Growing “quality” plants is now the easy part of managing a greenhouse business – a necessary but insufficient requirement for financial success. The greater challenge is to be profitable in a competitive industry with low margins. In this environment, it is increasingly important to analyze costs and profitability.

This article series will report results from leading universities and growers in the Floriculture Research Alliance (floriculturealliance.org) who are working together to calculate costs of plugs, cuttings, liners, and finished plant production.

Our goal is to provide tools that help you calculate where you are making or losing money, and what changes can make your business more profitable. This first article discusses the low hanging fruit, so to speak. There is a wealth of information that can be easily gleaned from your annual income statement to improve your business profitability. Future articles will detail how to accurately track overhead costs, space, and enterprise budgets.

Benchmarking: Are You Keeping Up with the Joneses?
Companies can compare their performance against competitors, known as external or cross-sectional benchmarking, as well as compare their own company companies so successful when folks have less money to spend? Not to mention the fact that I think they both have pretty bad pizza. People are buying more pizza than ever and having fun doing it. Social media has built Dominoes and Pizza Hut quite a community.

To all the industry folks out there saying people have no money for plants – it’s not true. They have money to stand in a long line for a meal at the Cheesecake Factory on weekends and the food isn’t cheap, but there’s always a line, isn’t there? They are buying. There are fewer people buying and their buying habits have changed, but they are buying.

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Are We Prepared for a Cultural Shift?

I’d like to talk about three very important things that are currently affecting our industry.

1. Social media is here to stay...
   Perhaps it is a dirty word to some of you, but it is something you should start paying attention to – pronto!
   Can you guess one of the biggest industries embracing social media? It’s pizza. That’s right, take-out pizza. Dominoes and Pizza Hut have the two hippest, most happening, truly beloved social media campaigns right now.
   Are you going to tell me people NEED pizza? They need pizza way less than they NEED plants. So, why are these
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OFA News

This is a member benefit of OFA – The Association of Horticulture Professionals.
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Mine Your Income Statement

performance from year to year (internal or time series benchmarking). This goes beyond knowing “did I make money at the end of the year?” and delves into specific costs such as labor as a percent of sales, and returns per square foot of production area, for similar types and sizes of businesses. However, benchmarking and cost analysis are still not common practices in the greenhouse industry. Based on responses at the OFA Short Course or other grower workshops, fewer than 10 percent of growers have calculated key parameters such as overhead cost per square foot-week.

The example data presented here represent the average of eight leading young plant growers from a survey of calendar year 2006 data by the Young Plant Research Center. To convert 2006 dollars to 2012 dollars using the consumer price index, multiply figures reported here by 1.129. As far as we know, these are the only available benchmarking figures for wholesale plug and liner growers.

We are currently updating the survey. If your operation fits the requirements of our population (at least $1M in annual wholesale sales of plugs, cuttings, or tissue culture liners), contact Paul Fisher at pfisher@ufl.edu for an Excel spreadsheet to participate in this year’s analysis. The more similar businesses are to your own operation, the more valid and useful the benchmarking comparison. All greenhouse and nursery growers can also use an online benchmarking tool managed by the University of Florida at https://hortbusiness.ifas.ufl.edu/analysis/, which includes a broad cross-section of businesses.

The Income Statement

The obvious place to start analyzing costs and revenues is your annual income statement, because every business tracks income and costs for tax reporting. The most accurate way to compare annual data is on an accrual basis, which takes into account changes in inventory (such as value of stockpiled pots and media), rather than just cash revenue and costs that are received or paid during the year. However, both accrual and cash accounting provide useful data.

A first step in analyzing the income statement (Table 1) is to divide the information into broad sections that include:

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germplasm collection. We are concentrating our efforts in capturing a genetically diverse assemblage of the economically important species. The current collection represents some of the major species and selected hybrids; the collection is maintained as clones, but increasing effort has been going into maintaining the species as seeds. However, there is much that is not known (or at least not published) about the seed biology of begonias. Of principal concern for a germplasm center is seed longevity. How long can we keep begonia seeds alive? That question has not been satisfactorily answered and the OPGC is exploring ways to effectively store begonia seeds with high viability for long periods (> 25 years). Another dimension of our germplasm work is to explore and define the relationships between species by determining which species cross readily and which do not. For example, the yellow-flower trait present in some begonias is conspicuously absent in the wax begonias (B. Semperflorens-Cultorum Group). Is there an effective mechanism to bring this trait over? We are also pursuing molecular analysis of the collection using DNA markers in order to generate additional identifiers of species and hybrids. A major challenge with begonia production is bacterial leaf spot, caused by Xanthomonas campestris pv. begoniae. How much variability is there among our germplasm for susceptibility? Can we identify genetic sources of resistance to this disease?

