THE PRODUCTION PLAN

The development of a production plan for a nursery must flow directly from a well developed marketing plan. The marketing plan will be the determining force in the quantity, variety and size of the plant material produced. The long term sales plan will also be used to determine the targeted levels of ending inventory for each size and variety of plant. i.e. the inventory that must be held back from immediate sales for potting field planting.

The production plan should contain the following components:

- A description of land, buildings and facilities
- Equipment planning
- Material and supplies and what these will cost
- Scheduling
- Production strategies

Land, Buildings and Facilities

In this section, describe the land, buildings and facilities you currently have. If changes are planned, include this in your business plan. The buildings and improvements are detailed to illustrate the kind of thinking you need to do up front when planning or expanding your facilities. Although not shown in the example used here, a key part of your facilities planning should be a layout, drawn to scale. This will help ensure that you have chosen the right facility and will help you in estimating any facility improvements that may be required.

Equipment

Planning around equipment involves a consideration of purchase price and maintenance costs. It is recommended that a simple fixed asset register be maintained. This will enable you to track machinery and equipment, and consider replacement when maintenance costs become too high, or the machine reaches a certain age.

If additional equipment is being considered, the date of proposed date of purchase should be noted, as this will have an impact on the cash flow projections. If financing is available, this should also be recorded.

When obtaining cost information, be sure freight, installation, warranty service and taxes are included or excluded from the prices you are quoted. Also check on lead times for delivery once you have placed your order. Start researching your equipment well in advance of the time you will need it to allow enough time to select equipment and suppliers and to place orders.

COMPENSATION AND BENEFITS EXAMPLE

Position	Salary and Benefits
Owner/Manager	$55,000
Office staff - receptionist (full-time)	$20,000 plus 5% benefits
- bookkeeper (part-time)	$15,000
Sales staff	10% commission
Potting supervisor	$26,000 plus 5% benefits
Potting staff - temporary (5)	$7.75 /hr (includes CPP, UI)
Shipping supervisor	$26,000 plus 5% benefits
Shipping staff (2)	$7.75 /hr (includes CPP, UI)

Labour and Training Goals Example

Target	Barrier	Planned Response	Measurement
Employee safety - an accident-free workplace	Knowledge; working conditions; cleanliness	Training; employee manual; regular clean-up; awareness and supervision	100 accident-free days
High productivity	Work habits; lack of knowledge and/or experience	Attention to employee concerns; regular performance reviews; training opportunities; workplace design including purchase of automated potting machine; management style	4,000 one gallon pots per day
Low staff turnover	Demand for skilled workers by other firms; repetitiveness of labour operations	Attention to employee concerns; regular performance reviews; training opportunities; job rotation; profit sharing incentives	Tenure of greater than 2 years

LAND, BUILDINGS AND FACILITIES & EQUIPMENT EXAMPLE

Location:	Fraser Valley
Description:	Wholesale nursery operation, growing large variety of trees, shrubs, ground covers and some field stock
Size:	10 acres: 5 acres in field stock; 5 acres in containers including 30,000 sq. ft. poly house space
Owned or leased	Owned
Buildings and improvments	10 older wooden greenhouses - 30' x 100' Assortment of out buildings

Description	Cost	Estimate of Maintenance and Repairs Over Next Year
10 Greenhouses	$50,000	$500
4 Tractors	$60,000	$3,500
20 Trailers	$30,000	$1000
1 Bobcat	$27,000	$1,500
1 Tractor mounted sprayer	$5,000	$500
1 5-Ton truck	$40,000	$2,000
Irrigation equipment	$5,000	$1,000

MATERIALS AND SUPPLIES

You will need to research your material requirements by preparing a detailed list for the products you plan to grow or produce and then calculating the inputs you will need. The raw material purchasing plan must take the following into consideration:

- Specific quantities of each product needed to support the monthly production plan.
- The average price of each product.
- Lead-time needed to obtain each product.

Key to the most prudent economic production planning is the planning of inventory levels of raw materials. To determine the economic strategy of inventorying raw materials the following must be considered:

- Volume discounts vs. cost of financing larger purchases
- Potential changes in supplier prices
- Cost of running out of key supplies in the middle of production
- Realistic delivery times from the time of order

Based on these criteria, the maximum and minimum levels of raw material inventory should be set. The production levels are based on the sales requirements in future years. It can be assumed in most cases that the production required in year 1 should be equal to the sales in year 2. (The lag time may be longer if you are using 5 gallon pots, but the process is the same). The production figures must therefore be tied back to sales for future periods.

Scheduling

A production schedule must be produced that provides the needed product on the time line as defined by the sales objectives. This is especially critical in the nursery industry with its narrow windows of sales opportunity (major sales in the spring of each year) and the long production cycles and inventory carrying costs. Good production scheduling takes the following factors into consideration:

- Costs associated with producing and maintaining an inventory that is not immediately translated into sales.
- Cost associated with lost sales due to unavailability of inventory for sale.
- Ability to purchase needed inventory from other sources to meet production or sales shortages.

The production plan should set the minimum and maximum levels of inventory acceptable for each product and size. The minimum should be set based on the confidence put in the sales figures with the need to hold inventory for potting on to larger sizes. If there is a high degree of uncertainty in the sales figures the nursery must consider its financial status to be able to hold higher then desired levels of inventory over the winter vs. its potential for lost sales due to lack of inventory.

