Southern Cooperative Series Bulletin

May 2002 SCSB #401

Enhancing Profitability in Greenhouse Firms

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Enhancing Profitability in Greenhouse Firms

Abstract

This publication was authored by horticulturists and agricultural economists participating in the S290 multi-state regional project entitled “Technical and Economical Efficiencies of Producing, Marketing, and Managing Environmental Plants” (see http://www.hcs.ohio-state.edu/s290 for more information about S290). The purpose of this research project was to develop a compendium of the most up-to-date guidelines that will assist greenhouse managers in making more informed decisions regarding their production and marketing-related business practices. A section discussing major driving forces affecting the greenhouse industry is presented first, followed by sections specifically addressing marketing, personnel management, portfolio (product mix) management, materials handling and distribution, equipment procurement, cost accounting, pricing, and financial management. Greenhouse managers should carefully consider the factors surrounding each of these topical areas in their attempt to develop a long-run sustainable competitive advantage in today’s dynamic marketplace.

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Issues Affecting Profitability of the Nursery and Greenhouse Industry

Charles Hall - University of Tennessee

One of the key premises in strategic management is the identification of the principal driving forces (or trends) that affect the industry in which you are competing. “Driving forces” are forces that are in motion that create incentives or pressures for change. The most dominant driving forces are those that will have an impact on the kinds of changes that will take place in the industry’s structure and competitive environment. Managers will not really understand industry and competitive conditions until they understand the fundamental drivers of change.

For the past few years, data have been collected and analyzed regarding the most dominant driving forces that will affect the greenhouse/nursery industry at all levels of competition. In fact, the focus of several workshops was identification of these driving forces. In these sessions, various growers, landscapers, and retailers worked hard in brainstorming and summarizing what they felt were the key driving forces that we will have to deal with in the latter part of the 1990's and the new millennium.

As a preface to these findings, there are some interesting points discussed in these meetings regarding driving forces of change. Discussions centered around the point that no one knows exactly what's going to happen in the future. Forecasts and predictions, even those made by "experts," are oftentimes unreliable, as they tend to be based on extrapolation and projection. This exposes them to those two killer caveats, "if present trends continue" (they never do), and "all other things being equal" (they never are).

As for the uncertain future, that includes everything else! It sounds daunting, but one can begin to identify and categorize the driving forces or trends that are relevant to their own business. For a nursery professional in today’s competitive environment, these trends might include:

- *Social, lifestyle, and consumer trends*. Are middle-aging consumers trading down and buying less as they re-evaluate their priorities? If so, is this temporary or permanent? If not, is there a switch to more goods that are shopped for and purchased in a more price-conscious manner?

- *Business and management trends*. Will slow, uneven growth continue through the 1990's? Who will be the winners and losers, and what will determine success or failure in an uncertain era?

- *Political, legislative, and regulatory trends*. What laws will be passed on the federal, state or local level that will affect my business, customers, employees, suppliers?

- *Workforce and workplace trends*. Can I find and retain employees with the skills and motivation needed at salaries I can afford? How do I supervise them while giving the right level of autonomy and responsibility?

- *Marketing, advertising, and media trends*. How do I reach today's more segmented, fragmented marketplace? What message do I want to convey? Should I compete on price, service, selection of merchandise, quality, convenience or a combination thereof?

Can these questions really be answered in a definitive and absolute way? Not really, but definitive answers are not the point. More important is the process of considering the future and the acknowledgment that it will be different from the past and present. Conducted thoughtfully and imaginatively, this process can itself become a strategic tool that enables its practitioners to be prepared for whatever the future may bring. And that is indeed the point.

When brainstorming regarding these driving forces, participants came up with several dozen possible ideas. By combining related ideas and reducing duplication, they can be expressed as five major driving force categories that appear as follows:

- **Increasing environmental concerns**
- **Increasing regulatory concerns**
- **Improving communications technology**
- **Customers are becoming more sophisticated**
- **Increasing emphasis on partnership marketing**

However, identifying the driving forces is only the first step. Their potential impact on the greenhouse and nursery industry must be assessed and possible solutions or actions that deal with these driving force impacts must be postulated. These impacts and proposed solutions are summarized below:

Driving Force # 1 - Increasing environmental concerns

Impact on Industry

- Increasing demand for environmentally friendly plants.
- Increased use of native plants and organic gardening.
- Which chemicals are available for use as well as how they are used.
- Suppliers and manufacturers will either adapt or fall off approved vendor list.
- More research on chemical use, plant varieties, genetically modified plant materials, etc. (i.e., aesthetic vs. economic thresholds)
- Increased recycling efforts of plastic films, trays, and containers. (increased composting as well.)
- Water conservation efforts will affect plant selection, nursery size, etc.
- Increased pressure on municipal landfills due to increasing volume of yard waste deposits.
- The industry must stay on top of key legislative issues as they arise.
- Water quality concerns will change how water is used and how runoff is collected and managed.
- Encourage chemical manufacturers to take more responsibility in the disposal of toxic materials.

Proposed Solutions

- Set up environmental hot line at the retail level.
- Public relations will help to educate public on environmental stewardship.
- Merchandising at retail level must have environmental flavor
- Offer unbiased recommendations at retail level.
- Staff at all levels must be trained or even certified (may need an expert on staff).
- Increased product mix to include native, xeriscaping products, and environmentally friendly products.
- Recycle water at all levels (grower & retail)
- Set an example in your display landscapes.
- Offer seminars in environmental friendliness.
- Encourage promotional programs such as “Don’t-Bag-It” to reduce yard waste in land fills.
- Promote composting by providing information at the retail level.
- Emphasize recycling of used containers.
- Establish a Christmas tree recycling program.

Driving Force # 2 - Increasing regulatory concerns

Impact on Industry

- Increasing irrigation legislation at city, county, and state levels.
- Increased pressures on minor use chemicals (will increase cost of registration passed on).
- Worker-related legislation will increase and inherently increase labor costs in short run.
- Research regarding pest control will increase (i.e., chemical alternatives).
- Chemical disposal methods at grower, retail, and consumer level will be reviewed and monitored.
- International competitiveness will be affected.
- More paperwork will be required.
- Plant production processes may change as well as the composition of the work force.
- Insurance rates will increase as extent of liability increases.

Proposed Solutions

- Stay positive at the association level.
- Acquire information faster.
- Training, training, and more training!
- Be proactive, not reactive.
- Letter writing to government officials.
- Outside companies may be hired for spraying (outsourcing).
- Support research projects at land-grant universities.
- Develop educational programs on OSHA regulations.
- Develop educational programs on environmental regulations.

Driving Force # 3 - Improving communications technology

Impact on Industry

- Internet will increase availability of production and marketing information (at home, in the store, for the grower, etc.).
- Will be able to use scanner data to measure customer buying preferences (efficient consumer response - ECR) especially with supermarket loyalty programs
- Encourage partnerships between suppliers and vendors using electronic data interchange (EDI).
- Make plant labeling easier (providing information regarding culture, price, etc.)
- Speed of communications will increase.

Proposed Solutions

- Develop a long-range plan on how to manage communications.
- Computer literacy training (in-home and outside) to stay up on latest technology.
- Update existing computer systems (CAD, POS, etc.)
- Learn how to “surf” the Internet.
- Implement POS systems to track customer sales.
- Design landscapes by FAX or e-mail.
- Utilize CD-ROM information systems to provide advice regarding insect control, plant selection, etc.

Driving Force # 4 - Customers are becoming more sophisticated

Impact on Industry

- Customers are demanding service at all levels of the value chain.
- Customers demand knowledge and information.
- Demographic shifts may dictate alternate marketing strategies (regarding retirees, elderly).
- Apartment dwellers need more shade loving, blooming, annuals/perennials.

- Opportunities exist to expand customer base (i.e. children).
- Customers are becoming more aware of their choices (of stores, plant material, information sources, etc.)
- Customers want to spend less time shopping (in general).
- Advertising will need to be more creative and stimulating.
- Self-service shopping will influence purchasing methods.
- Continued emphasis on “microwave” gardening - instant landscape.
- Customers interested in alternative landscapes (water gardening, xeriscape, organic, etc.).
- There will be more of a need for niche marketing.
- Need to discern macro and micro trends affecting local trade areas.

Proposed Solutions

- Offer concessions and related services at the garden center.
- Employees must be well trained and knowledgeable.
- Implement stronger customer service programs.
- Pay attention to image and reputation.
- Growers/seed dealers need to constantly update/improve plant varieties.
- Offer value-added products.
- Ensure a pleasant shopping experience (atmosphere, layout, etc.).
- Offer seminars on pertinent topics.
- Implement mail order (home shopping) and home delivery services (be convenient).
- Cooperative advertising between growers and retailers.
- Offer computerized in-store information systems (insect/disease ID, pictures of plants in bloom, etc.).
- Hire knowledgeable employees (i.e. master gardeners, certified nursery professionals).
- Set up a toll-free phone information line.
- Sponsor a “Future Gardeners of America” program for local schools.
- Work collectively as an industry to compete for leisure-time dollars of customers.

Driving Force # 5 - Increased emphasis on partnership marketing

Impact on Industry

- Fewer vendors (suppliers) on approved vendor list.
- Paperless ordering systems (EDI) and ECR tied in to scanner data at retail level.
- Stratification of vendors between mass merchandisers and independents.
- Allows better inventory control management at all levels in the industry - able to service customers better.

Proposed Solutions

- Gear up or get out (computerize).
- Night docks in shipping.
- Improve in-transit communications (cellular phones).
- “Lease out” departments in the garden center - i.e. growers become “jobbers.”
- Implement more sophisticated plant labeling and bar coding systems.

Enhancing Greenhouse Profitability
Through Improved Marketing Planning

Charles Safely - North Carolina State University

Most business managers have heard the phrase "effective marketing is the key to profitability," but many do not fully understand what this means. The tendency is to associate marketing with selling or advertising. These are, in fact, only a couple of aspects of marketing. From a managerial perspective, marketing may be defined as the total system of business activities designed to plan, price, promote, and distribute nursery products that satisfy the wants/needs of potential/present customers, while achieving the businesses' objectives.

The major emphasis in this definition is the customer, first and foremost. The business that provides customers with what they want, when and how they want it, will be the most successful. In an industry as large and diverse as the nursery industry, it is impossible to develop a general marketing program that would apply to all participants in the nursery industry because management skills, market opportunities and resource availabilities vary considerably in each part of the country. Thus, step-by-step guidelines are presented which can be used to develop an individualized marketing plan. The planning framework presented in this paper (see below) represents an application of the total strategic market planning process. It is practical, workable and with slight modification, it can be used for any specific nursery or garden center operation. While developing a market plan alone cannot guarantee success, it does insure that factors affecting the profitability and survivability of the nursery are considered.

Step 1. Analyze the present marketing situation.

The first step in the marketing planning process is to analyze the present marketing environment. Marketing objectives cannot be determined before an assessment of where the nursery or garden center presently stands in its total marketing environment is carried out. In conducting a situational analysis (Table 1), the manager typically gathers two types of information: (1) internal or business related information; and (2) external or market related information.

Figure 1. The Marketing Planning Process

Table 1. Internal and external information gathered in the situation analysis

Business related (Internal) Information:

(1) Financial resources and capabilities:

- Gross profits and net earnings after taxes.
- Financial ratios - return on investment, breakeven analysis, leverage ratio, current ratio, age of accounts receivable, inventory turnover, working capital turnover, and profit margins.
- Cash flow analysis (actual and/or projected).
- Record keeping system.
- Borrowing capabilities.

(2) Operating facilities:

- Production capacity based on land, labor, and equipment availabilities (wholesale nurseries only).
- Production scheduling of cultural practices (wholesale nurseries).
- Inventory levels by variety, grade, size, and loss rates (may affect markets targeted in the short run).
- Power requirements (Human input).
- Equipment requirements.

(3) Competitive strengths and weaknesses:

- Competitive status of company's products (name recognition, quality perception, etc.).
- Sales force capabilities.
- Market share projections (as compared to competitors).
- Competitiveness of prices - volume discounts.
- Advertising and promotion capabilities.
- Depth of product mix.
- Distribution methods and channels.
- Service capabilities.

Market Related (External) Information:

(1) Environmental constraints:

- Costs and availabilities of materials (chemicals, soil media, etc.).
- Costs and availabilities of energy (fuel, electricity, etc.).
- Economic conditions - housing starts, inflation, recession, interest rates, unemployment rates, capital availability.
- Technology advancements.
- Political environment - environmental quality, pesticide issues, etc.

(2) Market conditions:

- Market size - population, family size, number of households, rate of growth in an area, geographic concentrations.
- Market segments (alternative outlets) differentiated by age, sex, income level, education, occupation.
- Buyer purchasing habits - time, place, credit or cash, frequency.
- Buyers use habits - when, where, for what purpose.

(3) Analysis of competitors:

- Number of competitors in the market area.
- Market shares (industry surveys).
- Strengths and weaknesses in terms of prices (last 3-5 years), product mix, quality, promotion, advertising, cost structure, transportation costs.

Sources of Information:

- State or national trade associations.
- Landscape contractors or architects (can indicate plants they are currently using or plan to use and those which are difficult to obtain).
- County Extension Agents and Horticultural Specialists - Extension Service.
- State Departments of Agriculture.
- Trade publications.
- Trade shows.
- Industry surveys.
- Census data.
- The Internet.

Target Market Selection

Once possible markets have been segmented (Table 1), the task at hand becomes one of deciding which markets to target. This is based on the research findings and opportunities identified in the early stages of the situation analysis. After segmentation, certain target market options exist for the firm:

(1) Aim at the entire market (all segments) with a single marketing approach.

(2) Pursue several different segments with different marketing approaches for each segment.

(3) Focus on just one segment with a very direct marketing approach.

In the case of marketing nursery products, it is probably best to employ the second option and target 2-3 segments including a primary market, a secondary market, and a salvage market.

The old adage that marketing decisions should be based on marketing facts provides the foundation for situational analysis. In turn, the situation analysis provides basis for establishing objectives and determining practical and realistic marketing strategies and tactics. One major point that needs to be emphasized here is that the situational analysis is an ongoing part of marketing planning. Its purpose is to keep the manager aware of changes taking place inside and outside the business. It should not be viewed as a one-shot or once-a-year activity.

Step 2. Determine the marketing objectives to be achieved.

Objectives provide targets for the direction and guidance of the marketing plan. These objectives must be in line with the overall objectives of the nursery as well as with the financial objectives and production objectives. Marketing objectives are typically set in such areas as profit, return on investment, sales volume, market share, pricing, advertising, and promotion (Table 2). In determining marketing objectives the manager should be guided by a number of criteria. Marketing objectives should be measurable, specific, consistent with overall business goals, attainable and have specific deadlines. The determination of realistic marketing objectives requires a sound situational analysis. Since these objectives will guide the entire plan and its strategies they have to be realistic and clear. However, they may need to be refined over time. The setting of objectives is an ever changing part of the planning process. As market situations and competition change, so must the marketing objectives.

Examples of specific marketing objectives:

- Increase overall return on investment by __% for the next fiscal year.

- Increase specific product sales by __% for the next fiscal year.

- Increase market share by __% in "X" market by December 31, 1990.
- Increase sales volume by __% in selected regions or territories by specific dates.
- Prices should yield a minimum unit contribution to profit of __%.
- Increase manpower training by __% by a specific date.
- Achieve advertising/promotion goals in specific markets for the year.
- Introduce __ new products to fill out product mix by specific dates.

Step 3. Formulate the appropriate marketing strategies.

At this point in the process, the manager's task is to determine an overall strategy to achieve the defined objectives. There are four basic market strategy positions including: (1) market penetration; (2) market development; (3) product development; and (4) diversification.

Using a **market penetration strategy**, the nursery attempts to fill the needs of an existing market with its present product mix. This type of strategy may use a number of approaches. For example, the manager may wish to increase the number of customers in present markets, or he may wish to increase the usage of particular plants of both present and potential customers. In addition, the manager also wants to prevent competitors from taking away present customers.

A **market development strategy** is one that attempts to find new markets for the nursery's existing product mix. The manager hopes to find new uses and/or new customers in new markets for plants that are already being produced and marketed. It is, of course, possible for any manager to employ market penetration and market development strategy at the same time, since they involve the same product mix, only the markets targeted are different.