The OPGC strives to generate information and develop materials that can further promote the use of popular begonias for many years to come. The OPGC is supported by funds from the USDA Floriculture and Nursery Research Initiative and by The Ohio State University. We encourage individuals and organizations that work with begonias and have an interest in sharing materials and information to contact us. We share all of our begonia materials and experiences with the industry and seek further collaboration. While 2012 may be a year when we give special focus to the highly-deserving begonias, every year is a good year indeed to grow these remarkable plants!

For more information

References with information on Begonia include:


American Begonia Society (www. begonias.org)

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Ornamental Plant Germplasm Center
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jourdan.1@osu.edu
http://opgc.osu.edu
Mine Your Income Statement

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- Gross revenue (sales and other income)
- Direct input costs (pot, cutting, label, sleeve, etc.) that increase with every additional unit produced
- Labor costs (in this case, we have combined production, shipping, sales, and management)
- Overhead costs such as marketing, insurance, and utilities that are difficult to assign on a per unit basis
- Net income

Direct costs, labor costs, and overhead costs each contributed similar amounts to total costs (Table 1). You could compare this break down with your operation – for example, are you heavy on overhead or labor? Each of these categories can be further subdivided for detailed analysis (Tables 2 to 5). By adding additional information on space and labor use, factors such as overhead cost per square foot-week or sales per full time equivalent (FTE) worker can be calculated. The biggest effort occurs in the first year to organize financial information into categories that make sense for grower decision making, as opposed to tax reporting. Once you have developed this first report, future years of data will be easier to prepare to allow comparisons.

Data in Table 1 are presented with several units:
- Total dollars ($) Contribution to total business income on an absolute basis.
- Percent of sales (%): Contribution to total business income as a proportion of total revenue.
- Dollars per square foot ($/ft²): Annual income or cost per square foot (covered space only).
- Dollars per square foot-week of combined covered and field space ($/sfw).

Operations in the survey averaged 17.5 acres (range from 4 to 35 acres) of production area, with an average of 12.3 acres (75 percent) as covered area (rather than field production space). Space calculations excluded aisles, shipping area, and other space not used for production. All crops were grown in protected areas only, except potted finished plants which were grown both inside and outdoors.

To convert square foot calculations in Table 1, multiply by 43,560 for an acre basis, or by 10.76 to square meters of production area. For example, the average return per covered acre of productive area was $24.37 x 43,560 = $1,061,625 per acre.

Multiply the per acre figure by the space use efficiency (crop production area/total area) to get the values per total acres utilized – the total footprint of an operation. For example, if only 85 percent of the total area is used for crop production, with 15 percent as aisles and other non-productive areas, then the return per total area would be 85 percent x $1,061,625 = $902,381 per acre (total).

In greenhouse production, space (ft²) and time (weeks) are both limiting resources during the peak production season. Square foot-weeks (sfw) can be used to compare revenue or costs for crops such as wholesale potted crops which tend to use a lot of space per unit for an extended period. For example, say a crop has 18 inches x 18 inches spacing for 16 weeks, then the sfw = 1.5 ft x 1.5 ft x 16 weeks equals 36 sfw. Compare this to a crop in plug trays that use a small area, say approximately 1.5 ft² per 1020 tray, and for a short time (i.e. 5 weeks), so then 1.5 ft x 5 weeks equals 7.5 sfw.

The simple calculation for sfw used here is based on square feet for different types of indoor and outdoor production area, times the number of weeks that each type of space is in use. For example, if you have 40,000 square feet of covered production and use this space for 20 weeks, then 40,000 ft² x 20 weeks equals 800,000 sfw. In the survey group, an average of 28,862,209 sfw were available for production, with 84 percent of this as covered space.

