How can you make your greenhouse greener?

Growing the highest margin crops can add a lot of profit to your pocket, but only if you can identify those crops that bring good margins.

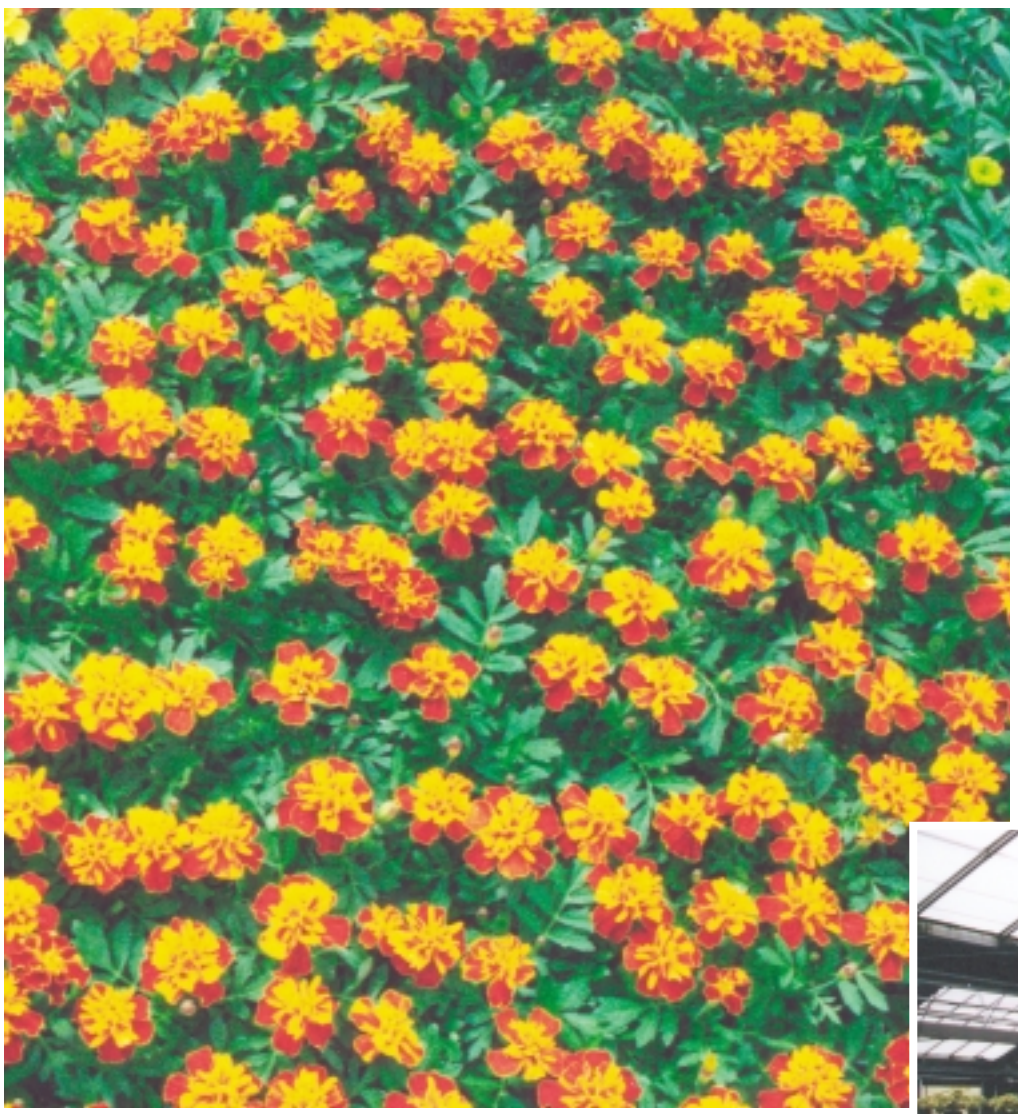
By Robin G. Brumfield

All of you know whether or not your business is making money. But do you know which individual crops are making money and which ones are losing money? Or more optimistically, if you are making money on everything, do you know which crops make the most? Once you know this, you can look at ways to increase sales of profitable crops and find ways to cut costs on less profitable ones. You can even decide to drop unprofitable crops and consider new, more profitable ones.