A **product development strategy** exists when the manager attempts to develop new products for customers in the business's present markets. A number of approaches may be used here as well. For example, a product improvement may be when a new plant (cultivar) actually replaces an existing plant that is slipping in the marketplace. The new product may be less expensive to produce, more appealing, or serve the customer's landscaping needs better. Or maybe current products are offered in slightly different forms (bush form, topiary, espaliered, etc.). With this type of strategy, the manager wants to make a better impression in present markets through product changes and/or additions.

A **diversification strategy** occurs when the manager attempts to attract new groups of customers by moving into totally new markets with new products. This might involve taking a new product or service to totally new markets that the company didn't previously serve. For example, a logical diversification for some nurseries may be landscape contracting or landscape maintenance. With this approach, the manager hopes to move into markets not served with new products. Diversification is the most risky of the four strategies, because it involves departure from both the product and market experience of the firm.

Step 4. Establish tactical procedures for implementing strategy.

After determining the overall strategy(ies), the next step in the planning process involves implementing and carrying out these strategies. This requires the development of marketing programs which involve tactical elements. The marketing strategies must be transformed into a set of specific

actions or tactics for accomplishing marketing goals. These tactics are often referred to as the marketing mix. Decisions concerning the marketing mix are presented in Table 3. This list is not inclusive nor do all decisions or activities pertain to every nurseryman. The marketing mix is dependent upon which target markets are selected, the type of market strategy chosen, and requirements of customers as indicated in the situation analysis.

Product Related Decisions

- Determining the most effective product mix (species, cultivars, sizes, etc.) to serve each market segment (should be based on costs and buyer demand).
- Branding the products in the product line, if possible (plant patents, etc.).
- Using attractive and efficient containers that hold up during storage.
- Provide attractive and informative labels for plant materials.
- Provide guarantees for each product in the product line.
- Modifying the existing product mix as the need arises.
- Planning and introducing new products (cultivars, sizes, etc,) when possible.
- Provide information on the care of the plants after they are sold.
- Service considerations - delivery, credit, convenient business hours.

Promotional Related Decisions

- Select and prioritize target groups and geographical marketing areas.
- Determine whether advertising is required for the target markets selected. If so:
    - Determine advertising appeals and specific messages to use in those campaigns.
    - Select appropriate advertising media such as radio, television, newspaper, road signs or direct mail.
    - Determine the size of the ads to be used.
    - Determine the duration of the advertising campaign.
    - Determine the frequency of advertising.
    - Determine how advertising effectiveness is to be measured.
- Select appropriate sales promotional media such as point-of-purchase materials, samples, demonstrations, or trade shows.
- Develop a logo that is colorful and prominent.
- Public relations events—donate to charities, community meeting place, sponsor festivals, etc.

Pricing Related Decisions

- Determine base prices for each product in each market served
- Determine the appropriate types and sizes of volume discounts used, if any.
- Determine the use of psychological pricing tactics such as prestige pricing, promotional pricing, etc.
- Determine credit policies.
- Allow consumers to buy the quality of plants they can afford.

Distribution Related Decisions

- Provide protective packaging for goods in transient and storage.
- Determine the modes of transportation to be used.
- Determine inventory requirements and maintain these requirements.
- Provide frequent small shipments, even on weekends, if necessary.

Step 5. Evaluation and control procedures

Performance of the plan must be measured, and this means that standards must be developed against which performance can be evaluated. Typically, the manager develops quantitative measures of overall planning performance such as the following:

- Comparing total sales and profits with figures from preceding years.
- Measuring performance relative to competitors (i.e., market share).
- Performing a sales analysis by breaking down sales into categories such as geographic region, primary customers, and fast-moving products.
- Measuring customer satisfaction with surveys and other market feedback.

The importance of proper and timely evaluation cannot be overlooked. Communication between the business and the customer is essential for success. Customers will try a new supplier one time. If they are not pleased with the product, they will look elsewhere. A good evaluation system and prompt corrective actions, when required, can assist managers in maintaining their individual market share.

Properly conducted, this step allows the manager to evaluate what is right and wrong and to make corrective actions. This step forces the manager to consider how the results of each planning period's evaluation shall be used to improve performance in the next planning period. Information gained in the control and evaluation analysis may be used to update objectives, to alter strategy approaches, and even change tactics to be used. When this happens, the planning process has come full circle and the entire marketing planning process begins again.

Enhancing Greenhouse Profitability
Through Improved Personnel Management

Susan Barton - University of Delaware

The most important asset of an organization is the human asset, and the best measuring device for the quality of an organization is the quality of the people. Organizations with top-quality people are more profitable because they have the most satisfied customers, the best company image and the ability to weather economic slumps. Finding and keeping good employees in one of a manager's key tasks.

Labor is an important issue in the green industry. In fact, the labor situation was cited as the number-one concern of surveyed nursery people. Labor accounts for 26 percent of sales on average for the entire green industry and 28 percent of sales for the production segment of the industry. And the cost of labor is not just the salaries earned by employees. There are many additional hidden costs such as social security, unemployment insurance, worker's compensation and fringe benefits. See the appendix for an overview of the true cost of labor.

Managers consider cutting the labor budget as a way to reduce costs. This is usually a mistake. A better idea is to increase efficiency by careful hiring, effective training, motivational policies and intelligent scheduling, which will in turn, create a quality work force that is the asset your company needs to be successful.

Often, employers don't put in as much time trying to find the right employee as they do worrying about the proper irrigation system. If growers spent more time thinking about their labor input, they could dramatically increase greenhouse performance.

Hiring/Selection

Set a goal for your company to "hire good employees and eliminate mistakes." The cost of hiring and training a new person is staggering. The turnover that results from poor personnel management results in more money spent on training, recruitment and selection; the loss of productive management time; lost business; and dissatisfied customers. Hiring decisions are so important that they are worth spending time on. Develop a planned set of steps for your hiring process:

1. Write job descriptions and position specifications.
2. Get a pool of candidates.
3. Pre-screening - basic requirements.
4. Develop a list of interview questions.
5. Interview.
6. Describe company and give timetable.
7. Check references.
8. Make a clear offer.

Job Descriptions and Position Specifications

Job descriptions characterize a job and include the duties, responsibilities and qualifications required to perform that job. Position specifications characterize a person and include the essential behavior characteristics necessary for the job.

A position announcement should include: the job's title; the experience and education necessary to do the job; duties and responsibilities of the position; the position's place in the company hierarchy; paths for advancement; on-the-job training periods; and the position's stated purpose, such as "to monitor and control pests so plants can be produced efficiently and free from insects and disease." It may also include personality traits and characteristics considered desirable for the job. A position

announcement that accurately describes the job will help potential employees determine whether they will be happy in the position.

Recruiting

The most frequently cited sources of new employees are employment agencies (specializing in this industry), high schools, trade schools, colleges, universities, classified ads and current employees. Schools often offer a job-posting service. Attend career days at local universities to present information about your company. Or develop relationships with professors who teach greenhouse courses. You may be able to give a guest lecture about the industry and recruit employees at the same time.

Some schools have formalized internships and will help place students at willing businesses. Internships provide an opportunity to screen potential employees and offer positions to the best people. Some high schools have vo-tech programs that teach horticulture and greenhouse management. You may find eager students who are not college-bound but want the opportunity to grow with you.

The green industry itself is a great source of employees. Network with your suppliers and customers. Talk to people at trade shows. Place classified ads in industry trade publications. Use your sphere of influence to look for new employees wherever you go. Think about potential employees as you interact with people throughout the day. Carry business cards to solicit potential candidates.

Consider some non-traditional sources of employees. Part-time employees offer several advantages. They allow you to quickly expand the work force to meet peak season/holiday workloads, but they rarely expect or receive benefits or overtime pay. Some employees with full-time jobs want to supplement their income with another part-time position. Other people who have caretaking responsibilities at home are not available for full-time employment but can meet a part-time schedule. Assign a manager the responsibility for scheduling part-time employees.

Disabled persons have been found to be more reliable, more loyal, have less absenteeism and remain in their positions longer than other types of employees. Also, there are tax benefits associated with hiring disabled employees.

Pre-screening

Employment applications provide the first level of screening. Ask for the applicant's full name, address and telephone number; information about the applicant's work experience, educational background and specialized training. When requesting work experience data, ask for only the last three or four employers and leave room for employment periods, job titles, company names, addresses, phone numbers and job duties. Request applicants to write a statement (no less than 25 words) about their work and career goals. You can get an idea of how serious they are and an indication of their literacy. Some companies use a short screening interview, either in person or on the telephone.

Interviewing

A comprehensive interview enhances the company's image with the candidates and sets the tone for the rest of the work experience. When management spends time conducting thorough interviews, candidates understand the importance of personnel to the firm.

Prepare for the interview by developing a worksheet to record behavioral characteristics required for the job. Plan a set of questions designed to discover those characteristics. Look for absolute traits that are essential for the job. Consider behavioral traits that provide some insight into how the candidate will be motivated. Look at the interpersonal skills to discover how each person will work with the rest of your team.

Schedule a specific time and give the interview your full attention. Outline the procedure you plan to follow so the applicant knows what to expect. Verify the application information and ask a planned list of questions. Ask probing, open-ended questions that require more than a yes-no answer. Encourage the applicant to do most of the talking. Listen for statements that may indicate sincerity, goal orientation, enthusiasm, laziness, positive (or negative) attitudes, respect for co-workers and clients, and so on. Take notes and keep a record of the information you learn during the interview.

Use pre-employment tests when appropriate. There are four general categories of pre-employment tests--ability, skill-assessment, personality and behavior tests. Ability tests reveal how quickly an applicant will learn your company's procedures and are the best predictor of job performance success. Skill-assessment tests provide an objective evaluation of an applicant's acquired skills. For example, if you need someone to perform a specific skilled task, like grafting, test the applicant's skill level on a sample plant. Personality tests assign a value to various personality traits, such as assertiveness, extroversion, sensitivity and efficiency. They often provide insight into how an employee can be motivated. Behavior tests measure whether an employee is likely to be reliable and productive.

If the applicant shows potential, give an overview of the company. Discuss the responsibilities of the position, who the person will report to, the specific benefits and perquisites, salary, working hours, and training. Avoid the temptation to hire an applicant on the spot. Provide a time frame within which you will notify the candidate.

Check references, especially former employers. Verify the information on the application and find out how the applicant interacted with fellow employees.

Selection

Don't let horticulture knowledge be the sole prerequisite for hiring. Good communications and organizational skills are also critical for many positions. Look for stability in work history with reasonable job changes. Always find out about missing times between jobs.

Use the completed worksheets and notes on each candidate to review potential applicants. Compare each applicant to a standard (the position specification) and not to one another. Discuss the candidates with at least one other member of the management staff. Avoid snap judgements, but don't ignore the hunch you feel about a potential candidate. Notify the candidate you've chosen and conduct an expectation interview to review salary and benefits and to get a commitment from the candidate.

Legal Issues

Job applicants can file charges of discrimination if they can show that the gathering of even seemingly innocent information indirectly discriminates against them on the basis of sex, age, race, religion, handicap or national origin. Avoid requests for the following information on applications and during the interview process:

- race, color, sex, religion, age, national origin or citizenship.
- age, birth certificate or date of high school graduation.
- height or weight.
- a photograph.
- future family plans, career path of spouse or activities of the applicant's children.
- club memberships.
- arrest record.
- criminal conviction, if not related to the position.
- previous workers' compensation claims, or information about the applicant's past or present physical condition not related to work requirements.
- an overseas residence or business.

When hiring non-residents, be careful to follow the letter of the law. It is up to the employee to prove their identity and eligibility to work, but the business must request that person's credentials. Probationary periods can help you identify whether you have selected the right person for the job and give you an opportunity to correct your hiring mistakes by letting the wrong people go. Be sure to use quantitative guidelines during the probationary period to measure an employee's performance. You do not need a pre-established probationary period to evaluate a new employee's performance and discharge them if they are not meeting the standards you have outlined.

Training

Your behavior during the first day on the job will set the tone for the new employee's experience. One half hour of your time can mean the difference between a positive, upbeat beginning and a confusing, overwhelming one. Some employers try to spend a little time each day of the first week with new employees to offer coaching, encouragement and guidance.

Employees need sufficient knowledge about a company's history, organization and key personnel, policies and procedures, products and services, market and company niche. They also need to learn the key technical skills and people/communication skills required for the job.

Start by offering an orientation for new employees. Much of this information can be included in an employee handbook. An employee handbook provides an opportunity to clearly state what is expected from employees and what employees can expect from you. Employee handbooks make rules easier to enforce since they apply to all workers. They also provide a level of protection against employee lawsuits. Include the following topics in an employee handbook:

Introduction - include company history and philosophy.
Hours - outline normal and overtime expectation.
Job attendance/tardiness - define excused absences and repercussions of unexcused absences.
Pay & salaries - define method of determining pay.
Benefits - include paid vacations, health and dental insurance, sick leave, extended leaves for illness, pregnancy or family matters and retirement benefits.
Drug & alcohol abuse - outline policies.
Sexual harassment - describe policy and outline steps for filing and handling claims.
Discipline - describe chain of events that will result from conduct that interferes with or adversely affects business.
Employee safety - stress importance and outline methods of reporting problems.
Smoking - establish policies consistent with state and local laws.
Grievances - outline filing procedure.
Appearance - outline dress code and grooming expectations.
Termination - include clause that reserves the right to terminate for any reason not stated in employee handbook.

Schedule regular training sessions to communicate new product knowledge and teach technical and communication skills. Once you develop a schedule--stick to it. Continue training even during busy periods, just shorten training time to 10, 15 or 30 minutes. Develop a notebook for each employee that documents training progress. Record new skills and competencies as they are learned.

People learn by example, repetition, reinforcement and instruction. Break technical skills down into the primary components and address each. Effective training sessions involve verbal and physical participation of employees. Help them retain information by letting them demonstrate new skills within the safety of a meeting. Use the following system to teach difficult technical skills:

1. you do and explain.
2. you do while trainees explain.
3. trainees do and explain.
4. trainees do without explaining out loud.

This system forces managers to think through how they complete a task so they are able to explain it clearly to employees. Role playing is a tool that works especially well with people/communication skills. Follow up training by assigning specific projects that integrate the skills you are teaching. Review the success and change the training accordingly.

Design product knowledge training sessions to focus on the benefits for the customer rather than a product's technical performance. Teach sales people to listen to the customer's needs and present products that will meet those needs. Finally, use technical product features to substantiate the benefit claims.

Distinguish between behaviors and responsibilities. Responsibility is the desired out-come. For example, an employee might be responsible for keeping a poinsettia crop pest-free. The behavior necessary to complete that task might include posting yellow sticky cards, monitoring insect activity, applying a particular pesticide with a backpack sprayer when insects reach the threshold for that crop. This definition of behavior clearly defines how management wants the employee to perform certain tasks. Training should include a description of how employees are actually supposed to do things. Include a time frame and materials required in the descriptions.

Evaluation

Conduct regularly scheduled performance evaluations. Allow the employee to conduct a self-evaluation first. Then schedule a performance review. Outline the procedure you will follow. Work from the job description for each employee. Specific job descriptions allow the manager and employee to work from the same checklist. As a result, behaviors are performed correctly or incorrectly, and evaluation is no longer a matter of opinion. Focus on observable, measurable components of a job that contribute the organizations overall productivity and performance. Quality, quantity, timeliness and cost are the four variables that can be measured and used to evaluate job performance

When there is a problem with an employee, confront the issue. Often the employee does not realize what is happening. Explain how the problem affects business and discuss possible solutions. Get a commitment from the employee on a plan of action that will alleviate the problem. Employees are likely to implement strategies they have developed and to which they have committed. At the end of the performance evaluation, agree on goals for the future. Document the discussion in each employee's file.

Managing/Leading

Motivation is not something you can do for (or to) a person. It must come from within. Employers can work to provide an environment in which employees want to work. To do this, identify the causes of high or low motivation, job satisfaction and morale. Also learn how human needs affect motivation and morale. Common motivators include self-esteem; prestige and status; feeling of acceptance and belonging; recognition and appreciation by others; security and hope for our future; power and influence; reasonable independence and freedom of action; significant participation and involvement in activities affecting us; and continuing growth and realization of potential through achievement, accomplishment and contribution. Talk to your employees and find out about their personal goals. Develop a strategy that links those personal goals with goals of the company.

Compensation

Develop a pay structure that appropriately compensates employees for their contribution to the company and accurately reflects the resources of the company. Several industry trade journals conduct wage and salary survey annually. Use these surveys to get an idea of the prevailing wage for different job categories in different regions of the country. Communicate the true compensation by reviewing the labor cost estimation worksheet with each employee (Figure 1).