The advantage of calculating overhead cost per sfw is the ability to allocate overhead and labor to an individual crop in an enterprise budget. For example, if the direct costs for the cutting, pot, and media in a 4.5-inch specialty annual crop equals $0.75, and the plant is spaced at 6 inches x 6 inches (0.25 ft²) for 5 weeks, the crop would use 1.25 sfw. If the overhead and labor cost per sfw equals ($0.13+$0.13=$0.26), then 1.25 x $0.26 equals $0.33 per plant, giving a total cost of $0.75+$0.33 = $1.08.

We will devote an article later in the series to accurately tracking space use and its effects on profitability. The simple calculations reported here help us to get started down that path. However, a key factor we are not taking into account is that true calculation of space utilization must include the percent of available greenhouse space filled each week with crop plants. For example, if a greenhouse is used only 50 percent of the year, or is only 50 percent full all of the year, then the overhead costs per sfw are doubled.

Table 1. Summary of the income statement data from eight leading U.S. young plant growers in 2006.

<table>
<thead>
<tr>
<th></th>
<th>$</th>
<th>% of sales</th>
<th>$/ft²</th>
<th>$/sfw</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Revenue (TR)</td>
<td>$10,292,795</td>
<td>100.0%</td>
<td>$24.37</td>
<td>$0.42</td>
</tr>
<tr>
<td>Direct Costs (DC)</td>
<td>$3,339,313</td>
<td>30.1%</td>
<td>$8.10</td>
<td>$0.14</td>
</tr>
<tr>
<td>Labor Costs (LC)</td>
<td>$3,099,638</td>
<td>31.9%</td>
<td>$7.65</td>
<td>$0.13</td>
</tr>
<tr>
<td>Overhead Costs (OC)</td>
<td>$3,282,926</td>
<td>30.8%</td>
<td>$7.69</td>
<td>$0.13</td>
</tr>
<tr>
<td>Total Costs (TC = DC+LC+OC)</td>
<td>$9,721,877</td>
<td>92.9%</td>
<td>$23.44</td>
<td>$0.40</td>
</tr>
<tr>
<td>Gross Margin (TR-DC)</td>
<td>$6,953,481</td>
<td>69.9%</td>
<td>$16.27</td>
<td>$0.28</td>
</tr>
<tr>
<td>Net Income (TR - TC)</td>
<td>$570,918</td>
<td>7.1%</td>
<td>$0.93</td>
<td>$0.02</td>
</tr>
</tbody>
</table>
knowledge, a quick way to become more profitable is to reduce the time that greenhouse space lies empty.

**Revenue**

The breakdown of revenue sources (Table 2) characterizes our survey grower population, i.e. fairly large operations with an average 58.5 percent of income from young plant sales, and minor if any retail income. For your own operation, it may be useful to divide product categories in a different way, for example with detailed analysis of specific crops such as poinsettias, fall mums, geraniums, etc. By comparing income statements over a period of years, you can track increasing, stable, or falling revenue in absolute and percentage terms to project market trends of different crops.

Note that total revenue per square foot ($/ft$^2$) differs slightly in Table 2 from Table 1. In Table 2, potted crops were calculated per ft$^2$ of combined covered and field space, whereas other crops were calculated per ft$^2$ of covered space only. All other figures reported per ft$^2$ in the article only include covered area.

Total revenues per ft$^2$ of production area among surveyed firms averaged $24.37 and ranged from $9.47 to $38.69. This four-fold difference between these growers depended on the type of crops (annual, perennial, or foliage tissue culture, plugs and liners) and crop production times (from four weeks to nearly one year). The observed variability within “young plant growers” highlights how diverse our industry is, and the challenges of benchmarking across firms.

