PRICING CONTAINER GROWN PLANTS[1]

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Abstract. **There are many different ways to determine a price for container-grown ornamental plants. Many nurserymen price their plants without knowledge of their actual cost of production. Calculating the cost of production can be complex if various sizes of containers are being used and numerous varieties are under production with varying growth rates.**

This paper outlines a simple and practical solution to the nurseryman's pricing problem. It can also be used to determine whether or not a particular plant can be grown, with a profit, given the prevailing sales price of competitors.

Introduction

Various methods have been used to determine prices for container-grown ornamental nursery plants. One of the most frequently used pricing methods is to use competitiors' prices as a guage, and then set the price at the same level or slightly below. Pricing in this manner assumes: (1) that competitors know their production costs and are pricing plants to cover these costs, and (2) that production costs will be the same or less than competitors'. If either of these assumptions is wrong, money could be lost on each plant sold.

Even if a profit can be made by using competitors' prices as a guide, how should prices be adjusted when faced with rising production costs? A reecnt comparison of published prices in 1971 and 1974 issues of a nursery trade magazine indicates that competitors' prices may be misleading:

	1971 Price	1974 Price
1 gallon hibiscus	$ .85	$1.00
1 gallon crown of thorns	1.00	1.00
3 gallons ligustrum	2.00	2.35
1 gallon red ixora	.95	.85
1 gallon arborvitae	1.00	.85

The price changes indicate that different nurserymen reacted in various ways. Some of the price changes may not have yielded increased profits, particularly during a period when nearly all costs have increased.

Another popular pricing policy of nurserymen is to increase prices on all plants a given percentage every 12 to 18 months. This policy assumes that changes in production costs affect plants of all types in the same way, which is very unlikely. Therefore pricing by this method cannot truly reflect differences in the changes in actual production costs among varieties and across container sizes. Production costs can be used as a key to pricing.

Production Costs

Calculating production costs in a nursery can be very complex when many different kinds of plants requiring different care are grown in various container sizes over different lengths of time from potting to sale. The following is an example of a simplified method of calculating production costs which can be used to establish prices.

Assume that the cost of producing a plant in a typical seven-gallon container is to be calculated. For a plant of this type, the following cost might be incurred:

Container	$2.00
Fertilizer	.08
3 gallon transplant	3.75
Soil	.30
Labor[2]	1.35
Total	$7.48

What would happen if the price was based on this $7.48 cost estimate? One thing that would happen is that the price would be too low. Why? Because there are many costs that are associated with operating a nursery that aren't included in this estimate. For example, the estimate did not include depreciation, telephone, electricity and many other expenses that must be paid.

Direct vs. Indirect Costs

It's no accident that these "overhead" costs were left out of the estimate. Overhead costs seem harder to deal with, and in the minds of many nursery managers are best left to the bookkeeper. To price nursery plants accurately and fairly, distinguish between *direct* and *indirect* costs.

If a particular cost item changes depending on the type of plant being grown, then that item is a

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[2]Labor includes potting, fertilizing, pruning, weeding and loading for sale.

direct cost. For example, the cost of liners varies among plant cultivars. Similarly, weeding costs for a one-gallon and a three-gallon plant will not be the same. Therefore, liners and weeding are direct costs. Generally, the direct costs for a nursery will be: containers; liners or transplants; soil; fertilizer; and labor to pot, fertilize, prune, weed and load for sale.

On the other hand, indirect, or "overhead", costs will remain about the same regardless of what plants are grown on a given area. For example, no matter what plants are grown, plastic is usually put down to control weeds between containers. Advertising and insurance bills will probably not change. Depreciation on buildings and equipment also continues at the same rate whether ligustrum or juniper is grown. Therefore, all of these cost items are indirect costs.

Figuring Indirect Costs

The annual account items for a five-acre nursery might look something like this:

1. Operator's salary	$ 13,500
2. Other wages and salaries	37,937
3. Plants and seeds	7,760
4. Cans and other growing containers	10,196
5. Peat, soil, shavings, etc.	4,437
6. Fertilizer and lime	2,139
7. Pesticides and other chemicals	1,096
8. Other production supplies	1,060
9. Repairs and maintenance	3,534
10. Equipment operating costs	1,681
11. Travel and entertainment	796
12. Insurance	2,020
13. Telephone	997
14. Electricity	872
15. Taxes, licenses and bonds	2,213
16. Advertising	1,421
17. Rent-land and/or buildings	1,800
18. Other cash expenses	6,359
19. Depreciation on buildings, machinery, equipment	4,138
Total	$103,956

It's fairly clear by the definition that accounts 3, 4, 5 and 6 are direct costs, and accounts 11-19 are indirect costs. Account 8, being mostly plastic ground cover and shipping supplies, is also an indirect cost. Accounts 7, 9 and 10 are best grouped with indirect costs, even though strictly speaking they don't belong there. That may be true, but calling them indirect costs makes them much easier to use without sacrificing accuracy.