Hourly vs. Salaried

There is a difference between hourly and salaried employees. A salaried employee is a professional. He or she works as many hours as necessary to get the job done. Extra hours on the job don't earn a salaried employee extra pay. On the other hand, salaried employees don't forfeit any pay for taking a few odd hours off for personnel reasons. The commitment ot extra time and effort when necessary presumably justified the professional's decision to use some time for personal purposes.

Federal law obligates employers to treat hourly wage earners differently from salaried workers. An hourly worker remains entitled to time-and-a-half for every hour worked beyond the 40-hour weekly standard. But the hourly worker also sacrifices income when his or her work week falls below the 40-hour standard. Unlike salaried workers, hourly workers sacrifice income if they take time from the work day for personal purposes.

Incentive Pay

Incentive pay can be used, in part, to motivate employees to do a specific task better or faster. To be successful, you must link incentive pay with performance over which employees have control. Start by establishing standards for piece work. Try to anticipate changes that will affect standards and loopholes that will reduce productivity. If quality is important, you can't reward quantity at the expense of a quality product. Involve employees in the development of an incentive-pay program. Make sure they feel comfortable that their pay won't decrease. Excite them about the opportunity to earn more. Provide feedback to employees by posting productivity numbers. Manage the system with a computer program that provides daily printouts on each worker's performance. List incentive pay separately on the weekly checks for positive reinforcement.

Some nurseries use vacation time as incentives for non full-time employees, measuring attendance and on-time arrival. People think twice about missing work, and this plan rewards the people you want rewarded.

One greenhouse uses skill levels, character traits and tenure to award incentive pay. They have developed two skill lists--one for production skills and one for retail skills. Each skill is rated according to its level of importance to the company and level of difficulty. Employees are rated on a scale of 1 to 10 on their level of proficiency at each task. A grade of 1 to 6 does not warrant compensation; however, a grade of 7 to 10 warrants varying extra hourly compensation. This system motivates employees to learn new skills.

The process also rewards desirable character traits such as dependability, accuracy and judgement. Compensation is raised based on evaluation of these traits. Quantifying these characteristics provides an opportunity to discuss sensitive issues. The third factor in the system is tenure with the company. Employees receive additional compensation for years of service after the second year. Experienced employees are valuable to the business and rewarded for staying.

Every employee is evaluated once a year by two managers and has an opportunity for self-evaluation. The scores are reviewed by the managers with the employee and compensation set for the following year.

Bonuses

Although even the most devoted employee will not work for pay that falls substantially below what peers in the industry earn, salary increases are not the only way to reward productive employees. Reward excellent performance with bonuses or offer an unscheduled holiday or increase in annual allowable vacation. Use praise to build trust and communicate that good performance is recognized and appreciated. To use praise effectively, be consistent with immediate and enthusiastic recognition whenever it is warranted. Be specific about exactly which accomplishment you are acknowledging. Elaborate upon the benefits to the company that result from the employee's contribution.

Opportunities

Strive for high job satisfaction by allowing employees to organize their own work as much as possible. Structure jobs to provide variety and reduce boredom. Set goals with employees so they feel a sense of accomplishment and achievement. When career advancement is limited, offer employees the opportunity to cross-train and stimulate other interests through variety. Management and administrative positions are limited in a small business, but there are many other areas of responsibility that can enlarge and enrich a job.

Teambuilding

Build teams to improve communication, develop relationships, establish trust and ultimately increase profits. An environment characterized by team work will be more receptive to customer demands. Start by taking stock of the employees you have. List each employee's abilities and characteristics. Think about the roles each might play in a team. Brainstorm one or more new projects and solicit input from all employees. Observe interest expressed and along with your prior evaluation, assign employees to work in teams on projects they have identified. Teams work best if you keep a scorecard recording team progress and increased productivity. Also, establish a decision-making and conflict resolution process. Describe problems as opportunities to learn and continue to improve. Recognize employees who are working effectively and provide immediate positive reinforcement. Celebrate when team goals are reached.

Termination

The current legal climate has made it difficult to fire an employee at will. The number of wrongful-discharge cases is increasing all the time. Even though most cases are settled out of court, the settlement and legal fees can be costly. To avoid unnecessary litigation, develop an employee-termination policy. Conduct regular employee evaluations and maintain records of the reviews. It is easier to discharge an employee with several written evaluations that document inadequate performance.

When you have to terminate an employee, make the termination interview as non-threatening as possible. Assign the direct supervisor of an employee to conduct the termination interview. Avoid anger and personal attack.

Insurance

Workers compensation is a significant expense for each employee. Workers compensation laws and regulations vary from state to state. Consider implementing a self-insurance program, in which you save a specified amount per employee each pay period to cover potential claims. Couple such a program with aggressive safety training to reduce on-the-job injuries. Create a climate that values safety.

Two main issues affect labor efficiency. The first is individual efficiency or job performance, and the second is adjusting the supply of the various qualities of labor available to meet job requirements.

Hire excellent people, well-suited to the assigned jobs. Motivate employees with a combination of pay incentives and work environment adjustments. Train employees to help them reach their full potential. Then schedule employees efficiently by thoroughly understanding the needs of the business. Use the most significant asset of your company--your employees--to create a profitable and successful greenhouse business.

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Labor Cost Estimation Worksheet		
Cost Item	Cost to **Employer**	Income to **Employee**
Direct wage costs:		
1. Total regular hours: hrs/wk x # wks = hours Overtime hours: hrs/wk x # wks = hours		
2. Cash wages (hrs x $ /hr)	= $	= $
3. Overtime wages (hrs x $ /hr)	= $	= $
4. Cash bonuses ($ or %)	= $	= $
5. **Total adjusted cash wages** (total lines 2 through 4)	= $	= $
Mandatory wage costs:		
6. Social Security	= $	= $
7. Federal unemployment insurance	= $	= $
8. State Unemployment insurance	= $	= $
9. Worker's compensation	= $	= $
10. Other	= $	= $
11. **Total value of mandatory costs** (total lines 6 through 10)	= $	= $
Value of fringe benefits:		
12. Insurance - life	= $	= $
health	= $	= $
dental	= $	= $
other	= $	= $
13. Retirement (firm's contribution)	= $	= $
14. Uniform (purchase/rental/cleaning)	= $	= $
15. Transportation me/day x days x 4/mi	= $	= $
16. Educational expense	= $	= $
17. Other	= $	= $
18. Other	= $	= $
19 **Total value of fringe benefits** (total lines 12 through 18)	= $	= $
20. **Total labor costs** (total lines 5, 11, 19)	= $	= $
21. Hours paid but not worked holidays hrs. vacation hrs. sick leave hrs.	= hrs (total)	= hrs (total)
22. **Total hours on the job** (total line 1 and line 21)	= hrs	= hrs
23. Total costs per hour on the job (line 20 divided by line 22)	= $	= $

Figure 1. Labor Cost Estimation Worksheet

Enhancing Greenhouse Profitability Through Product Mix Management

Bridget Behe - Michigan State University

After looking at cost information, you are better prepared to begin considering which crops to grow. Many factors in addition to cost will, however, need to be considered. Turning inventory over into sales and profits will be critical to your business success.

First, consider your markets. A good understanding of who ultimately buys and enjoys the product you grow will help tremendously. Insight into customer desires helps you, and your customers, anticipate their demand. There is a growing trend, among smaller producers especially, to have a retail outlet of their own. In the 1998 Seasons Sales Summary, over 60% of small firms (with annual sales less than $250,000) had their own retail outlet compared to only 40% of large firms (with annual sales over $2 million). Having your own retail facility can give you a distinct advantage in your ability to monitor sales and customer preferences. Both can help you anticipate your production mix for the next year.

There are differences among gardeners that will affect who buys what plants. Not all Americans garden for the same reasons. *Organic Gardening* magazine researchers identified four segments, or groups, of American gardeners: Dabblers, Cultivators, Decorators, and Masters.

Dabblers accounted for 61% of gardeners, but only 50% of sales. They spend only a few hours in the garden each week and likely would rather be playing golf or doing anything other than gardening. Since they spent so little time in the garden, they will want to buy what they know or what will make them instantly successful. They are good candidates for the most familiar annuals and perennials. They will probably buy only red poinsettias and geraniums. They don't want to learn a lot about gardening, but may slowly develop some new interests.

Cultivators accounted for 18% of gardeners and 17% of sales. These gardeners spend a few more hours each week in the garden, but are mainly interested in vegetable gardening. They want to reap a harvest from the land. When marketing plants to them, emphasize qualities of plants that are edible, not just ornamental. Any plants that are edible, including herbs, are good bets for them.
Decorators accounted for another 18% of gardeners, but 29% of sales. These gardeners are most interested in making their homes more beautiful. They color coordinate flower color with home decor. They bring living space outdoors in decks and patios. They do spend more time in the garden. They are most likely to buy non-red flowers and choose flowers that match a favorite color inside their homes.

Masters accounted for 3% of gardeners, but 4% of sales. They, like the Decorators, are interested in something a bit different. Use this group as "opinion leaders" by giving them new plants to try in their own gardens. They have lots of friends ask them gardening questions. They can recommend you and the new plants you've got. Recruit Masters as marketing allies and get feedback from them frequently. Gardeners don't all have the same interests or the same level of interest. Meet them where they are. Provide them with choice they'll see as appropriate. Don't push new plants on clients that want the old standbys, but be receptive to customers looking for something new and different.

Color preferences vary and there are fashion trends in color. These trends are important, but only for *some* gardeners. Most will buy what they know and stick to the basics. Less experienced gardeners probably prefer red flowers on green foliage, and will comprise a great percentage of people who buy the top ten annuals. More experienced and appearance-conscious gardeners are likely looking for the hot "new" colors. How do you keep up with them? Look for "new" hot colors in fashion and home decor. Keep an eye on towels and sheets for a hint of what is next to be hot. It takes a few years for the color trends you see in fashion to make it outside to the garden.

After investigating your customers, you are ready to think about specific plants to grow. Which annuals are you most likely to sell? If you have gardeners who are typical weekend gardeners, like the Dabblers, your best bet for annual sales are the top twelve best selling according to the *Season Sales Summary*. Each year, the Season Sales Summary reports the best selling annuals and the top cultivar for each species. In 1998, these were:

Impatiens Super Elfin, Accent
Geranium Americana (cutting) and Pinto (seed)
New Guinea Impatiens (Paradise)
Pansy Bingo
Petunia Wave, Madness, Ultra
Marigold Bonanza
Begonia Cocktail
Vinca Cooler
Tomato Better Boy
Dusty Miller Silver Dust
Zinnia Dreamland
Snapdragon Tahiti

These are plants most gardeners will recognize, although the cultivars might be new to them or they might be aware of cultivars. If gardeners appear to be interested in color, introduce new cultivars to them by color. Most weekend gardeners won't be too interested in the new or more unusual plant, but some are. The more avid their interest, the more likely gardeners are to try something new. Anticipate this demand in your market. See how many want the top ten annuals and see how many are looking for something new and different.

Consumers, retailers, and first producers are faced with an often overwhelming number of cultivar choices for any crop. There are over 30 red poinsettia cultivars on the market today, and an additional 30 pink, white, and novelty cultivars. Any seed catalog displays numerous petunia and pansy cultivars. The choices of mums can be even greater than poinsettias. Consider color preferences, crop timing, post-harvest shipping characteristics, holding, ability, and time to mature.

From the season sales summary, we identified the top twelve best selling perennials:

Echinacea Magnus
Rudbeckia Goldsturm
Hosta albo marginata
Coreopsis Moonbeam
Lantana New Gold
Verbena Homestead Purple
Clematis jackmanii
Delphinium Magic Fountain
Salvia May Night
Astilbe Fanal
Hemerocallis Stella d'Oro
Heuchera Palace Purple

Most producers have seen perennials and know they are not "new" anymore to plant production. With some customers, this is not true. Perennials aren't new to *some* gardeners, but they are new to *most* gardeners. Weekend gardeners might not be familiar with most perennials on this list, even though they may have seen some at their local mass-merchandiser. They might think that all perennials are low maintenance and need little attention. Perennials don't flower like annuals do; most only show color a few weeks in the year whereas annuals will have color for a few months of the year. Yet, the perennials listed here are fun and relatively easy for most gardeners to grow. Experience is a good teacher and these are easy perennials to get most gardeners started.

How do you know what size container to grow and market plants in? Product sizes will be vary with the retail outlet. There has been a trend in the late 1990s for production to move to larger container sizes. Baskets are bigger, cell packs are bigger, even four-inch pots are deeper than just a few years ago. Mass-merchandisers like large cell pack sizes for bedding plants because they don't need to be watered as often. Producers like them because they can make a bit more on each plant. Consumers appear to demand more mature "instant color" as the bedding plant season progresses. Traditional florist grade chrysanthemums and poinsettias are larger and have more flowers than many mass-market-quality plants. Before deciding on containers, make a survey of your market. If it seems quite traditional, you should stay mostly with the container size consumers are used to seeing. It may take a while for them to

change. However, you can try to introduce some larger containers, bringing larger prices and hopefully larger profits. Most markets are ready for this upgrade, but do it slowly.

Now that you have narrowed the field of plants you want to grow, have given some thought to container size, you are ready to make your production plan. The concept of square-foot-weeks helps you plan your inventory in the space and time available. If you have a greenhouse that measures 20 feet by 120 feet, you have 2400 square feet each week to work with. This may be something less if you have benches, so measure that and see how much production space you have. For our example, we'll use 2100 square feet of bench space each week for production.

If you want to finish flats that measure 12 inches by 18 inches, you need 2.5 square feet to finish them, spaced flat to flat. If you give each flat 3 square feet of space, you can finish 700 flats in this space. But, you can finish 2100 6-inch poinsettias at a tight (12 inches on center) spacing in the same area. If you spread them out to 18 inches on center, you can finish only 933 poinsettias.

However, not all flats take the same amount of time. If you grew all marigold flats to sell May 15, you would have to sow them all eight weeks earlier. If you finish pansy flats from plugs, you may need only 12 weeks compared to 20 weeks if you grow them from seed. This is why plugs are sometimes an economical alternative for smaller growers, even though the cost is higher. When you account for losses in germination and the number of weeks you need to heat and grow pansies, you may be better off buying in plugs.

Use square-foot-weeks as a tool to help you manage inventory and determine costs. Calculate how much growing space you have. You may choose to not count space overhead for baskets, even though they are there and growing. Calculate how much bench space you have to determine production square footage. Then, calculate how many weeks you need the crop to grow the crop. The number of weeks multiplied by the amount of space, gives you square foot weeks to finish that crop.

Managing Inventory

An accurate crystal ball in the greenhouse industry is about as common as a blue rose. Weather in local markets is the single most critical variable in the marketability of greenhouse crops. A rainy, cold spring can ruin bedding plant sales. A snowy Valentine's Day can be disastrous for delivery and plant material. A sunny Mother's Day weekend can sell out quickly. A warm fall can be welcome in cooler climates and bring in sales where none were expected. If you have it in color when the weather cooperates and the people want it and you have it at a competitive price, you probably can sell it.

It is hard to be prepared, but here are some things you can do if you're just getting started. You are mainly concerned about temperature and rainfall. First frost-free date is a good time to plant and last day before frost will give you an idea of growing season. Have tender plant material available a 2-4 weeks before this date and hardy material 4-6 weeks before. You can find historical weather data for your markets on the Internet or from local sources. Ask your county extension staff about weather information. They will have some resources for you to use. Another great, readily available resource is the Old Farmer's Almanac. If customers plant too early and lose purchases to a late spell of cold weather, you can capitalize on the replacements. But beware, your professional advice may have spared the second purchase.

Enhancing Greenhouse Profitability
Through Improved Materials Handling and Distribution

Richard Harkess - Mississippi State University

Shipping and handling have been reported to be one of the areas of greatest need for improvement in labor savings. It is an area that has been improved little (Hammer, 1998). Shipping is very labor and time intensive. There are several aspects of shipping and handling that can be addressed to improve profitability including: product movement in the greenhouse, the shipping staging area, shipping and packaging systems, and packaging. A greenhouse business can not survive if its product does not make it to market. Either you need to bring the market to you or move your product to the market. Bringing the market to the production site is the primary concern of retail greenhouse operations. Moving the product to the market is a primary concern of wholesale greenhouse operations. Whether selling retail out of your greenhouse or shipping to distant markets, profitability is increased when the product arrives at market in the best possible condition.