**Direct Costs**

Not surprisingly for young plant growers producing large volumes of small plugs and liners, seeds, plants, trays, and media contributed the majority of direct costs (Table 3). Note also which factors had little impact on total costs. For example, fertilizers, pesticides, and plant growth regulators together cost less than $0.006 per sfw. To put this into perspective, for a 1020 tray of liners with a six-week crop time, cost per tray (7.5 sfw) would only add $0.045 per tray. Greater potential cost savings come from improved efficiencies with large cost items. For example, trying to lower cost by reducing pesticide or fertilizer applications would have almost no impact on profitability, whereas losing even one cutting to disease could easily cost $0.20 or more in direct costs and labor to fix the tray, and an even greater opportunity cost (the sales price of that cutting). Of course it is important to negotiate a lower cost and to reduce waste for all purchased inputs, but the income statement provides a clear focus on the relative importance of different costs.

**Labor**

Labor calculations from the income statement (Table 4) provide a first estimate for allocating labor in enterprise budgets. Office staff (managerial/secretarial/sales) is normally allocated as an overhead cost per sfw. Production labor increases directly in relation to the number of units. Therefore,
production labor can either be simply considered on a cost per sfw basis, or as a direct cost per unit produced if the time required for tasks such as planting, moving plants to the greenhouse, pinching, irrigation, grading, etc. are quantified and multiplied by wage and benefit costs. The balance between production and management labor costs of 2:1 could be an interesting comparison with your company – the range was 4.2:1 to 0.7:1 in the survey group, which may have partly depended on the focus on either growing or marketing and also the category in which grower managers were entered.

**Overhead Costs**

The detailed analysis of overhead costs in Table 5 is summarized into broad categories in Figure 1. The facility costs (including depreciation) contributed more than 50

### Table 4. Labor Costs.

<table>
<thead>
<tr>
<th>Labor Category (Wages + Benefits)</th>
<th>$</th>
<th>% of sales</th>
<th>$/ft²</th>
<th>$/sfw</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production, maintenance, and shipping</td>
<td>$2,082,468</td>
<td>21.6%</td>
<td>$3.88</td>
<td>$0.093</td>
</tr>
<tr>
<td>Managerial/secretarial/sales labor and benefits</td>
<td>$1,017,170</td>
<td>10.3%</td>
<td>$1.62</td>
<td>$0.039</td>
</tr>
<tr>
<td>Total Labor Cost (LC)</td>
<td>$3,099,638</td>
<td>31.9%</td>
<td>$5.51</td>
<td>$0.133</td>
</tr>
</tbody>
</table>