To answer these questions, we need a little more information:

1. What is the selling price of each crop?
2. How many square-feet of space does each crop take on the bench?
3. How many pots or flats of each crop do you produce?
4. What percentage of each crop is sold?
5. What are the production costs for each crop?

Even if you don't know the answer to question number five, you can still get a rough idea of production costs for each crop by knowing the first four items. You can then calculate costs for each crop based on a square feet per week allocation of all costs to each crop. Throughout the article are examples of possible calculations using the five values above; these are probably the most important part of the article because they show you how to actually work with your numbers to determine more valuable and less valuable crops. Below is some discussion of the calculations, tables, how I arrive at the numbers and what they mean. ➧



Do you know whether geraniums, marigolds or poinsettias are profitable for you? Once you know which is most profitable, you can find ways to increase sales and ways to cut costs.

Figure 1. An example from the Greenhouse Cost Accounting program of output information per units and per crop.

	Petunia flats	Marigold flats	Geranium flats	Geraniums (4-inch pots)	Poinsettias (6-inch pots)	Total
Cost per unit						
Total direct costs	**$2.27**	**$2.27**	**$3.60**	**$0.48**	**$0.92**	**—**
Overhead costs	**3.50**	**2.63**	**5.69**	**0.18**	**4.01**	**—**
Loss of unsold plants	**0.12**	**0.10**	**0.19**	**0.03**	**0.26**	**—**
Total costs	**5.89**	**4.99**	**9.49**	**0.70**	**5.18**	**—**
Sales price	**6.50**	**6.50**	**10.00**	**1.20**	**5.00**	**—**
Profit (loss)	**0.61**	**1.51**	**0.52**	**0.50**	**(0.18)**	**—**
Cost per crop						
Direct costs	**$11,335.50**	**$6,793.50**	**$18,015.00**	**$4,847.00**	**$13,770.00**	**$54,760**
Square foot	**8,200**	**4,920**	**8,200**	**1,100**	**15,000**	**37,420**
Square ft.-wk.	**65,600**	**29,520**	**106,600**	**6,600**	**225,000**	**433,320**
Overhead per sq.ft.-wk.	**$0.27**	**$0.27**	**$0.27**	**$0.27**	**$0.27**	**$0.27**
Sales	**$31,850.00**	**$19,110.00**	**$49,000.00**	**$11,400.00**	**$71,250.00**	**$182,610**
Totals cost	$28,851.66	$14,680.27	$46,480.51	$ 6,609.50	$73,855.16	$170,477
Profit (loss) per crop	2,998.34	4,429.73	2,519.49	4,790.50	(2,605.16)	12,133
Profit (loss) per unit	0.61	1.51	0.51	0.50	(0.18)	—
Profit (loss) per sq.ft.-wk.	0.05	0.15	0.02	0.73	(0.01)	—

PROFITABLE CROPS

In the April 2003 issue of *GPN*, I discussed a simple Greenhouse Cost Accounting program developed in Microsoft Excel and distributed by Rutgers University that lets you determine the costs and returns of each crop you produce. We looked at a hypothetical 20,000 sq.ft. greenhouse with a simple production schedule of only five crops: petunia flats, marigold flats, geraniums flats, geraniums in 4-inch pots and poinsettias in 6-inch pots (See Figure 1, above). We found that the most profitable crop was not always the most profitable crop per

Figure 2. An example of input section 2, which includes information on specific crops, from the Greenhouse Cost Accounting program.