Increasing profitability may start with improving plant keeping quality in the retail location. Ethylene and temperature fluctuations during shipping often wreak havoc with plants. Choose cultivars that are known for their resistance to these factors. To determine appropriate cultivars, check with your seed supplier or read about the many trials that are conducted and published annually in the trade press. The industry has moved to larger container sizes to reduce the rapid drying of the cells on the retail shelf. There is a trade off to consider between greater shelf life and increased media costs.

Hardening-off plants by subjecting them to lower temperatures, withholding fertilizer, or water can help extend shelf life. Cooling the plants before loading onto delivery trucks will reduce excess respiration and transpiration during long distance shipping even when using refrigerated trucks. Temperatures in the trucks should be kept between 50E and 65EF depending on the plant. In Michigan, one grower recommends shipping bedding plants at about 65EF, poinsettias around 62EF, and Easter lilies at 50EF, while a grower in Oklahoma recommends shipping most plants at 50EF early in the season and at 60EF in late season to avoid to great a shock (Aylsworth, 1997). Allowing the plant foliage to dry before loading can reduce humidity and the possibility of disease erupting during shipping. Maximizing ventilation or shipping in a refrigerated truck can reduce drastic temperature fluctuations during shipping. Make sure that the air circulation is not blocked resulting in hot spots in the trailer. Clean the trucks between loads to reduce decaying plant debris which can contribute to ethylene build up (Davis, 1998a).

A recent informal survey of growers asking about what changes have had the most impact on their business listed materials handling among the most frequently mentioned areas for reduction of production costs (Hammer, 1998). An investment in concrete floors, walks, and driveways improves the effective use of materials handling equipment. It is an investment that will save money in the long run.

Among the current most popular systems for materials handling is the use of metal shipping carts. These carts are useful throughout the greenhouse in every stage of production from propagation to loading, shipping, and delivery. Choosing a cart will depend on your needs and customer requirements. Determine your minimum aisle and door width and allow a 6 inch clearance for ease of maneuverability. Tire size, shelf material, and collapse for storage are all factors to consider (McLean, 1997; Socha, 1997). Most manufacturer's carts have adjustable shelves. A cart with six shelves can carry as many as 42 10x20 inch flats at a time. The carts are easily maneuverable and most people have no problem handling several linked, fully loaded carts (Socha, 1997). If you want to use carts but don't want to install concrete walks, then select carts with larger wheels that will move easily over gravel. Carts with tow bars can be linked and towed by an electric cart to quickly move a large volume of plant material through the greenhouse to the shipping staging area (Davis, 1998b).

These carts offer several advantages in product handling including being reusable, durable, and, with routine maintenance, long lasting. Carts are better for shipping plants than enclosing them in hot, dark boxes (Socha, 1997). They help keep the product fresher because the plants spend less time on the truck. Loading efficiency is greatly increased. What once took 20 to 30 hours to load can be done in 2 to 3 hours using carts. The carts have moveable shelves that allow great flexibility for plant height maximizing space use. In addition, the use of carts reduces the time required for making a delivery and many retailers like to use them as display racks. When delivering your product to the retailer, it is easy to offload the loaded carts and load the empty carts from the retailer. There are many designs and styles of these carts available. Collapsible carts offer an additional advantage in reduced space required for return shipping. The disadvantages to using carts is the added inventory of the carts, maintenance, damage and loss while at the retailer. Some wholesalers have reported that retailers will often use the carts for other company's products. In these cases, the carts are often not empty for pick-up and return. This can add to your cost by increasing the number of carts needed or by added time at the retailer waiting while the carts are emptied. To combat this problem, some growers do not leave carts with the retailer.

Before investing in carts consider the added expense of maintenance and storage. The carts require considerable space while waiting for loading on the shipping trucks and space needs to be allotted for storage of empty carts. Regular maintenance is worth the expense to have the carts ready for the next season. Switching to carts should not be done half way through the season. This can create problems with coordinating two shipping systems (Socha, 1997).

Pulling orders can be one of the most time consuming parts of shipping. Some growers have increased order pulling efficiency by centralizing it. Order filling takes place in one location. The shipping room is lined by racks that have been filled with flats ready to ship. The racks are filled in the evening for the next day's shipping and in the busiest season they are kept filled during the day as well. When an order is ready to be pulled, the order puller only needs to walk up and down the aisle pulling the required flats. It has eliminated the need to run all over the greenhouse to fill orders. Each order, once pulled, is put on a cart or boxed for immediate shipment.

There are several options in product distribution: owning your own trucks, joining/forming a cooperative, contracting truck services, or relying on commercial shipping operations. Your product, market, and size of operation will help determine the best method of product distribution.

If your market is primarily within one half to one day's drive of your operation, owning your trucks may be a feasible means of product distribution. Cost of maintenance, depreciation, insurance, equipment replacement, driver salaries, and market distribution need to be considered. If your market is spread over a large geographic area with customers sparsely located, the costs in mileage and driver time may not be cost effective. The advantages to owning your own trucks include control over product handling during shipping, and customer contact. In addition, if you are working under a guaranteed sales contract, it allows you to pick up unsold product to be returned.

Instead of buying additional trucks that may sit idle during slower times of the year, consider leasing the additional trucks you need. By leasing you will avoid the added costs of maintenance, repair, insurance, and vehicle registration (Davis, 1998b). A 24-foot truck with lift gate rented for three weeks cost about $1000 in the Hope, Indiana area in 1997.

Contracting with a trucking company to distribute your product is another means of getting your product to market without the requirement of owning your own trucks. This type of arrangement can be very effective as long as the trucking company is informed about the required conditions for hauling your product. The biggest disadvantage is in putting your crop in the hands of people who may not be trained to handle plants. This may result in a reduced crop quality as a result of shipping conditions.

Cooperatives centered around product marketing and distribution are an important means of getting the product to the customer in several countries. Usually the grower will enter into an agreement with the cooperative to sell either a specified percent or all of their product through the cooperative sales office. The cooperative may provide a distribution network which includes picking up the crop from your greenhouse and then distributing it with other grower's crops to the consumer. In order for a cooperative of this type to work effectively, there needs to be a concentration of growers within a relatively small area to minimize distance to the distribution center. In joining a cooperative, the grower may have to give up some independence concerning what crops and how much is grown. There is also little grower recognition by the consumer. The advantages to joining a cooperative include a reduced marketing staff, no equipment or trucks to purchase, and an increased market through better distribution (growers can buy items with cooperatives at reduced prices). A cooperative which gathers crops from several growers can act as a re-wholesaler and offer its customers a wider range of product than is available from an independent grower. By joining a cooperative, it may be possible to reach customers you were unable to afford to sell to before because the volume needed by the customer was too small.

An alternative to forming or joining a cooperative is to make use of cooperative shipping. In 1990, in Oregon a system was devised in coordination with area truck brokers allowing growers to ship small orders for a reasonable price by combining orders with other growers on the same trailer (Cuny, 1997). Shipping prices are controlled by pooling orders with similar destinations. Each grower is charged with their portion of the load and final destination.

Freight charges are usually calculated by including mileage, weight, dollar value, and volume (Ooykaas, 1998). One nursery, came up with an equation to use in an attempt to help nurseries determine total freight and drop charges. This formula has been proposed as an equitable method of splitting shipping costs on combined orders. The equation uses only mileage and volume factors to evenly divide shipping costs among the nurseries receiving deliveries. It is calculated by taking the total mileage from the point of origin to the final destination and dividing each customer's distance from the origin by this number. This results in a percent of the mileage the load is carried. This number is added to the percent of the load for each respective customer. Divide this number by 2 to arrive at the percent of the total freight and drop charges to bill each customer (Ooykaas, 1998). This equation can help determine shipping costs for split orders from a common ship point.

Depending on the product and the quantity to be shipped, commercial package delivery or air freight companies may be a feasible means of product distribution. Plugs, liners, and cuttings are often shipped using these companies. Many of these companies specialize in quick delivery times which can reduce product damage due to shipping. Using a package delivery company once again takes the product handling out of the grower's control. They are also not feasible if shipping large plants that are easily damaged by rough handling.

Computers are quickly becoming an important tool in organizing shipping. Software packages exist that automate ordering, order pulling, and shipping routes (Davis, 1998b; Hopkins, 1998). Shipping software can reduce shipping costs 10-20% by getting a better handle on per mile costs, wage costs, and drop costs. Some systems can track production schedules and track billing, ordering, and labor expenses. Integrated with mapping software, the Plant Inventory Control and Account Software from Innovative Software Solutions can map delivery points, distances, and plant material needed for each stop (Davis, 1998b). The computer will generate shipping lists for each delivery including the delivery route, mileage, and order lists. Workers are told by the computer what plants to pull for shipping and how to arrange the orders in the shipping area for each delivery route. Computers are increasingly becoming indispensable for production scheduling, calculating costs, and inventory control.

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Enhancing Greenhouse Profitability Through Improved Equipment Purchasing

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The greenhouse industry has become a mature industry after many years of phenomonal 10% growth per year. In a growth market, producers could produce a good product and find a market for it and be fairly sure of making a profit. Success in the greenhouse business requires both technical and business management skills. In a mature market, competition is more intense and managers must focus on cost controls to stay competitive. Greenhouse managers who are evaluating whether or not to adopt new technical aspects of the greenhouse but also on the bottom line. Since labor is the highest cost in most greenhouse, representing 35% to 40% of sales, many managers are considering purchasing labor saving equipment such as flat fillers and transplanters. A major goal of greenhouse managers should be to maximize the firm's profits. Thus, managers must determine what the purchase of new equipment will do to the bottom line.

Evaluate Strategic Alternatives

Once alternative strategies have been selected, they need to be evaluated. This is the stage at which you will want to do some kind of financial analysis. You will want to follow three basic investment criteria:

- Larger benefits are preferred to smaller ones
- Early benefits are preferred to later ones. This takes into account the time value of money i.e., a dollar today is worth more than a dollar tomorrow.
- Safety is preferred to risk.

In addition to financial analysis, you will also want to analyze how these alternatives address the firm's other objectives. Some items to consider are:

- Which alternative will best enable the firm to reach its desired objectives?
- Which alternative best matches the firm's skills and resources (financial, technical, personnel, etc.)
- Which alternative best meets management's personal preferences or sense of social responsibility?
- Which alternative minimizes the creation of new problems?
- What other activities am I involved in now, and how will each alternative impact those?
- How much time will be required incorporate each efficiently?

Don't forget to include the employees in the planning and evaluation process. Employees are often closer to problems than owners/managers. They often can contribute to recommendations and solutions to problems. Knowing that their opinion is valued also can improve their job satisfaction and productivity.

Select a Basic Strategy

Selection of the final strategy may involve trade-offs among various objectives. One alternative may offer the greatest financial returns, but it may be inconsistent with other objectives. At this point, the manager must make a decision as to which objectives are most important.

Quantitative Tools to Aid in Planning

American businesses are using more sophisticated techniques in planning than ever before. The increased power of microcomputers is making these techniques available for small businesses as well. Specialized analytical programs will continue to be developed for the greenhouse industry to help analyze

alternatives. We will look at two alternatives as an example here. We will assume a greenhouse that produces 50,000 bedding plant flats per year. The greenhouse is considering buying a small flat filler that costs $6,900 and should last 10 years or a transplanter that costs $35,000, lasts 10 years and can transplant 9,000 plugs per hour.

To make some comparisons let's assume that labor costs $8 per hour which includes the employers cost of benefits. With manual labor, it takes one minute to fill a flat and 3 minutes to transplant a flat with 36 plugs. The flat filler can fill 8 flats per minute and requires two employees, one to feed the flats and one to take them to the greenhouse. The transplanter requires 5 people: one to feed plug flats, one to fix flats that the machine misses, and three to move the flats from the transplanter and take them to the greenhouse. Thus, the labor savings are as follows.

Flat Filler

Manual labor for 50,000 flats @ 1 min/flat and $8 per hour	$6,666.67
Flat Filler for 50,000 flats @ 8 flats/min and 2 people at $8 per hour each	$1,666.67
Difference is 60 total hours manually vs. 240 hours using a flat filler	$5,000.00
Manual system requires 4 times as much labor	

Transplanter

Manual labor for 50,000 flats @ 3 min/flat and $8 per hour	$20,000.00
Flat Filler for 50,000 flats @ 9,000 plugs/min, 36 plugs per flat and 5 people at $8 per hour each	$8,000.00
Difference is 20 flats/hr/person manually vs. 50 flats/hr/person	$5,000.00
Manual system requires 2.5 times as much labor	

Intuition

The technique most commonly used by greenhouse owners in the past is intuition. Good management is part science and part art, so intuition should not be discounted. However, a more sound plan will probably be developed with the combination of intuition and a more quantitative method to measure the potential returns.

Payback Method

After intuition, the payback method is probably the most common method used by greenhouse owners/managers in making investment decisions. In this method, the manager determines how soon a proposed investment will pay for itself, "the payback." Our flat filler example requires an initial invest of $6,900 and saves $5,000 per year in labor costs will have a payback of 1.4 years (In Table 1, $6,900/ $5,000 = 1.4 years). Managers who use this method generally set a maximum length for the payback period and reject investment alternatives that exceed the maximum payback period. Of several alternatives, they choose the one with the shortest payback.

While the payback method is simple and easy to use, it has some serious limitations. It does not take into account the size of the return. For example, our transplanter costs $35,000 initially and save $12,000 per year in labor costs. Its payback is 2.9 years (In Table 1, $35,000/12,000 = 2.9 years). Therefore, the manager would chose the flat filler instead of the transplanter. However, both systems are expected to last for 10 years, and over the 10 year period, the flat filler yields higher returns. The payback method ignores the benefits occurring in the years after the payback period. Another drawback of the payback method is that it ignores the time value of money. It gives equal weight to a dollar received in year one and year two, for example. But $1.00 received in year one could be invested and will be worth more than $1.00 received in year two.

Table 1. Analysis of Investing in a Flat Filler or Transplanter using the Payback Method.

Year	Flat Filler	Transplanter
0	(6,900)	(35,000)
1	$5,000	$12,000
2	$5,000	$12,000
3	$5,000	$12,000
4	$5,000	$12,000
5	$5,000	$12,000
6	$5,000	$12,000
7	$5,000	$12,000
8	$5,000	$12,000
9	$5,000	$12,000
10	$5,000	$12,000
Total Benefits	$43,100	$85,000
Payback Years	1.4	2.9

Net Present Value

The Net Present Value method uses the time value of money. The net present value of an investment alternative is simply the difference between the present value of the benefits and the present value of the costs. If the net present value is positive, the financial answer is to invest, or to choose the alternative with the highest net present value.

To take into account the time value of money in investment decisions, all costs and returns are discounted so that they are expressed in today's dollars. Discounting is merely the reverse of compounding. Compounding tells how much a present dollar will be worth in the future. The future value of $1 equals the present value times the compound interest rate. The formula is: $FV = PV \times (1+i)^n$ where:

FV = Future value
PV = Present value
i = Interest rate
n = Number of years.

Thus, at a 5% interest rate, $FV = \$1 \times (1+.05)^1 = \$1.05$.

To find the present value, we just rearrange the formula to solve for PV:

$$\frac{FV}{(1+i)^n} = PV.$$

In this case, the i represents the discount rate, or the rate used to discount future dollars to represent their present value, or value today. The discount rate can be thought of as the interest rate plus a risk factor. Currently, Certificates of Deposit are totally risk free and range from about 3.5% to 5% depending on how long you agree to tie up your money. So you may want to chose and interest rate of 3% to 5% and add 2% to 3% to reflect the riskiness of growing and marketing greenhouse crops. A more simplified formula is:

PV = d x FV where:

d equals the present value factor which represents the value of $1.00 to be received at the end of the designated year and discount rate from Table 2. You can see that $1 received 20 years from now is worth only $.06 in today's dollars with a discount rate of 15%. With computer programs, we do not need to do all of these calculations; the computer will do them for us. And this allows us to take into account other factors such as depreciation and income tax. At an income tax rate of 15%, and using the 7 year declining balance method, we can calculate the net present value of investing in the flat filler and transplanter.

The net present value is the sum of the present values for each year minus the initial investment cost. In the example given earlier, using a discount rate of 8%, the net present value of the transplanter is greater than the net present value of the flat filler. The flat filler would be chosen based on the payback method. But the net present value method takes into account the time value of money, the relative sizes of the net present values, and the costs and returns for the entire length of the investment including those after the payback period. The one drawback to the net present value method is that it is only as accurate as the discount rate chosen. Since both items have a positive net present value, both should be purchased if funds are available under the assumptions in this example.