### Table 5. Overhead Costs.

<table>
<thead>
<tr>
<th>Overhead Cost Category</th>
<th>$</th>
<th>% of sales</th>
<th>$/ft²</th>
<th>$/sfw</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office and staff</td>
<td>$276,162</td>
<td>2.6%</td>
<td>$0.68</td>
<td>$0.011</td>
</tr>
<tr>
<td>Professional fees, consultants, and contracted services</td>
<td>$96,671</td>
<td>0.9%</td>
<td>$0.27</td>
<td>$0.004</td>
</tr>
<tr>
<td>Office supplies, computer systems, postage</td>
<td>$54,217</td>
<td>0.7%</td>
<td>$0.13</td>
<td>$0.002</td>
</tr>
<tr>
<td>Education, training, dues, subscriptions, contributions</td>
<td>$23,236</td>
<td>0.3%</td>
<td>$0.05</td>
<td>$0.001</td>
</tr>
<tr>
<td>Employee welfare</td>
<td>$55,968</td>
<td>0.4%</td>
<td>$0.11</td>
<td>$0.002</td>
</tr>
<tr>
<td>Travel and entertainment</td>
<td>$46,070</td>
<td>0.4%</td>
<td>$0.12</td>
<td>$0.002</td>
</tr>
<tr>
<td>Utilities</td>
<td>$703,820</td>
<td>7.4%</td>
<td>$1.68</td>
<td>$0.029</td>
</tr>
<tr>
<td>Electricity</td>
<td>$129,245</td>
<td>1.3%</td>
<td>$0.31</td>
<td>$0.005</td>
</tr>
<tr>
<td>Heating Fuel</td>
<td>$456,754</td>
<td>4.1%</td>
<td>$1.06</td>
<td>$0.018</td>
</tr>
<tr>
<td>Gas/Diesel</td>
<td>$46,194</td>
<td>1.4%</td>
<td>$0.16</td>
<td>$0.003</td>
</tr>
<tr>
<td>Telephone</td>
<td>$41,836</td>
<td>0.4%</td>
<td>$0.10</td>
<td>$0.002</td>
</tr>
<tr>
<td>Water/Sewage/Garbage removal</td>
<td>$29,792</td>
<td>0.3%</td>
<td>$0.06</td>
<td>$0.001</td>
</tr>
<tr>
<td>Facilities</td>
<td>$1,682,720</td>
<td>16.3%</td>
<td>$4.12</td>
<td>$0.070</td>
</tr>
<tr>
<td>Depreciation</td>
<td>$454,292</td>
<td>5.2%</td>
<td>$1.17</td>
<td>$0.020</td>
</tr>
<tr>
<td>Interest</td>
<td>$252,476</td>
<td>2.3%</td>
<td>$0.56</td>
<td>$0.010</td>
</tr>
<tr>
<td>Insurance</td>
<td>$208,051</td>
<td>1.8%</td>
<td>$0.42</td>
<td>$0.007</td>
</tr>
<tr>
<td>Land rental</td>
<td>$270,466</td>
<td>2.5%</td>
<td>$0.86</td>
<td>$0.014</td>
</tr>
<tr>
<td>Property taxes</td>
<td>$61,533</td>
<td>0.5%</td>
<td>$0.14</td>
<td>$0.002</td>
</tr>
<tr>
<td>Greenhouse tools and other misc. supplies</td>
<td>$37,994</td>
<td>0.4%</td>
<td>$0.12</td>
<td>$0.002</td>
</tr>
<tr>
<td>Property maintenance, landscaping</td>
<td>$33,323</td>
<td>0.3%</td>
<td>$0.06</td>
<td>$0.001</td>
</tr>
<tr>
<td>Repairs and maintenance, excluding labor</td>
<td>$237,308</td>
<td>2.0%</td>
<td>$0.48</td>
<td>$0.008</td>
</tr>
<tr>
<td>Lease/rental of equipment, racks, vehicles</td>
<td>$127,277</td>
<td>1.3%</td>
<td>$0.31</td>
<td>$0.005</td>
</tr>
<tr>
<td>Account management</td>
<td>$170,605</td>
<td>1.6%</td>
<td>$0.37</td>
<td>$0.007</td>
</tr>
<tr>
<td>Bad debts</td>
<td>$9,931</td>
<td>0.1%</td>
<td>$0.01</td>
<td>$0.000</td>
</tr>
<tr>
<td>Bank charges</td>
<td>$42,782</td>
<td>0.3%</td>
<td>$0.08</td>
<td>$0.002</td>
</tr>
<tr>
<td>Advertising</td>
<td>$117,892</td>
<td>1.2%</td>
<td>$0.28</td>
<td>$0.005</td>
</tr>
<tr>
<td>Trucking/shipping (freight) excluding labor</td>
<td>$412,836</td>
<td>3.2%</td>
<td>$0.74</td>
<td>$0.013</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>$36,783</td>
<td>0.5%</td>
<td>$0.10</td>
<td>$0.002</td>
</tr>
<tr>
<td>Total overhead costs</td>
<td>$3,282,926</td>
<td>30.8%</td>
<td>$7.69</td>
<td>$0.132</td>
</tr>
</tbody>
</table>
percent of the overhead, which is not surprising given the capital intensive nature of greenhouse production. The combined utilities and depreciation costs contributed around 35 percent of total overhead. When comparing greenhouse and field space, field space that is unheated and has minimal depreciation might cost around 65 percent of the overhead cost of greenhouse space. Shipping costs varied considerably between growers depending on whether these costs were passed on as a line item charged to customers (such as FedEx, in which case shipping cost was not included here), or were borne by the company.

In Conclusion

Your income statement is much more valuable than just an accounting or tax document – it can help identify opportunities to increase efficiency, to benchmark in comparison to other growers or between years, and is a first step to calculate costs per sfw to use in enterprise budgets. Hopefully, as you have read this article you thought to yourself “yes, but…”, critiquing the simple analysis presented here. The devil really is in the details with greenhouse cost accounting, and the next article will discuss why we recommend a more detailed analysis.

Figure 1

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