	Petunia flats	Marigold flats	Geranium flats	Geraniums (4-inch pots)	Poinsettias (6-inch pots)	Total
Labor	**$3,385.00**	**$2,031.00**	**$3,385.00**	**$1,240.00**	**$2,070.00**	**$12,111.00**
Seeds or plants	**1,320.00**	**792.00**	**7,920.00**	**660.00**	**8,400.00**	**19,092.00**
Containers	**2,900.00**	**1,740.00**	**2,900.00**	**600.00**	**1,350.00**	**9,490.00**
Growing medium	**2,750.00**	**1,650.00**	**2,750.00**	**500.00**	**1,500.00**	**9,150.00**
Fertilizer and chemicals	**155.00**	**90.00**	**235.00**	**200.00**	**450.00**	**1,130.00**
Tags	**823.50**	**494.10**	**823.50**	**1,647.00**	**0.00**	**3,788.10**
Other direct costs	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Number of units started	**5,000**	**3,000**	**5,000**	**10,000**	**15,000**	**38,000**
Square feet per unit	**1.64**	**1.64**	**1.64**	**0.11**	**1.00**	**—**
Weeks to grow	**8**	**6**	**13**	**6**	**15**	**—**
Percent sold	**0.98**	**0.98**	**0.98**	**0.95**	**0.95**	**—**
Sales price	**$6.50**	**$6.50**	**$10.00**	**$1.20**	**$5.00**	**—**

square foot. In this example, marigold flats are the most profitable crop per pot (per unit), but geraniums in 4-inch pots are the most profitable per square-foot, an important distinction to evaluate in your over-all profit analysis.

Geraniums in 4-inch pots are sold at the lowest price per unit of any of the crops in the example, but they take up far less space than a flat, and are the most efficient user of space. Geranium flats get the highest price per unit of any of the crops in the example but take twice as long to produce as marigold flats, so they make only one third of the profit that marigold flats do. Poinsettias in 6-inch pots made the least amount of profit. Each pot lost $0.18, and the net loss on the poinsettia crop was $2,605. Of course, all of these figures will change for each individual business, but look how much data you can get from taking information from your tax form Schedule F (or Schedule C if you are a corporation) and some simple cost per crop information.

To review what we did to get these figures: We entered all of the costs for a year for the entire greenhouse; then we entered the total square-feet area, the percentage of that area used for production and the weeks in production (See Figure 3, page 84).

Figure 3. An example of the first input screen, which includes income statement and space usage information, from the Greenhouse Cost Accounting program.

Values from Income Statement (Schedule F or C)		
	Original	Without Poinsettias
Sales	$182,610	$108,755
Directs costs		
Seeds, cuttings, or plants	19,092	10,692
Pots or containers	9,490	8,140
Growing medium	9,150	7,650
Fertilizer and chemicals	1,130	680
Tags	3,788	3,788
Other	0	0
Overhead salaries (including benefits)	37,384	37,384
General wages (including benefits)	12,111	10,041
Utilities		
Heating fuel	20,000	20,000
Electricity	3,350	3,350
Telephone	1,480	1,480
Water	0	0
Overhead		
Depreciation	16,750	16,750
Interest	16,800	16,800
Repairs	3,725	3,725
Taxes	550	550
Insurance	3,240	3,240
Advertising	485	485
Dues and subscriptions	100	0
Travel and entertainment	345	345
Office expense	314	314
Professional fees	550	550
Truck expense and equipment rental	7,150	7,150
Land rental	2,000	2,000
Contributions	18	18
Bad debts	925	925
Miscellaneous	550	550
Greenhouse area (sq.ft.)	20,000	20,000
Greenhouse space used for production	75%	75%
Weeks in operation (52 if a full year)	29	14

PRODUCTION COSTS

We had some estimates of production costs for the costs in our example; they are entered in Figure 2, page 83. A look at the results showed geraniums in 4-inch pots making the most profit, and poinsettias making the least profit, actually losing $0.18 per pot or $0.01 per square-foot. But, before making any rash decisions about crops, you have to ask yourself if it is a smart move to drop an unprofitable crop? Let's see what happens when we drop poinsettias.