Table 2. Present value of $1.00 to be received at end of year indicated.

Year	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%
1	.952	.943	.935	.926	.917	.909	.901	.893	.885	.877	.870
2	.907	.890	.873	.857	.842	.826	.812	.797	.783	.769	.756
3	.864	.840	.816	.794	.772	.751	.731	.712	.693	.675	.658
4	.823	.792	.763	.735	.708	.683	.659	.636	.613	.592	.525
5	.784	.747	.713	.681	.650	.621	.593	.567	.543	.519	.497
6	.746	.705	.666	.630	.596	.564	.535	.507	.480	.456	.432
7	.711	.665	.623	.583	.547	.513	.482	.452	.425	.400	.376
8	.677	.627	.582	.540	.502	.467	.434	.404	.376	.351	.327
9	.645	.592	.544	.500	.460	.424	.391	.361	.333	.308	.284
10	.614	.558	.508	.463	.422	.386	.352	.322	.295	.270	.247
11	.585	.527	.475	.429	.388	.350	.317	.287	.261	.237	.215
12	.557	.497	.444	.397	.356	.319	.286	.257	.231	.208	.187
13	.530	.469	.415	.368	.326	.290	.258	.229	.204	.182	.163
14	.505	.442	.388	.340	.299	.263	.232	.205	.181	.160	.141
15	.481	.417	.362	.315	.275	.239	.209	.183	.160	.140	.123
16	.458	.394	.339	.292	.252	.218	.188	.163	.142	.123	.107
17	.436	.371	.317	.270	.231	.198	.170	.146	.125	.108	.094
18	.416	.350	.296	.250	.212	.180	.153	.130	.111	.095	.081
19	.396	.331	.277	.232	.194	.164	.138	.116	.098	.083	.070
20	.377	.312	.258	.215	.178	.149	.124	.104	.087	.073	.061

Table 3. Net Present Value Analysis of Purchasing a Small Flat Filler for $6,900 Discounted at 8% and an Income Tax Rate of 15%.

Year	Item	Outlay & Depreciation	Effect after Income Tax (15%)	Reduced Labor costs	Income tax effect (1-.15=.85)	Annual Amount
0	Initial outlay	$ 6,900	$ (6,900)			$ (6,900)
1	Depreciation Tax Shield (10.71%)	$ 739	$ 111	$ 5,000	$ 4,250	$ 4,361
2	Depreciation Tax Shield (19.13%)	$ 1,320	$ 198	$ 5,000	$ 4,250	$ 4,448
3	Depreciation Tax Shield (15.03%)	$ 1,037	$ 156	$ 5,000	$ 4,250	$ 4,406
4	Depreciation Tax Shield (12.25%)	$ 845	$ 127	$ 5,000	$ 4,250	$ 4,377
5	Depreciation Tax Shield (12.25%)	$ 845	$ 127	$ 5,000	$ 4,250	$ 4,377
6	Depreciation Tax Shield (12.25%)	$ 845	$ 127	$ 5,000	$ 4,250	$ 4,377
7	Depreciation Tax Shield (12.25%)	$ 845	$ 127	$ 5,000	$ 4,250	$ 4,377
8	Depreciation Tax Shield (6.13%)	$ 423	$ 63	$ 5,000	$ 4,250	$ 4,313
9				$ 5,000	$ 4,250	$ 4,250
10				$ 5,000	$ 4,250	$ 4,250
	Net Present Value, 8%discount rate					$ 22,381

Table 4. Net Present Value Analysis of Purchasing a Small Transplanter for $35,000 Discounted at 8% and an Income Tax Rate of 15%.

Year	Item	Outlay & Depreciation	Effect after Income Tax	Reduced Labor costs	Income tax effect (85%)	Annual Amount
0	Initial outlay	$ 35,000	$ (35,000)			$ (35,000)
1	Depreciation Tax Shield (10.71%)	$ 739	$ 111	$ 12,000	$ 10,200	$ 10,311
2	Depreciation Tax Shield (19.13%)	$ 1,320	$ 198	$ 12,000	$ 10,200	$ 10,398
3	Depreciation Tax Shield (15.03%)	$ 1,037	$ 156	$ 12,000	$ 10,200	$ 10,356
4	Depreciation Tax Shield (12.25%)	$ 845	$ 127	$ 12,000	$ 10,200	$ 10,327
5	Depreciation Tax Shield (12.25%)	$ 845	$ 127	$ 12,000	$ 10,200	$ 10,327
6	Depreciation Tax Shield (12.25%)	$ 845	$ 127	$ 12,000	$ 10,200	$ 10,327
7	Depreciation Tax Shield (12.25%)	$ 845	$ 127	$ 12,000	$ 10,200	$ 10,327
8	Depreciation Tax Shield (6.13%)	$ 423	$ 63	$ 12,000	$ 10,200	$ 10,263
9				$ 12,000	$ 10,200	$ 10,200
10				$ 12,000	$ 10,200	$ 10,200
	Net Present Value, 8%discount rate					$ 34,206

Internal Rate of Return

The internal rate of return is the rate at which the net present value of the benefits is equal to cost. Rather than use a predetermined discount rate as with the net present value method, the internal rate of return method uses the same formula as the net present value method and solves for the discount rate. You chose the investment with the highest discount rate or internal rate of return. This is a very long process to do by hand, but spreadsheet programs now have functions which allow you to solve for the discount rate. In the example we used earlier, the discount rate is 63% for the flat filler and 27% for the transplanter. Therefore the flat filler would be chosen using the internal rate of return method whereas the transplanter would be chosen using the net present value method. One problem with the internal rate of return method is that it does not take into account the size of the return. An investment with a high internal rate of return but low return in terms of dollars of profit would be chosen over an alternative with a lower internal rate of return but a higher net present value. Again, since both investments have very high Internal Rates of Return, both are good investments if funds are available.

Summary

Several tools are available to determine the profitability of alternative systems. This paper provides the process one should use in determining how to evaluate alternative systems from a financial and management prospective. However, profits may not be the only objective of the business. The manager needs to ask, "Is the system consistent with the strategic plan?" If it is not, should it be rejected, or should the strategic plan be re-evaluated? Do you have many crops, making automation less efficient than these examples? How efficient is your labor? Make sure your own analysis reflects how many flats you produce, your discount rate, tax rate, wage rate and includes any other factors that need to be considered. The investment decision will vary depending on these factors.

Enhancing Greenhouse Profitability Through Improved Cost Accounting

Robin Brumfield - Rutgers University

Every single day in the life of the greenhouse manager is filled with the monumental task of making decisions. Some of these decisions are general in nature. Is the operation profitable enough to ensure survivability for the next five or ten years or longer? Am I marketing a quality product at a price that is competitive with industry prices? Does my business have a reputation of being honest, fair, and considerate of the customer?

Other decisions tend to be more detailed in nature. What size plants should I grow? Should I invest in new machinery or technology? What price should I try to negotiate for this item? What product mix will yield the highest profit? Should I produce my own plugs, buy them from someone else, or use a conventional seeding system? How many plugs should I put in each pot?

The primary responsibility of any greenhouse manager is to make decisions that will answer these types of questions and achieve the objectives of the firm. And, of course, maximizing profits is generally one of the most important objectives of any operation. But not only are managers faced with **making** decisions that potentially impact revenues and costs of the firm, they must **implement** solutions in a manner that is both efficient and effective.

Cost accounting or budgeting is a tool that may be used to help make these decisions. In general terms, cost accounting or budgeting can be defined as a plan to allocate resources among alternative uses. That includes labor, water, capital, and any other resources that may be scarce or limited. Budgets can also be used to provide a basis for planning labor needs and for financing - deciding when to borrow and how much. They also provide a plan for when to buy supplies and when to sell your products.

Cost accounting budgets are especially effective when a record system designed for managing is already in place. Records are especially important in that they provide feedback for evaluating performance and provide information for developing and refining budgets. Thus, the effectiveness of budgeting is a function of how good your record keeping system is. Tax records are the most common type of records kept by greenhouse managers. They provide a good picture of the costs and returns of your entire business from a tax accounting standpoint. However, since most producers grow numerous crops, tax records will not provide information on the costs and returns from any individual crop that you produce. Only through cost accounting can you allocate the costs involved in operating your business to specific crops.

Though cost accounting and record-keeping are valuable managerial tools, they require time to maintain and therefore represent a cost themselves. These costs of preparing and maintaining budgets and records must be included in the total cost of the business. But if they aid the manager in making sound management decisions, then the benefits certainly outweigh any costs involved.

As an example of cost accounting, information regarding the production of geraniums from unrooted cuttings is included. These figures represent updated information originally reported by Brumfield in *Tips in Growing Zonal Geraniums*. It was assumed in this analysis that 1 cutting per 4-inch pot was used at a cost of $0.14 per cutting and the geraniums took 13 weeks to finish.

Costs are generally categorized into fixed (overhead) and variable costs because they are treated differently. Variable costs increase as the number of plants produced increases and vice versa. Fixed or overhead costs do not vary directly with production. They remain constant regardless of level of output, and are incurred even if production does not take place.

Variable Costs

Variable costs are estimated by multiplying the quantities of each input used by their input prices. Their costs can be determined easily from invoices, but may have to be allocated to the appropriate enterprise. Materials should be charged directly to each enterprise according to the amount used. It is a little more difficult to allocate the costs of labor, machinery, and equipment to any one enterprise. That is where detailed records really pay off. They greatly simplify this allocation process.

Material costs are the easiest variable costs to allocate, and include the costs of cuttings, pots, growing medium, fertilizer, and other chemicals. Costs of individual inputs will vary from producer to producer, depending on quantity discounts, method of payment, rate of fertilization, pesticide practices, and other managerial decisions. Materials costs per 4-inch geranium totaled $0.26 and are summarized below.

Production labor is slightly more difficult to allocate to each unit, but with some simple record keeping, it can be accomplished. Many of these tasks are done for one size container over a period of several hours. Simply note the number of people performing the operation and when they start and finish. Then count the number of units they finish in that time period. From this you can calculate the time per unit and multiply it by the wage rate, including benefits. This will give you the cost of that specific labor task per unit. Even though this method is not exactly precise, you will be amazed at how consistent the time per flat will be if you time the operation on several different days. So once you time an operation, you can use that time frame in your cost accounting with a good deal of confidence. Of course, you will always have some unallocated labor (trips to and from the greenhouse, breaks, etc.), which can be included in overhead costs and allocated on a per square-foot-week basis.

Production labor costs for this example were estimated using a wage rate of $6.45 per hour. This includes a base wage of $5.00 and $1.45 per hour for benefits including social security, workman's compensation, unemployment insurance, and vacation and sick days. The total amount of labor needed to produce one 4-inch geranium was 73.60 seconds (15 seconds to stick the cutting, 15.50 seconds to pot the cutting, 4.80 seconds to apply pesticides, 14.60 seconds to water and fertilize, and 23.70 seconds to harvest). Thus, the production labor charge totaled $0.13 per 4-inch geranium.

Interest on the amount of money it takes to cover materials and production labor costs must also be accounted for. First, determine the annual interest rate and divide by 52 to obtain the weekly interest rate. Next, multiply that figure by the number of weeks your money has been used from the time production costs are first incurred until the 4-inch geraniums are sold. The interest rate is assumed to be 12% for this example.

Overhead Costs

Overhead costs include depreciation, interest on fixed assets, repairs, taxes, insurance, and general categories such as managerial salaries, utilities, office expenses, professional fees, advertising and promotional expenses, and bad debts. These costs cannot be allocated to specific crops, but can be allocated on some other basis such as cost per square-foot-week. To do this, take all overhead costs and divide by the number of weeks in production to obtain an annual overhead cost per week. Next divide that number by the actual square footage of greenhouse space. Finally, divide by the percentage of greenhouse space utilized by the 4-inch geraniums to determine the bench cost per square foot-week.

Overhead costs for a typical 100,000 sq.ft. Southwestern greenhouse operation are estimated to be about $0.082 per square foot per week ($0.025 for depreciation, $0.005 for insurance, $0.006 for repairs, $0.001 for taxes, $0.024 for interest, and $0.021 for general overhead items). The overhead cost per 4-inch geranium may be calculated as follows: 13 weeks in production X $0.082/sq.ft./week X 0.25 sq.ft./plant = $0.27/plant.

Total Costs

As seen in the table below, total costs for producing a 4-inch geranium total $0.68 per plant. This is assuming an ideal situation where all the geraniums produced were saleable. Unfortunately, in reality, this is not the case. Some plants are lost to insects, diseases, or cultural problems, while others may be of such poor quality that they just cannot be sold. When losses occur, the empty bed space increases overhead costs per week, in addition to the variable costs which are lost. These types of factors must be considered when determining the true costs of production.

Uses of Cost Accounting Information

Now that we've discussed about how cost accounting budgets are developed, let's talk about how they can be used. First of all, the estimated profit of various crops can be compared to select the more profitable crops and crop combinations. You may be producing crops that are not breaking even, which is not a very competitive situation to be in.

By the way, breaking even in cost accounting terms in not necessarily a bad thing. Remember that **all** costs are being covered including opportunity costs. Positive expected profits may be viewed as a return to risk or entrepreneurial talents.

One of the most important use of cost accounting budgets is that they help establish a minimum selling price based on production costs. There are many different ways of pricing horticultural products -- some are good, and some not so good. Probably one of the most frequent pricing methods is to check what your **competitors** are charging for similar products and ask about the same price for yours. However, if you do this, you are assuming that (1) your competitors know their production costs and are pricing their products to cover these costs and (2) that your production costs are the same or less than your competitors. If either of these assumptions is incorrect, the possibility of losing money exists.

Another popular pricing strategy is to increase prices on all products a given **percentage** every year or so. This strategy assumes that any changes in costs of production affect all enterprises similarly, which is simply not true.

The best pricing strategy is the value consumers place on your product. However, cost accounting procedures can help you know the base **minimum** price you should charge for your product. The final selling price you charge ultimately depends on what you feel is the value consumers place on your product which should include a fair return on your investment and the risks associated with producing greenhouse crops. By using costs of production as a guide, you are at least guaranteeing that all of your costs are covered and you are not producing products that are not profitable.

Please keep in mind that every business faces different costs. Do not assume that your costs are the same as this example! Every greenhouse firm faces it own unique set of circumstances and, thus, its own unique set of costs. Cost vary from greenhouse to greenhouse because of differences in climatic location, size, managerial skill and style, market channel, time of year, space utilization, wage rates, age and condition of facilities, and many other factors. Comparing your costs to industry averages will reveal areas where your costs are too high or other areas where your costs are too high or other areas where your costs are low and you have a market advantage. However, looking at industry averages is no substitute for doing your own cost accounting.

Costs of producing geraniums grown in 4" pots from unrooted cuttings.		
		$ per pot
Variable costs:		
	Unrooted cutting	$0.14
	Oasis cube	$0.02
	4" plastic pot	$0.05
	Fertilizer	$0.01
	Growing media	$0.03
	Chemicals	$0.01
	Labor	$0.13
	Interest on operating capital	$0.02
	Subtotal of variable costs.....	**$0.41**
		$ per sq.ft.
		per week
Overhead costs:		
	Depreciation	$0.025
	Insurance	$0.005
	Repairs	$0.006
	Taxes	$0.001
	Interest on fixed assets	$0.024
	General overhead items	$0.021
	Subtotal of overhead costs.....	**$0.082**
	13 weeks x .25 sq.ft. per pot x	
	$0.08 per sq ft. =	**$0.27**
Total costs per 4" geranium.....		**$0.68**

Remember! These are not your costs! This example is provided only to illustrate a method of determining costs that apply to YOUR operation.

Enhancing Greenhouse Profitability Through Improved Pricing

Charlie Hall - University of Tennessee

Pricing decisions are among the most difficult marketing-related decisions for the nursery firm because prices must be high enough to cover costs and make a profit for your company, while at the same time low enough to stimulate demand and sales. In addition, the price of a product affects the positioning of your firms' products within the marketplace. For example, a high priced product (relative to the competition) has a connotation of high quality and is consistent with products which have special benefits. As you will see in this article, pricing plans require flexibility, discipline and judgment to provide for a pricing structure that is competitive, complements the product's positioning, and which maximizes sales and profits.