MATERIALS, SUPPLIES AND SCHEDULING EXAMPLE

This example outlines the production planning process for one gallon nursery stock, assuming a four month production period.

		Feb	March	April	May
Production level	(A)	10,000	40,000	40,000	15,000
Liners-in house	(B)	5,000	20,000	20,000	10,000
Liners-purchased	(C)	5,000	20,000	20,000	5,000
Pot inventory - beg. month	(D)	20,000	10,000	0	0
Pot usage	(A)	10,000	40,000	40,000	15,000
Pot inventory - end of month	(E=D-A)	10,000	0	0	0
Pot requirements	(F=A-E)	0	30,000	40,0000	15,000
Soil inventory M^3 (Yd) - opening	(G)	50	21	0	0
Soil use pots M^3 (Yd) (based on pot)	(H)	350	350	350	350
Total soil usage	(I=A/H)	29	114	114	43
Soil inventory - end of month	(J=G-I)	21	0	0	0
Soil requirements	(K=I-G)	0	93	114	43

Note: The calculation of soil requirements is based on the volume of the pot. This is calculated by:

1. calculate the volume of the pot $\pi(r^2)h$
2. change volume of cm^3 to m^3
3. divide 1 m^3 by the volume of one pot. This gives the number of pots per m^3
4. since many people are still working in Imperial units, the calculations are often done in y^3 rather than metric.

The following example is for #1 (one gallon pots)

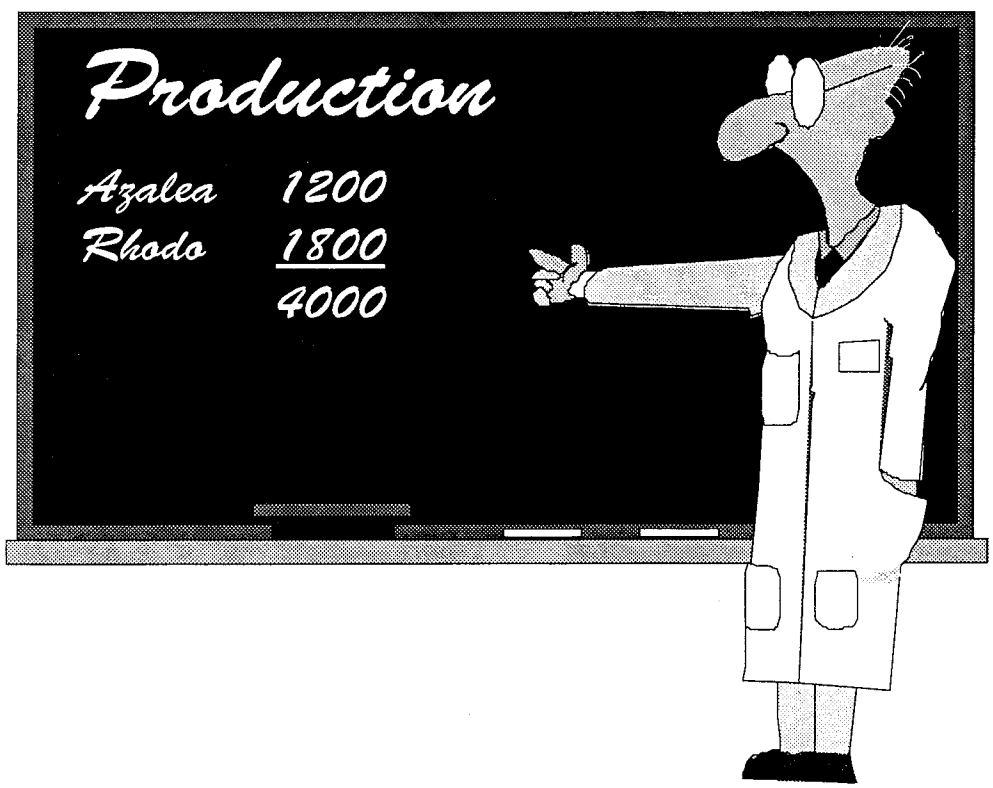
pot size	=	15cm x 18cm	=	$3179cm^3$
volume	=	$3.14(7.5^2)(18)$	=	$.003m^3$
volume in m^3	=	3179/1,000,000	=	333 per m^3
pots per m^3	=	1/.003	=	300 #1 pots per m^3

less spillage and other losses approx. 10%

PRODUCTION STRATEGIES

You will need to carefully research and thoroughly understand the crop you are planning to grow, the production system you will be using as well as how to avoid potential problems. Keep abreast of innovations and research and incorporate new technology in your production system to improve efficiency. This information can then be used to develop plans to optimize yields, grades and profits through appropriate production and labour management activities.

Our example of a production strategy shows the thinking behind a nursery operation that wants to move into major azalea production.



PRODUCTION STRATEGIES EXAMPLE

Description	Target Yields	Barriers	Response
#1 pot azaleas	4,000/day 50,000/year	• lack of automated potting equipment • lack of reliable overwintering facilities	• purchase automated potting equipment • construct heated polyhouses