In addition to the costs itemized in the example accounts, a charge should be made for the use of the capital involved in operating the nursery. The total amount of capital involved includes: (a) the estimated value of plants held in inventory, (b) the estimated value of supplies on hand, (c) the book value of the land, and (d) the depreciated book value of all buildings, machinery and equipment. For a typical five acre container nursery, this could amount to $136,000. If it is assumed that 10 percent is an appropriate rate to charge, this yields $13,600 of additional indirect cost. Notice that this figure is used instead of any actual interest paid on loans or mortgages, since this method accounts for all of the invested capital rather than just that on which interest is being paid.

This leaves only the first two accounts. Even though labor costs for potting, fertilizing, pruning, weeding and loading plants are direct costs, not *all* labor is a direct cost. Labor *is also required*, among other things, to maintain roadways, keep books, and to obtain supplies. This part of the labor cost is an indirect cost and should be included as such to avoid underestimating production costs. These can be obtained by estimating what percent of the operator's salary and the total labor costs should be assigned to indirect costs.

For this example, assume that 20 percent of the operator's salary will typically be a direct cost, the remaining 80 percent to be allocated as an indirect cost. Of the other wages and salaries, 65 percent of them might be directly involved in producing the plants. Using these percentages, the total annual indirect cost for the nursery can be obtained.

Operator's salary (80% of $13,500)	$10,800
Other labor (35% of $37,937)	13,278
Capital charge @ 10%	13,600
Sum of accounts 7 thru 19	27,987
Total indirect cost	$65,665

Using Indirect Costs

Once the annual indirect costs have been estimated, the logical question is "How should they be used in pricing individual plants?" Fortunately, this turns out to be a relatively simple process. The total square feet of production area will be needed. Continuing the example of a five-acre nursery, suppose that there are a total of 96 blocks, each with an area of 1500 square feet. This means that the nursery has a production area of 144,000 square feet. This is only that area actually available for the production of container plants; areas used for such purposes as roadways, soil mixing, and storage sheds are not included.

Dividing $65,665 (the total annual indirect costs) by 12 puts it on a monthly basis and then dividing that result by 144,000 (the number of square feet in the production area) yields $0.038. This means that there is an indirect cost of 3.8 cents per month for each square foot of production area, regardless of what type of plant is being grown in that area. This cost needs to be reflected in the price of the plant.

Recall that there was a total *direct* cost of $7.48 per seven-gallon container. In many nurseries, seven-gallon containers occupy about five square feet each, including the space between containers. Of course, the space occupied will vary depending upon the variety of the plant; in this example five square feet per container will be assumed. Assume this particular container will be in the nursery for 18 months from the time it is potted until it is sold. The indirect cost associated with it can be calculated.

With 3.8 cents per square foot and five square feet per seven-gallon container, this makes 19.0 cents per container per month. Since the container will be in the nursery for 18 months, the total indirect cost is $3.42 (18 times 19¢) for the seven-gallon container.

The total growing cost for the plant is then simply the sum of the $7.48 direct cost plus the $3.42 indirect cost; $10.90 is the total growing cost of the plant in the seven-gallon container. Of course, if the spacing is such that seven-gallon containers occupy something other than an average of five square feet or if 18 months is inappropriate, simply substitute the correct figures.

Some factors that affect profit will be discussed, but first the total growing cost of another kind of plant will be calculated. This time, assume a one-gallon container and a plant that will be ready for sale in six months after potting. The direct costs associated with this particular plant and container are as follows:

Container	$0.13
Liner	.22
Soil	.02
Fertilizer	.01
Labor to pot, fertilize, prune, weed and load for sale	.29
Total	$0.67

Now, the indirect costs are needed. A one-gallon container typically occupies about one square foot. Using the 3.8 cents per square foot per month obtained previously, multiplying it by one square foot and then by six months yields 22.8 cents per one-gallon container. Combining this indirect cost with the direct cost shown above, the total growing cost is 90 cents per one-gallon container.