Ideally, your own pricing method should be based upon your operating budgets and your financial plans for the future. Setting the proper prices for your goods and services, with respect to what the market will accept, is the key to making your projected budgets and financial plans ultimately successful. However, there are almost as many pricing methods as there are companies in the nursery industry. But to say that one nursery's method or approach is superior to another is not appropriate. What is appropriate, however, is that you understand the theory and methodology of pricing for your own company as it applies to and reflects the industry.

Instead of developing or continuing to refine a price strategy based on the budgeted or planned cost of doing business, many companies devise methods that reflect what they perceive to be appropriate prices. Some of these methods are outlined below.

Many companies rely on the **judgment** of their owners and managers to determine what price to charge, rather than relying on the cost structure of the company. They believe that the opinion (and experience) of the managers and owners enables them to establish a price that is appropriate, even though the opinion may be out of touch with the reality of budgeted costs.

A price strategy known as **formula pricing** usually occurs when the management has heard of some other company using a formula for pricing. Such strategies are usually stated as "30 and 10" or "three times variable costs." With this method, the company usually marks up its costs 30 percent, usually for overhead, and then adds another 10 percent for profit. When using the latter method, the company simply determines its' total variable costs and multiplies that figure by three to arrive at the selling price. In reality, this strategy may be appropriate for the "other" company, but really has no bearing on any other company unless the cost structures of both are identical.

Another method is setting the price based on what the **market will bear**. It uses the insight and knowledge of a company's management to price the goods and services for "what they will go for." Here again is a method that lacks regard for the cost structure of the company, but perhaps it is the most aggressive method discussed here. This method takes full advantage of any opportunity to raise a price as high as possible. In contrast, a company using the judgement method may avoid inflating a price to higher than normal because of an opinion that the company should be conservative.

As mentioned previously, the ideal pricing method should be tied into and **based upon costs** as outlined in your operating budgets and your financial plans for the future. Based on budgets and cost structures, company management devises a price strategy that will recover or recoup all costs, including overhead and profit. In lieu of totally relying on market knowledge to make decisions, this method enables the management of a company to establish the price necessary to cover all costs and profit, thereby ensuring that the company can attain its financial goals.

The based on costs method is the only method addressed here that relies on the economic performance of the nursery operation as a basis of price strategy. The other methods rely on subjectivity and opinion rather than fact. Perhaps the best of all possible scenarios occurs when the pricing strategy is both market- and cost-oriented. This means you should consider what the market will bear as well as the production cost of each item. Your final price should reflect actual production costs, experience-based intuition, and knowledge of your competitors' prices. Thus, it is *imperative* to keep good records of direct production costs. These include:

- Supplies such as liners, fertilizer, soil mix, containers, and pesticides.
- Labor (including Social Security benefits and workers' compensation).
- Cost of operating machinery and equipment (including repairs, lube, etc.)
- Anything else that directly contributes to the production cost of each plant.

Total up your indirect production costs, such as insurance, interest, taxes, office supplies and equipment, and an allowance for unsold plants. Add in marketing costs, such as association dues, catalog production and mailing, related services (tagging, shipping and so on) and marketing labor. Finally, add in profit and calculate the selling price for each plant.

Calculate the price of each specie individually. Assign a given overhead cost to each plant category and divide by the number of plants you plan to sell. Because species vary in growth rate, maintenance requirements and loss factors, their production costs also vary. For instance, the cost of growing a 3-gallon azalea is different than that of growing a 3-gallon holly. Thus, the pricing structure should reflect these differences as well.

When you know the true production costs of individual species, you can eliminate unprofitable plants or raise the price enough to cover your expenses and desired profit. You also have a feel for how much a particular plant may be discounted before it becomes unprofitable to do so. If there is excess production, management has the option of setting the price so that variable costs are covered and there is adequate margin for some contribution to fixed costs or overhead. In these short run situations, if there is excess capacity it is far better to take an order with less margin, because total company profit will be greater or profit loss will be less than if the order was not taken and the sale not made. In the long run, however, prices have to be established so that all costs (fixed and variable) are covered and there is a profit.

One thing to remember is that no matter how high your production costs are for a particular plant, its price cannot exceed its market value unless the services you provide substantially differentiate your operation from your competitors. Therein lies the true opportunity for nurserymen today in pricing their products. Develop intensive partnerships with retailers and landscaping firms, establish a competitive price at which an acceptable profit can be made, and differentiate your firm through quality and value-added services.

The challenge in directly applying economic theory to the nursery industry lies in the following considerations. First, there is absolutely no nursery that has perfect information about its competitors' abilities to produce a product or at what price a competitor will sell the product in the market. The industry is highly segmented, even within the same region and market, thus forcing companies to focus on portions of the market rather than the market as a whole. This segmentation has made it virtually impossible for USDA or any private agency to maintain extensive databases on historical prices. So from an economists viewpoint, or from a managers viewpoint, this lack of industry pricing data can be quite disconcerting to any type of industry-wide price analysis.

Second, the time that is required in bringing nursery crops to market is perhaps the longest of any industry. Even if industry-wide pricing information were being collected, maintained, and disseminated at the time a crop is planted, such economic information about the market would be outdated and virtually useless by the time the product is available for sale. This phenomenon is accentuated by the fact that nurserymen must determine their product mix well before what little market information there is becomes available.

Lack of standardization further compounds the industry's pricing problem. A 1-gallon azalea from one nursery is often quite different from a 1-gallon azalea from another nursery. Unfortunately, unlike other agricultural industries, the nursery industry has few intermediaries to price and market its products, particularly when it comes to plants that are ultimately sold in garden centers. The number of brokers and middlemen in the distribution system are incredibly few as compared to the number of suppliers and consumers. And because of the variability of the product and the subjectivity of people when grading and setting quality standards, there are no financial intermediaries. There is no such thing as "Crapemyrtle futures" that are traded or listed on any commodity exchange like other agricultural crops are.

Combine all of these factors and one soon realizes that owners and managers of nurseries within this highly diversified industry have a difficult task indeed in setting prices that are realistic and appropriate to the cost structure of their operations. That is why a management system that uses the internal information of the past tempered with a realistic budget of the future and a price strategy that coincides with that budget is the only method that will ensure success. Adhering to the following list of "do's" and "don'ts" will be a step in that direction.

Do:

- **!** Review your pricing problems and opportunities and your marketing strategies before developing your pricing plan .
- **!** Closely monitor the competition and keep consistent records of your competitions' pricing.
- **!** Be flexible. Be prepared to adjust to competitive pressures and the marketing environment.
- **!** Be willing to change your price and use it as a tool for achieving marketing strategies.
- **!** Use the pricing tool to communicate the positioning of your product.
- **!** Test your price often. Test higher and lower prices and monitor the response in test markets. Apply what you learn to your total system. However, make sure you test your pricing strategies for a long enough period to obtain realistic results.
- **!** Remember, the more intangible services offered or unique your product, the more flexibility you will have in setting higher prices.
- **!** Price your product to provide ultimate value to consumers. Remember, you can still give real value through high price (i.e. the product is a little higher priced than the competition, but the customer receives a unique or better service).
- **!** Be aware of not only the obvious costs, but also the hidden costs when determining your price (i.e. empty bench space, death losses, shrinkage through employee theft, etc).

Do NOT:

- **!** Look at pricing as static. Your cost of doing business and the competitive activity in your marketplace is not fixed. Your pricing shouldn't be either.
- **!** Set pricing without first determining how it will affect sales, margins, and the ability of the company to cover variable and fixed costs.
- **!** Be afraid to use price to achieve other marketing goals, such as inducing trial. Successful companies often plan for a period of lower prices in an effort to increase trial and build the customer base. Though profitability is reduced temporarily, it is often offset by a sustained period of repeat purchase at full price by the expanded customer base. However, it is a good idea to test this premise to make sure you are receiving adequate repurchase from the new customers to justify a rollout of the program.
- **!** Confuse potential purchasers with constantly changing prices, but try to remain flexible.
- **!** Over-react to the competition. Before you change your long-run pricing strategy, wait to see if the competitive price changes are temporary or permanent. At the same time, learn to anticipate and react to short-run competitive price changes.
- **!** Lower an already competitive price if you are attempting to build an image based on quality or value. Instead, put greater emphasis on the quality of your product.

Enhancing Greenhouse Profitability Through Improved Financial Analysis

P.J. van Blokland, - University of Florida

The objective of this paper is to present a description of the financial tools needed by a greenhouse owner who must make sensible financial decisions about his firm. Each tool is outlined sufficiently for the reader to follow the major points in using the tool but will require some further study and practice to use it properly.

INTRODUCTION

Times have changed. Good production practices once earned good farm income. This is no longer the case today. Agricultural firms need to make good marketing and financing decisions as well. It is not enough to do the job right. It is much more important to do the right job and this requires modern management methods. This paper assumes that the manager and owner of the firm are the same individual.

Management in any job consists of using information to make decisions to help the firm meet its objectives. Consequently, the manager needs to know what its objectives are. Objectives need to be written down and quantified in terms of numbers and time. "Make a profit" is not an objective. "Make $100,000 net income by the end of December three years hence" is. And in setting objectives the manager must realize where the firm stands today and how it got there. Therefore a lot of good management consists of linking the past with the future by making sound decisions today. This paper will present some of the main financial tools that do this linking. These tools are outlined in Figure 1.

This diagram presents the essential financial tools for any firm. These tools provide the information necessary to make the most of the production, marketing and financing decisions in the firm. The diagram starts with the information that the manager thinks he needs. This information is digested and used to state the firm's objectives. The diagram then separates into two parts. The left hand side, or the recording section, shows what has happened to the firm over time. These events were recorded and analyzed to write the objectives of the firm. The right hand side, or the management section, shows what might happen to the firm if it meets its current and future objectives. The left and right hand sides are linked by monitoring. In other words, by comparing what actually happened with what the manager thought would happen. He must make decisions on any differences between the two. There will, of course, always be a difference for no one is clairvoyant. The real job is to make the right decision on the difference.

For instance, suppose that the manager thought, based on historical performance, that his second quarter greenhouse cash sales margin over cash costs would be $400,000, and the margin actually was $300,000. He is $100,000 short and probably has committed that $100,000 to future uses. He may have lined up resources for that purpose and now has bills to pay. He has to find out why there was a cash margin difference of 25% and what he should do about it (doing nothing is still a decision). This is not easy, but it is real management. These tools will help in this decision making process and, if necessary, help modify future objectives.

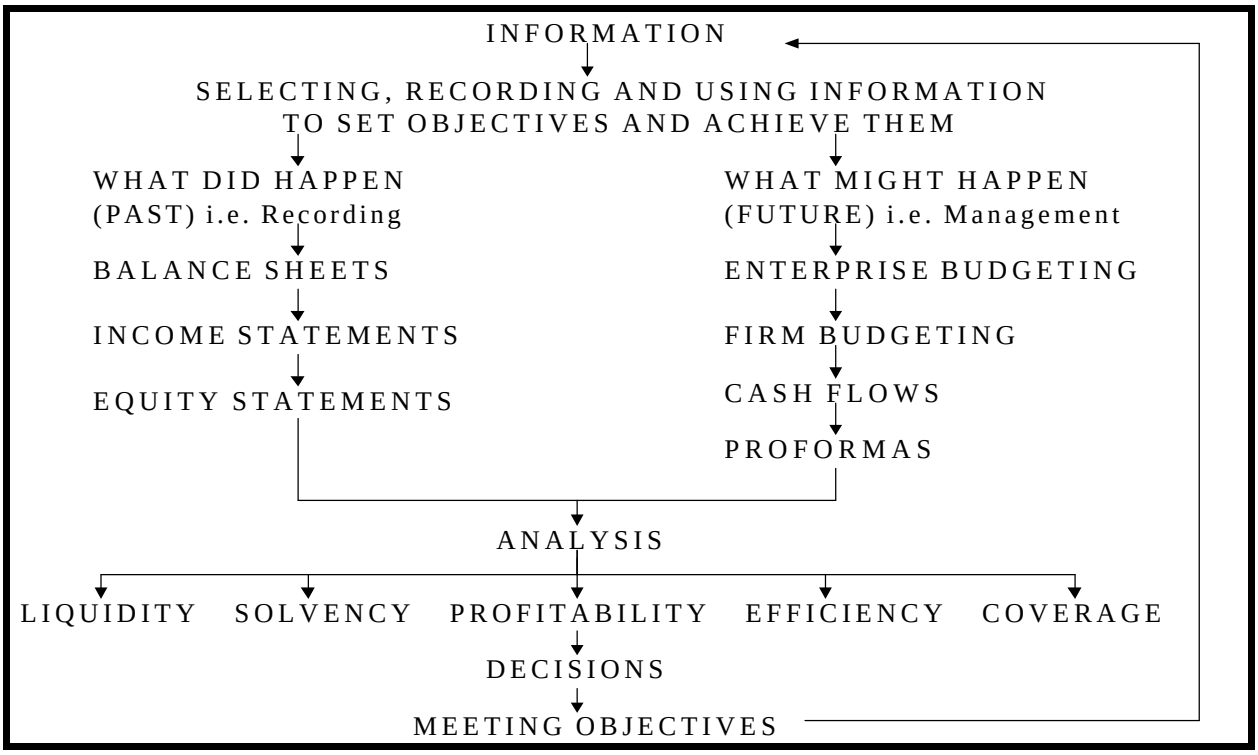

Figure 1. The essential financial tools of a firm.

THE BALANCE SHEET

The balance sheet presents a picture of the firm at one point in time. This is an important point to digest. Because the balance sheet is a snapshot of the firm on that day, the firm's owners, correctly and legally, make this statement look as good as they can in order to impress their readers. People dress well when they are interviewed or inspected. Firm owners do the same thing when they produce their balance sheet.

The balance sheet shows three things. These are assets, liabilities and equity. Assets are what the firm has, and these possessions are usually divided into three categories in agriculture. Current assets are assets that can be or soon will be turned into cash. They include items like inventory for sale, supply inventory, cash, cash equivalents (e.g. savings accounts, stocks, bonds, mutual funds) and receivables. Intermediate assets usually consist of vehicles, equipment, machinery, and non permanent buildings and structures. Long term assets are permanent buildings and land.

Liabilities are what the firm owes. These also have three categories. Short term liabilities are what the firm owes in the period between now and the next balance sheet. These would be the quarterly bills for a firm reporting quarterly or annually for firms with a yearly set of accounts. Current liabilities include the principal and interest on operating loans, payables and the current principal and interest portion of intermediate and long term debt., i.e., what the firm owes in the next period on its notes and mortgages. Intermediate liabilities are what the firm owes on notes after deducting the current portion. Likewise, long term liabilities are the remaining mortgages owed after meeting the current portion.

Equity is what the firm owns. It is calculated by subtracting all the liabilities from the firm's assets. Consequently, it is a residual and has to be found by subtraction. For example, if the assets are

$2.5 million and liabilities are $1.5 million, the firm's equity is $1 million. Equity is a key number for managerial scrutiny. Managers want to see steady equity growth, period after period. Equity is also used in various ratios to see how the firm handles debt. For example, the leverage ratio is defined as total debt divided by equity. In the above instance, the ratio is $1.5 million divided by $1 million, or 1.5. This means that the firm owns $1 for every $1.5 of debt. If the ratio increases, there is more debt owed per dollar owned and its risk has increased. If the ratio falls, the firm has reduced its risk.

Thus the balance sheet can be used to compare how any or all of the assets and liabilities have changed from one period to the next, and the effect of these changes on the firm's equity. Good managers will make firm structural decisions from the balance sheet information. The balance sheet is illustrated in Figure 2.

ASSETS	**LIABILITIES + EQUITY**
Current	Current
cash + cash equivalents	payables
sale inventory	operating loans
supply inventory	current portion of notes
other inventory	current portion of mortgages
receivables	other loans
Intermediate	Intermediate
vehicles	vehicle notes
equipment	equipment notes
temporary buildings	building notes
Long term	Long term
permanent buildings	building mortgages
land	land mortgages
	Equity
TOTAL ASSETS	TOTAL LIABILITIES + EQUITY (net worth)

Figure 2. A Simple Balance Sheet.

THE INCOME STATEMENT

The income statement shows how the firm performed in the period between the two balance sheets, during the quarter or during the year. The income statement shows three things: outputs, costs and incomes. It is perhaps the most important statement to analyze in a firm. It shows how the manager used resources and what he got from their use. Therefore income statement analysis can often separate good from other managers.