Without poinsettias, income drops by $73,855 (See Figure 3, above). We drop the variable costs listed in Figure 2, page 83 from the crop section and the income statement. We reduce the weeks in production ➧

Figure 4. An example from the Greenhouse Cost Accounting program of output information per units and per crop with no poinsettias.

	Petunia flats	Marigold flats	Geranium flats	Geraniums (4-inch pots)	Poinsettias (6-inch pots)	Total
Cost per unit						
Total direct costs	**$2.27**	**$2.27**	**$3.60**	**$0.48**	**$0.00**	**—-**
Overhead costs	**7.29**	**5.47**	**11.84**	**0.37**	**0.00**	**—-**
Loss of unsold plants	**0.19**	**0.16**	**0.32**	**0.04**	**0.00**	**—-**
Total costs	**9.55**	**7.73**	**15.45**	**0.85**	**0.00**	**—-**
Sales price	**6.50**	**6.50**	**10.00**	**1.20**	**5.00**	**—-**
Profit (loss)	**(3.25)**	**(1.39)**	**(5.76)**	**0.30**	**0.00**	**—-**
Costs per crop						
Direct costs	**$11,335.50**	**$6,793.50**	**$18,015.00**	**$4,847.00**	**$0.00**	**$40,990**
Square foot	**8,200**	**4,920**	**8,200**	**1,100**	**0**	**22,420**
Square ft.-wk.	**65,600**	**29,520**	**106,600**	**6,600**	**0**	**208,320**
Overhead per sq.ft.-wk.	**$0.56**	**$0.56**	**$0.56**	**$0.56**	**$0.00**	**$0.56**
Sales	**$31,850.00**	**$19,110.00**	**$49,000.00**	**$11,400.00**	**$0.00**	**$111,360**
Totals costs	$47,772.64	$23,194.61	$77,226.61	$ 8,513.13	$0.00	$156,707
Profit (loss) per crop	(15,922.64)	(4,084.61)	(28,226.61)	2,886.87	0.00	(45,347)
Profit (loss) per unit	(3.25)	(1.39)	(5.76)	0.30	0.00	—
Profit (loss) per sq.ft.-wk.	(0.24)	(0.14)	(0.26)	0.44	0.00	—

from 29 to 15 weeks. We have just eliminated the only unprofitable crop, so we should be making more money, right? Think again. Poinsettias may have been losing money, but each pot was carrying $4.01 of overhead costs. In addition, they were carrying all but $0.18 of the variable costs during the time they were on the bench.

When they are no longer in the picture, the other crops must carry the overhead costs, and then, every crop becomes unprofitable except for geraniums in 4-inch pots. The entire business is losing more than $45,000 instead of making money as it did when we grew poinsettias. Instead of simply dropping a crop that is not profitable, you might look at other, more sound options, such as possibly raising the price of poinsettias (A $0.20 price increase would make them a slightly profitable crop instead of one that loses money.) or substituting part or all of the poinsettia crop for a new, more profitable crop such as cyclamen, gerberas or another of the up-and-coming poinsettia alternatives. You might also consider growing your poinsettias in a more profitable size (3-inch or 8-inch) or growing novelty varieties that can fetch a higher price.

Looking for more sales of geraniums in 4-inch pots should also be considered, in which case, you would leave the greenhouse empty during normal poinsettia production. A closer look at the overhead and variable costs to find ways to be more efficient should also be done. This example shows that knowledge of profitability of each crop helps managers make production and marketing decisions to improve their businesses. It lets you do some "what if" planning on paper instead of making bigger mistakes in the greenhouse.

You can find an interactive greenhouse crop budget at http://aesop.rutgers.edu/~farmmgmt/greenhouse/greenhouseinteractiveform.htlm. GPN

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