Three Factors Affecting Profit

The total growing cost for each type of plant obtained above is the absolute minimum price that should be charged for that plant. The price actually charged should reflect an estimate of a fair return for the capital investment and the risk involved in growing nursery stock. It is important that the price set is reasonable when considering competitors' prices and the demand for each particular plant. If the total growing cost significantly exceeds competitors' prices, elimination of the plant from the production scheme should be considered. Alternatively, a method of reducing the total growing cost per plant could possibly be devised. In addition to these considerations, there are three others that merit some thought: profit potential, space, and plant losses.

Profit potential. If the total growing cost is substantially below competitors' prices, there may be an opportunity to make some profit beyond what could be normally expected. It would probably be best to set the price relatively close to your competitors'. Ideally, each different plant and container size should earn the same profit per square foot of production area during the same period of time. Of course, those plants with the greatest profit potential should be selected for production.

The profit potential of each plant will vary with the length of time required for production. For example, consider two plants, one which can be produced on one square foot in one-gallon containers in six months and the other on five square feet in 18 months in seven-gallon containers. If each is marked up by the same percentage, say 20 percent above the estimated total growing cost, then the profit per square foot of production area will not necessarily be the same for both plants. If the mark up for both sizes of plants is 20 percent, this means that profit of 18 cents (90¢ x 20%) on each one-gallon container and $2.18 ($10.90 x 20%) profit on each seven-gallon container will be made. This would make the plants sell for $1.08 and $13.08 each. In the five square feet occupied by the seven-gallon container, the profit would be $2.18 at the end of the 18 months. Alternatively, that same five square feet could be used for five one-gallon containers. The five one-gallon plants could be sold every six months for a total of 15 one-gallon containers sold at the end of 18 months. The profit from these 15 one-gallon containers would be $2.70 (15 x 18¢) or 52 cents more than with the larger plant. It would take a mark-up of nearly 25 percent on the seven-gallon plant in order to be as profitable as a 20 percent mark-up on the one-gallon plant in the example.

Space. Each square foot of nursery production space incurs exactly the same monthly indirect cost regardless of how it is used. The total growing costs estimated by the above procedure will be accurate only if all the production area is in constant use. If part of the production area is left vacant for a short period of time, the costs estimated by the above method will be too low. This will cause the profit to be lower than you might anticipate. Vacant space in the production area is quite common immediately after a group of plants has been marketed and replacements have not yet been potted and planted in the nursery. For example, if it typically takes six months to grow a plant from potting to sale and it then usually takes another month before the space is refilled, figuring seven months (six months growing plus one month idle) when calculating the indirect costs will allow for the idle nursery space.

Losses. During the course of the growing period, it is quite common for some plant losses to be incurred. Over-fertilization or insect infestation are just two of many possible reasons why some of the plants might die. Dead plants, unfortunately, incur costs but do not generate sales revenue. Suppose, for example that a 10 percent loss might be expected for a block of one-gallon container plants. This means that the total cost may be roughly the same as though all of the plants lived but the sales revenue would be 10 percent less. Losses can easily be allowed for by dividing the total growing cost per plant by the expected *survival* percentage, and then use the result as the growing cost. In the example of one-gallon cans above, the 90 cents growing cost can be divided by the 90 percent expected survival rate to get $1.00 ($0.90/0.90).

Summary

Using accounting cost items, nurserymen can divide them into direct and indirect costs as a beginning step towards pricing ornamental plants. The indirect costs will need to be expressed in terms of the total number of square feet in the production area and then on a monthly basis. The appropriate direct costs plus the monthly indirect cost, adjusted for the growing period, can be used as a basis for establishing prices. Allowances can be made for plant losses, profit potential and vacant space. This method makes it easy for nurserymen to accurately reflect total growing expenses in the plant price.

COMPETITION FROM CUT FLOWER IMPORTS

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Abstract. **Cut flower imports into the United States from Latin America have risen at geometric rates over the past five or six years. In 1973 approximately 14% of the domestic supply of carnations, pompon chrysanthemums, and standard chrysanthemums came from imports. Colombia is the main foreign source for each of these flowers. The supply (domestic production plus imports) of carnations rose 62% from 1966 to 1973 while similar supply increases for the two types of chrysanthemums were much less. The 44% increase in pompon supply compared with one of 20% in standards. Lower wholesale prices of carnations and chrysanthemums have been associated with increased supplies Multiple correlation analyses, in which the price of a flower was related to its supply, the price of a competing commodity and an index of the price level, were done for carnations and pompon chrysanthemums.**

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Perhaps the major factor which has characterized the commercial cut flower industry in the United States during the past five years has been the very rapid growth of cut flower imports from Latin America (3, 4). Large quantities of carna-