The first item on the income statement is gross output. Gross output is what the firm produced. It includes sales, change in supply and for sale inventory from one balance sheet to the next, other firm income and change in receivables. Gross output should increase over time and the proportion of sales making up gross output should be consistently high. This is because gross output can increase in one period with inventory sales, but this inventory must be replaced later on.

Costs are divided into three categories. The most important are cash costs which are at least 70% of an agricultural firm's expenses. Cash costs are items paid with cash. They include supplies, labor, interest, fuel, repairs and marketing expenses. Cash costs are divided into four or five major categories for analysis (chemicals and fertilizers; labor, social security and associated taxes and

expenses; marketing expenses; interest). These categories are not standard, but are left up to the individual firms. The concept is to account for 80% of cash costs in these categories and to follow what happens to each category.

Gross output minus cash costs equals gross margin. Gross margin shows whether the firm can cover its cash costs and, if it can, how much is left to cover the rest of its commitments. Gross margin is an exceedingly useful concept which can be used for enterprises and the whole firm. Again, it is important to follow the gross margin of the different enterprises and use this information to make changes in enterprise operation.

The second major cost is depreciation. This cost is the annual rate allowed by the IRS to write off depreciable capital assets. Depreciation is a real cost though it is not paid by the firm until it replaces its capital assets. Capital assets that can be depreciated include orchards, machinery, vehicles and buildings. Until these assets are replaced, the depreciation allowances by the IRS add cash to the firm. This additional cash is most easily seen in the cash flow.

The third cost category is overhead. This category is usually disregarded by firms or used as a catch all for miscellaneous items. All overhead items can be put in cash or depreciation costs. But because overhead is relatively unproductive compared with the other two costs, overhead should be recorded separately. Overhead items include office expenses, business education and publications, lawyer and accountant fees, business travel and client entertainment. There is a tendency for firms with good years to expand their travel and entertainment overhead when that money might be better spent on cash cost items; therefore, it is advisable to track the cost shares of the three types of costs over time to see where firm expenditures go. Rules of thumb are usually incorrect, but a typical nursery firm might have 75% of its costs as cash, 18% as depreciation and the remaining 7% as overhead. Any marked deviation from the firm's historical trends needs investigation and some good explanation.

Cash plus depreciation plus overhead cost equals total costs. Gross output minus total costs equals net firm income. A positive net firm income shows the firm has covered all its costs, but net firm income is not profit. The firm still has other commitments. Net firm income is essentially equivalent to taxable income for a non corporation because property taxes, road taxes and other firm taxes are cash costs. A high net firm income means higher taxes which might encourage the manager to purchase some needed depreciable capital asset. Depreciation reduces the net firm income and the tax bill.

Net firm income minus owners' income and social security taxes provides net income. This is the bottom line of any firm. To see how a firm is doing, follow its net income over time. A firm's net income can only be used for three things: the owners' salaries, re-investing in the firm and principal payments. Owners' salaries is what the owners withdraw from the firm for living expenses including vacations, purchases for private items, education, etc. Owners' salaries is the equivalent of dividends. Any capital purchases must come from net income. Principal payments are settled with the firm's net income. Interest on principal is a cash cost. The corporate equivalent of principal plus investments is called retained earnings. Figure 3 illustrates an income statement.

GROSS OUTPUT
- sales
- other income to firm
- change in supply inventory
- change in sales inventory
- change in receivables
- TOTAL

CASH COSTS
- category 1 (e.g. chemicals and fertilizers)
- category 2 (e.g. all hired labor expenses)
- category 3 (e.g. transportation, fuel, repairs)
- category 4 (e.g. all marketing expenses)
- category 5 (e.g. all other cash costs)
- TOTAL

GROSS OUTPUT - CASH COSTS = GROSS MARGIN

DEPRECIATION
- vehicles
- machinery and equipment
- buildings
- all other depreciable assets
- TOTAL

OVERHEAD
- office expenses
- salaries and fees
- business travel/entertainment
- all other overhead
- TOTAL

TOTAL COSTS
- cash
- depreciation
- overhead

TOTAL GROSS OUTPUT - TOTAL COSTS = NET FIRM INCOME

OWNERS' TAXES
- income taxes
- social security taxes
- other taxes
- TOTAL

NET FIRM INCOME - OWNERS' TAXES = NET INCOME

NET INCOME
- principal payments
- re-investing
- owners' salaries

Figure 3. A sample income statement format.

The income statement shows the money coming into the firm and where the money goes in the firm in the period between the two balance sheets. Understand that the cost framework in the statement can be adapted by any firm to suit its specific needs. The items listed under each cost are examples only. Realize also that the net income shows how the money after total costs and owners' taxes was spent. It is not a residual nor is there anything left after its three uses. Put another way, net income minus investing in the firm and principal payments equals what the owners withdrew as salary.

Good analysis of this statement will include trends in gross output, costs and incomes and the changes in the components of each that caused these trends. Decisions will be made on these changes and objectives re-written as cause and effect are determined.

THE STATEMENT OF OWNER EQUITY

This statement links the beginning and ending balance sheets with the income statement to show how owner equity has changed over time. Figure 4 shows the linkages for a quarterly set of statements. Owner equity is a key number to monitor. It shows how much of the firm is owned by the owners who hope to see continuing equity growth over time. Equity growth probably ranks second to net income as the most important firm indicator of success.

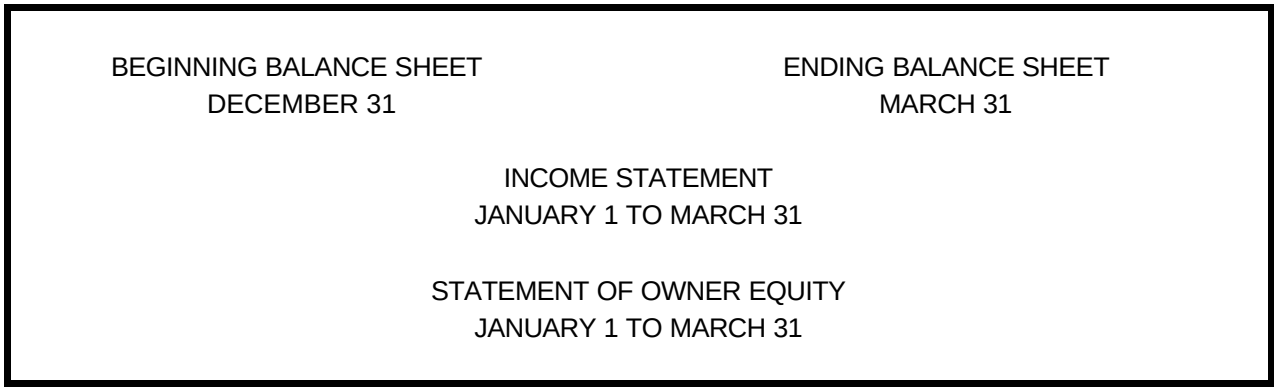

Figure 4. Format of a statement of owner equity.

This statement has three useful pieces of information. It shows firstly how equity is increased by paying off principal and investing in the firm (adding retained earnings in accounting language). Secondly, how equity is depleted by taking salary from the firm. Thirdly, how inflation and deflation affects equity as asset values change.

The statement starts with the equity recorded in the beginning balance sheet on December 31st. Say this is $500,000. The net income from the income statement for the next quarter is added to this equity. With a net income of $50,000, equity increases to $550,000. Subtract owners' salaries of $20,000, and the revised equity is now $530,000. So the first function of the statement listed in the paragraph above shows that equity increased in the firm by $30,000 which came from paying off principal and re-investing. (Note that the $50,000 net income went on $20,000 salary and $30,000 principal and investing).

The second function is how equity is depleted by drawing salary. This withdrawal of $20,000 reduced equity by that amount. Obviously, the more the owners withdraw the less the equity growth will be. This may seem trite but it is an important point. Owners have to have enough to live on and to enjoy themselves. Only they can decide whether the increased enjoyment is worth the reduction of equity growth. This statement shows the relative effects clearly. Some 40% of the quarter's net income went on salary, so the remaining 60% was available to increase equity.

The third function shows changes in asset valuation due to external factors. These externals are usually combined under the rubric of inflation. It is possible for a firm's equity growth to be entirely due to inflation. If, for example, land prices double, the firm's real estate is worth twice as much as it was before and equity growth is correspondingly impressive. And as inflation decreases and equity growth correspondingly falls, the firm does not look so good. This artificial type of equity growth must be realized to avoid bad decisions. In order to work out asset valuation changes correctly, the manager needs a balance sheet recording both book and market value valuations of assets.

Book value can be measured in three ways, depending on the type of asset. One measure is what the owner has invested in the items. This measure will apply to most of the firm's inventory items. For example, valuing a 10-inch pot plant at $4.50 because this is the sum of the cash, depreciation and overhead costs and the management that went in it. A second way to measure book value is to use what the item cost the firm. This measurement is often used for non depreciable assets. For example, $3,500 for an additional acre of land or $10 for a plant that the nursery will subsequently add value to. The third way to measure book value is to use the current depreciated value of the asset. For example, a three year old tractor that has a depreciated value of $50,000 is simply valued at that amount.

The market value of an asset is what the firm could get for that asset if it were sold soon. Market value is mostly greater than book value. Current assets are usually valued at either what has been invested in them (book) or what they could be sold for in the market place. Suppose the book value of these assets are $90,000 and the market value is $120,000. There is a difference between the two of $30,000. Suppose that the book value of the intermediate assets were $150,000 and their market value were $200,000, for a difference of $50,000. Likewise the book of the long term assets is $400,000 and the market value is $600,000, with a difference of $200,000.

This last sentence needs elaboration. Land assets dominate the total assets of agriculture even in nursery firms. Land cannot be depreciated, so the book value of the land is either the original purchase price, or if it was purchased generations ago, the latest assessment of the value of the land. The market value is what the land can fetch in today's market. It is usually land values that signal inflation in agricultural markets.

So the book value of all the firm's assets are $90,000 + $150,000 + $400,000 = $640,000. The market value of its assets are $120,000 + $200,000 + $600,000 = $920,000. The difference between the two is $280,000. Taxes will be due on the differences in the non current assets if they are sold. With a tax bracket of 20%, the tax due is [($600,000 + $200,000) - ($150,000 + $400,000) x 0.20)] = $50,000.

Assume that all these asset values are shown in the beginning balance sheet. If liabilities are $140,000, then the cost or book equity is $640,000 - $140,000 = $500,000. The book equity is the equity earned by the firm up to that point in time. The market value equity is $920,000 - $140,000 = $780,000. This equity is what the owners would get if they sold all their assets and met all their pretax liabilities. Therefore the gain in equity from the value difference alone is $670,000 - $390,000 = $280,000. Subtract the tax of $50,000 that would be due from selling these assets, = $230,000. This $230,000 is what is called the valuation equity or the amount that equity has increased solely due to increases in the value of the firm's assets.

Assume also that the ending balance sheet records a valuation equity of $260,000. So the gain in the quarter from changes in asset valuation only is $260,000 - $230,000 = $30,000. The three functions of the statement of owner equity are summarized in Figure 5.

		BOOK	MARKET
Owner equity in beginning balance sheet		500,000	780,000
1. Net income during the quarter	plus	50,000	50,000
2. Salary taken during quarter	minus	(20,000)	(20,000)
3. Change in valuation equity			
ending balance sheet	+$260,000		
beginning balance sheet	- $230,000		
total change	plus		30,000
Owner equity in ending balance sheet		530,000	840,000
Change in owner equity	plus	30,000	60,000

Figure 5. Summary of statement of owner equity.

The firm's equity increased $30,000 during the quarter from the firm's production. But it also increased $60,000 from changes in the valuation of the firm's assets. The former shows the results of the manager's work and the latter shows the external factors, driven largely by inflation. Owners can use either or both numbers as they like. The important thing is to know the difference between the two and what the causes of these differences were.

ANALYTICAL TOOLS

The historic performance of the firm has been presented in balance sheets, income statements and the statement of owner equity. These statements must now be analyzed.
There are five basic toolboxes used in analysis. Each box contains several different tools. These toolboxes are: 1. the liquidity toolbox, 2. the solvency toolbox, 3. the profitability toolbox, 4. the efficiency toolbox and 5. the repayment capacity toolbox.

LIQUIDITY

This toolbox provides the tools necessary to see how liquid the business is. In other words, how difficult is it to raise cash? The definition of liquidity is the ability to meet liabilities when they become due. The due liabilities are the current liabilities listed in the balance sheet. The cash to pay them comes from the current assets listed in the same balance sheet. There must be enough of these, as cash, to pay current liabilities. If there are, the firm is liquid. If there is not, the firm is illiquid. Today all firms must stay liquid. Cash is the most important asset there is today. Good managers spend a lot of time making certain that their firms are safely liquid.

Working Capital

Working capital is one of the major tools in the liquidity toolbox. It is calculated by subtracting current liabilities from current assets. For example, if the firm's current assets are $80,000 and current liabilities are $50,000, there is $30,000 working capital. In other words, after paying all the due debts, there is $30,000 left. The firm is liquid and that is good news.

Quick Working Capital.

Some current assets may not be quite as liquid as others. For instance, growing crops are not as easy to sell, i.e., not as liquid, as crops waiting to go to market. And nothing is as liquid as cash. This is the meaning of liquidity. Quick working capital is a tool that takes the "stickiness" of some of the current assets into account, to give a more realistic picture of what cash is actually available. Only current assets which can be sold quickly without a discount are included. Items include cash, savings, investments in stocks, bonds and mutual funds, receivables that can be realistically realized quickly and any inventory that is at or close to the point of sale. There will be times when the working capital of a firm looks substantial, but the quick working capital is negative. In other words, the firm is not as liquid as it originally looked.

Current Ratio

The current ratio tool is calculated by dividing current assets by current liabilities. Thus if the current ratio of a firm at a specific point in time is 1.25 to 1, this means there is $1.25 to cover every $1 of debt due. Most firms will find it safe to keep their current ratio between 2 and 3, meaning that they have $2 to $3 available to cover current liabilities. If the ratio falls below 2, the manager should make sure that he can get liquid when he needs to. And if the ratio rises above 3, he then has cash available for investing.

Current Debt Ratio

This is the final tool in the liquidity toolbox. The current debt ratio is found by dividing current liabilities by total liabilities. It shows what proportion of all the firm's debt, both principal and interest, is due in the next period. For example, if current liabilities are $35,000 and total debt is $150,000, the C.D.R. = 35,000/150,000 = 0.23. This means that 23 cents of every dollar owed is due in the following period. Obviously it is hard to generalize about any correct ratio, because it depends completely on the firm's debt load. But for a typical firm with a normal debt load, it is probably useful to keep the annual ratio below 0.1. A C.D.R. of 0.1 means that the firm must pay some 10% of its debt annually, so that its current debt level would be cleared in 10 years. Most firms will find this a difficult objective to achieve.

SOLVENCY

Solvency is a long run concept. It shows whether the firm can meet all its debts if it sells all its assets. If the assets are greater than the liabilities, the firm is solvent. If they are not, the firm is insolvent or bankrupt.

Equity

This is the single best measurement of solvency. If the firm has equity, it is solvent. Perhaps the most useful indicator of a firm's progress is a good equity trend.

Leverage Ratio

The leverage ratio is calculated by dividing total debt by equity. For example, if the firm's total debts are $200,000 and equity is $100,000, the leverage ratio is 200,000/100,000 or 2. In other words, the firm has $2 in debt for every $1 that it owns. Most firms will find it preferable to keep this ratio to a maximum of 1. However, it obviously depends on the situation the firm is in and the objectives and ages of the owners. Usually young owners will have higher leverage ratios than old owners. A high leverage ratio is nothing to be ashamed of. It's something to get out of.

PROFITABILITY

Profitability is a word that everyone recognizes but few people define. The most obvious common sense measures of profitability are the incomes that were outlined in the section on the income statement, namely net firm income and net income. Recall that net income is the bottom line for the firm.

Return on Equity or ROE

This is perhaps the most important trend to look for after net income. It shows the return on owned money in the business. It is calculated using the formula:
(Net income minus owners' salaries / beginning equity) x 100

For example, suppose the firm's net income for the quarter was $40,000. The owners withdrew $16,000 for salary and the equity at the start of the quarter was $300,000. The firm's ROE is therefore (40,000 - 16,000) x 100 / 300,000 = 8%

Return on Assets or ROA

This tool is calculated using the formula:
(Net firm income + interest paid - owners' salary) x 100 / beginning assets).

