, but it should be accounted for in your cost figures to accurately portray true production costs. The profits generated in this example are true profits and could be applied to expand the business, as a bonus to the boss and employees, or to retire debt assumed during startup.

How Can I Be Most Efficient?

The easiest way to improve the bottom line situation for any business is to attack the big ticket items first, but also keep an eye on the smaller expense items to make sure you are not paying too much for any of the production inputs. In the example given for retail sales in Table 6, the big items in production are the cost of plugs (29 percent), labor (21 percent) and flats and soil (16 percent), whereas heat is 5 percent and fertilizer is 1 percent. To maximize economic efficiency, the big ticket items must be squeezed first. For example, it appears that the cost of plugs is too high, so this could be reduced by growing your own plugs or shopping around for a more economical source. Too often people start with low input items like fertilizers and switch to a less expensive and maybe less desirable type without addressing the most significant issues.

Usually labor costs are the biggest single part of most greenhouse operations. Greatest labor usage, at least as it relates to plant production, is in order of significance: watering crops, pulling and packaging plants for shipping, planting and transplanting and providing care as needed.

Any attempts at automation to reduce labor inputs must start with reducing the time spent on watering. Studies have shown that many watering systems will pay for themselves within one growing season. Hand watering costs about \$0.80 per square foot per year whereas tube watering systems cost about \$0.40 per square foot to install and can be used for several years. Overhead sprinkler systems are the least expensive at \$0.20 per square foot, but they are not suitable for many greenhouse crops. Boom watering systems cost about \$1.25 per square foot and are efficient on bedding plants and non-blooming ornamentals. Capillary mat watering systems cost \$0.40

per square foot to install and are usually effective for two years. Trough flood systems usually cost around \$2.00 per square foot while the most permanent system, the flood-floor system, costs about \$4.50 per square foot.

The second most important way of saving labor is to develop efficient ways of handling plants and materials. Many kinds of systems are available for moving plants to and from production areas, but they can be quite expensive. A good site layout and a wide central aisle is a starting point for most of these systems. Much overall efficiency can be gained by considering materials handling before the greenhouse layout and construction is started. Soil handling equipment falls in this same category and should be one of the early phases in automation.

Seeding and transplanting equipment is available and is the latest in the way of bells and whistles for greenhouse production. These expensive systems can only be justified for large operations and probably would be difficult to justify in most cases for the small retail grower. Much of the high-tech equipment is changing so rapidly that it must be depreciated out in two or three years to justify owning it. This quick rate of depreciation makes owning most pieces impractical.

Conclusion

Greenhouse production can be a profitable venture if you are a good manager and pay close attention to providing what the customer wants. It is a seven-day-a-week business, especially during the busy spring season. Unlike a franchise hamburger restaurant, greenhouses are not easy to operate by a predetermined formula so the manager must spend a great deal of time, especially during the start-up period, seeing to the details of the business.

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