The interest paid on debts is added back because the firm borrowed money to buy assets and is paying interest as a cost of borrowing. Consequently, the interest represents the return from that asset using the borrowed money. Thus part of the asset is financed with debt and part with equity and the manager wants to know what the total return on that asset is. Hence the interest must be added back to calculate the total return. Hopefully it will be greater than the cost of borrowing. It is not sensible to borrow at 10% if the investment is returning 6%. This will happen if ROE is less than ROA. The firm is earning less than it is paying to borrow funds.

For example, suppose the firm had a net firm income of $50,000 during the quarter, paid interest of $10,000 and withdrew salary of $16,000. The assets at the beginning of the quarter were $600,000 . The ROA is therefore

(50,000 +10,000 - 16,000) x 100 / (600,000) = 7.33%

EFFICIENCY

This is perhaps the most familiar toolbox to agriculturalists. Most efficiency tools refer to the relationship between inputs and outputs. Examples include yields per acre, hours of labor per square foot, cash cost expenses per square foot, sales per week, boxes picked per hour of labor, etc. These or their equivalents are often kept by each firm and will not be presented here, except to emphasize their importance.

Operation Ratios

This tool is particularly useful in examining how costs change over time. It uses percentage ratios that always add up to 100%. The components are: (1) cash costs excluding interest; (2) depreciation; (3) interest; (4) owners' taxes and social security; (5) other costs not already counted; and (6) net income. All these components come from the income statement. Adding the six components together gives the firm's gross output. For example, see the following quarterly income statement in Figure 6.

COMPONENTS	**$**	**%**
cash costs, excl. interest	70,000	58
depreciation	10,000	9
interest	12,000	10
taxes and S.S.	4,000	3
overhead	4,000	3
net income*	20,000	17
GROSS OUTPUT	120,000	100

* This is the residual from subtracting all the costs from the gross output.

Figure 6. A quarterly income statement.

The interpretation is that 17% of the firm's gross output results in net income, 58% goes on cash costs excluding interest, 10% on interest and so on. Put another way, for every dollar that the firm generated in that quarter, 17 cents was net income, 58 cents went on cash costs excluding interest, etc. The most useful thing about this tool is spotting trends. If, for example, interest costs took an increasing share of each gross output dollar, the manager has some decisions to make.

Asset Turnover

Firms, and nursery firms in particular, have to know how quickly they turn their assets over. The classic definition for asset turnover is Gross Output / Average Total Assets. It shows how assets are used to generate output. The greater the ratio, the better the assets are used. For example, if the firm produces $1,000,000 gross output in a year and its average asset valuation was $5 million, the turnover ratio is 20%. One fifth of its assets turn over annually. But because of the almost unique asset fixity in agriculture (i.e., the land domination of assets) even in the nursery business, perhaps another denominator is more useful. For those firms who have more than 30% of their total asset values in land, remove land from the denominator and work with the remaining assets. Then compare the turnovers with and without land.

Labor Productivity

This is a particularly important ratio for nursery firms. It can be calculated by dividing the firm's gross output by the labor cost of the firm. For some firms it might be interesting to include the owners' salaries in the denominator as well.

REPAYMENT CAPACITY

There are three main repayment capacity measurements and they all focus on how the firm can pay its debts. Note that these three measures all assume that operating debt will be repaid as the output is sold. So unless any operating debt is carried over from the previous period, all operating debt, both principal and interest, is excluded from the formulae.

Coverage Ratio

This is found by the following formula:

$$\frac{\text{net income + depreciation + interest - owners' salaries and taxes}}{\text{annual principal and interest payments}}$$

The higher the ratio, the easier it is for the firm to meet its debt commitments. If the ratio is 1, it can just meet them. It also means that the firm is living, to some extent, off depreciation to service the debt. In other words, the firm cannot replace any of the capital depreciation with new purchases. Anything greater than 1 gives the firm room to do other things.

Capital and Debt Margin

This ratio is essentially the next step up from the coverage ratio. It shows whether the firm can both meet its debt and afford to replace the capital assets lost in producing its net income. The capital and debt margin =

$$\text{net income + depreciation - owners' salaries and taxes - principal payments}$$

Debt to Income Ratio

It is calculated as follows: average total liabilities / net firm income

The average total liabilities is calculated from adding the liabilities of the beginning and ending balance sheets together and dividing by two. The ratio shows the number of times that the firm's debt

exceeds its net firm income. For example, if liabilities are $300,000 and the net firm income is $50,000, the ratio is 6. This means that, at the current rate, it would take six years for the income to equal debt. If the ratio falls to 5, then its income leverage is reduced and the firm has reduced its risk. If the ratio rises, then income leverage is increasing; increasing the firm's risk because it becomes increasingly difficult to service this debt from current income.

SUMMARY OF WHAT DID HAPPEN

Managers, by necessity, use past performance to see how the firm is doing. This synopsis, using balance sheets, income statements and statements of owner equity provides the raw data for the five analytical tools of liquidity, solvency, profitability, efficiency and repayment capacity. The manager is expected to produce answers from this analysis that will show whether the firm is meeting its objectives and to help formulate new objectives. But, unfortunately, analysis is neither entirely scientific nor precise. Analyzing the financial heath of a firm involves art or intelligent guesswork in much the same way that a doctor assesses and makes conclusions on the physical health of a patient.

Perhaps the most important part of this assessment is to estimate what the firm or the patient will look like in the future. It is this estimate that produces the objectives of the firm by bringing past performance and future predictions together. Analysis of past performance and knowledge of the present situation formulates what the firm can do in the future. These future predictions use the tools on the right hand side of Figure 1, and will be presented now.

BUDGETING

Budgeting is trying to plan future expenditures and match these in some way with future sales and other dollar inflows. It is probably the single most important function in running a firm. No one knows the future so budgeting results will usually be wrong. But it is essential to try. A budget is a map for the future of the firm and no one should go on a journey into the unknown without a map. And as with a journey, budgeting estimates change as circumstances change. The procedure is to start with budgeting the firm's individual enterprises. These enterprises are then added together to make the firm's budget. The firm's budget is then used to produce the cash flow for the firm.

ENTERPRISE BUDGET

A generalized enterprise budget is shown in Figure 7. Realize that the blanks under each category are where the individual items making up that category are entered. For example, the items of fertilizer, chemicals, labor, etc. would go under cash costs. Realize also that the sums of the different categories are shown by a capital letter.

Anticipated sales and costs of producing one (UNIT) of enterprise(NAME) in (WHERE) in (YEAR)

			$ per UNIT
SALES			
	Anticipated (yield____) x anticipated (price___)	=	A
COSTS AND INDICATORS			
	(1) Cash costs _____		
	_____		
	Total cash costs	=	B
	GROSS MARGIN (A) - (B)	**=**	**C**
	(2) Depreciation _____		
	_____		
	Total depreciation	=	D
	(3) Overhead(prorated)	=	E
	TOTAL COSTS (B) + (D) + (E)	**=**	**F**
	NET FIRM INCOME (A) - (F)	**=**	**G**
	(4) Owners' estimated taxes and SS	=	H
	NET INCOME (G) - (H)	**=**	**I**
	MINUS		
	1. salary to owners	=	J
	2. principal payments	=	K
	EQUALS		
	amount left for buying assets	=	L
	i.e (I) - (J +K)		

Figure 7. A general enterprise budget.

Note that sales have proxied for gross output. If it is possible to budget the gross output of the enterprise, it should be done. But budgeting is difficult enough anyway and as sales are usually easier to estimate, they are a good proxy for gross output. The enterprise budget figure shows that each enterprise has to play its part in meeting all the firm's outlays. These outlays include not only the cash, depreciation and overhead costs, but also owners' taxes, salaries, principal payments and funds for re-investing in the firm. Therefore, if “L” is positive, the firm has a good enterprise to consider. If it is not, the firm should produce something else. Obviously, there is a limited choice for any firm. But the main point is that no enterprise should be produced in the long run if it cannot pay all the freight that is presented in Figure 7.

Assume that the enterprise can generate a positive "L." This is a necessary but not a sufficient reason for the manger to produce it. There are at least four questions that must be answered before the enterprise is produced: 1. Are there enough resources available to produce it (sufficient land, labor, debt and equity capital and managerial ability)? 2. Is there a market for this enterprise and what must the firm do to get the enterprise to that market? 3. What must be done to the enterprise before it is marketable (how must it be prepared, graded, packaged, transported, etc.)? 4. What are the production, financing and marketing risks involved (yield; cost and price volatility; capital availability and the effects of weather, pests, diseases, breakdowns, strikes)?If the answers look good, then repeat the process with other possible enterprises, select the ones that look the most profitable and combine these enterprises into a firm budget.

COMBINING SELECTED ENTERPRISES TO MAKE A FIRM BUDGET

The procedure is to list the enterprises in a table, complete the row names in the table, calculate the net firm incomes from each enterprise and add across the table to produce the firm budget. A reasonable layout for this exercise is shown in Figure 8 which also includes the projected numbers for the five enterprises and a total.

	ENTERPRISE BUDGETS					FIRM BUDGET
CATEGORIES	**1**	**2**	**3**	**4**	**5**	**TOTAL**
SALES	250	200	150	100	100	800
Cash costs	150	120	80	60	60	470
Depreciation	36	29	22	14	14	115
Overhead	14	11	8	6	6	45
TOTAL COSTS	200	160	110	80	80	630
NET FIRM INCOME	50	40	40	20	20	170
tax + social sec	10	8	8	4	4	34
NET INCOME	40	32	32	16	16	136

Figure 8. Methodology for developing enterprise and firm budgets.

This shows each enterprise's contribution to the firm and how each contribution is shared among the outlays. Based on these figures, the owner would expect the firm to have $800,000 sales, $470,000 cash costs, $115,000 capital assets as depreciation, $45,000 overhead, $34,000 income and social security taxes and $136,000 net income to allocate for salaries, principal and re-investment in the firm. Because firms vary considerably in net income allocations, allocations are not shown here. Given a salary of $50,000, there is approximately $86,000 remaining for principal and investing. Note that re-investing will reduce income taxes if depreciable assets are purchased.
The budget estimates come from experience, records and current events. There are, however, some simple guidelines for these estimates. On many nursery firms, cash costs are typically 75% to 80% of total costs. Likewise, depreciation is about 15-20% and overhead is what is left. Net income is often about 15% of gross sales. These are guidelines only, but are useful for budgeting purposes. If events change, then the budget must be changed to reflect these changes. Estimates are always hard to do and they are usually wrong. But they are the best tool available for the future and obviously become more accurate as the future gets closer to the present.

The most important asset today is cash. Managers need to know when they will need cash and when it comes into the firm. The next step therefore is to produce a cash flow.

THE FIRM CASH FLOW

Cash flow is a planning tool stemming from the firm's budget and is the final planning tool before resources are allocated to produce the firm's enterprises. The cash flow plans the future inflows and outflows of cash in the firm over a specific time period. It also shows cash in the business at the beginning and ending of a period.

Examples of cash coming in include sales, new borrowing, other firm income and new equity. Examples of cash leaving the business include cash costs, principal payments, owners' salaries, asset purchases and owners' income taxes and social security.

The cash flow does three things, although it is usually only used for one of them. It predicts the future which is what most managers use it for. More important, it monitors predictions by comparing the original estimates with what actually happened. Finally, it helps managers make decisions on the difference between predicted and actual results.

For example, suppose that at the beginning of the year August sales were predicted to be $60,000, but at the end of August the actual sales were $40,000 or 33% less than the estimate. What decision should the manager make? Adjust subsequent sales to reflect the difference? Do nothing? The answer, of course, depends on why sales were down. If it was because the market price fell or yields or quality was down, then some future adjustments will be necessary. But if the plants were not quite ready for sale, then perhaps only September's numbers should be adjusted.

If cash is unavailable when it is expected, there is more than sales to consider. Cash outflows were originally matched to inflows. If inflows fall, cash commitments cannot be met. Commitments include debt service, payables and salaries. Consequently, other cash sources must be tapped to meet commitments. A properly used cash flow shows what is happening and suggests what the consequences will be when predictions must be changed. Cash flow is constantly changing and provides the manager the cash map necessary for cash management.

Cash flow forms vary and no one basic form fits every firm, unlike the balance sheet and the income statement. It is more important to have a good cash flow system than worry about form uniformity. The system should run for three years, with the nearby year having all details in possibly 100 row names and the last year with only a few major summaries in perhaps 10 row names. The nearby year uses monthly columns, always keeping 12 months ahead. Thus as one month expires, the same month in the following year comes in. The second cash flow is done quarterly so that there are five main columns (four quarters and a total) and maybe 20 row names. The final cash flow is an annual flow with just one column and perhaps 10 rows. The row reduction is for two reasons. Firstly, it is unreasonable to expect to predict the future in detail three years ahead. Consequently, summarizing the major sales and cost categories are the best that most people can do. Secondly, it is easy to fail to see the forest for the trees. Thus, focusing on the major items helps to provide the detail for the nearby cash flow. A simplified cash flow layout is shown below. This can be modified to fit the system in any firm.

	Time Period 1	Time Period 2
opening cash balance		
CASH IN		
sales		
other cash income		
new borrowing		
new equity additions		
Total cash available	(A)	
CASH OUT		
cash costs		
owners' salaries		
asset purchases		
principal payments		
owners' taxes and SS		
Total cash spent	(B)	
(A) - (B) is closing cash balance		

Figure 9. A basic cash flow layout.

Any one of these row names can be divided into its components to provide detail or be summarized to present a succinct picture. The cash costs, for example, could and possibly should have 30 to 40 rows in the first cash flow and maybe 4 or 5 in the annual flow. It may be useful to use a third or a separate loan section in the above figure to itemize each loan and keep a running total of the current debt situation.

The cash flow times debt repayments. It shows when there is cash and when there is no cash. Use it to present sensible debt scheduling to lenders. It is the firm's cash flow rather than the lender which shows what can be done in paying interest and principal. Make sure that all parties involved understand this. The cash flow also incorporates new events. As events change, so will the firm's results. Thus, the cash flow must be changed constantly to reflect these changes and to reflect increasing knowledge of what will happen to cash inflows and cash outflows. The alterations show the results of the changes.

It shows when the firm can afford to buy assets. If the cash is not there and the asset is needed it shows the consequences of increasing the debt load. It also shows how much salary can be drawn by the owners and the consequences of paying salary rather than spending the cash on other things.

Monitoring compares predictions with what actually happened. Predictions will be wrong and, the further away the predictions, the less accurate they may be. But the firm has to buy and use resources such as fertilizer and labor before it produces sales. These are normal business risks. The cash flow helps to think through this process. A good cash flow shows more than just predictions. It also shows the actuals, side by side with the predictions. Table 1 shows the next step.

Table 1. The proper cash flow. ($'000)

	JULY			JAN TO JULY		
ITEM	predict	actual	diff	predict	actual	diff
Sales	40,000	0	(40000)	300,000	240,000	8% down
Costs	30,000	32,000	2,000	200,000	205,000	3% up
salary	3000	3000	0	21,000	24,000	14% up
prin. pt	5000	0	(5000)	30,000	25,000	17%down

This cash flow has three sets of columns. They are used for the nearby cash flow only. One set lists the row names as before. The second lists the predicted, actual and the difference between them for the current month. The final set lists these same three columns for the year-to-date. The idea behind these last two sets of columns is not to over-react to temporary events when the firm is basically still on track. Thus decisions should be made from the last column rather than the monthly difference column.

For example, there were no sales in July when the prediction was $40,000. This could be alarming, but the last set of columns show that the firm is only 8% down on the whole year so far, including this past month. So if the product was not quite ready for sale in July, then there is not much to worry about. Sales predictions have been pretty good. (Another story if there were other reasons for no sales in July, such as poor quality or price falls). Costs are also well predicted. The reason for no principal payments was because there were no sales. The only problem with these numbers is that salary is higher than was predicted and this needs to be watched.

It is probably more useful to use percentages than numbers to express the differences between predicted and actuals. Percentages summarize the differences better. For example, a reduction in sales of $1 million looks startling, but if it is equivalent to a 3% drop, this does not seem too bad. So the essential purpose of the cash flow is to make decisions doing it and from it. These decisions include ones on predicting and on the difference between the predictions and the actuals.

Producing, reviewing and using a cash flow are among the hardest tasks that a manager can do. But because cash is so vital today, it is this task that brings the highest reward. Budgeting right is managing right. No one in the firm can do the job right unless it is the right job for the firm. And the cash flow is the culmination of the right job.