Production cycles at Sheridan Nurseries©

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SHERIDAN NURSERIES

Sheridan Nurseries was established 1913 and is located in Georgetown, Ontario, operating 8 Garden centers in the Greater Toronto area and two growing farms totaling 900 acres (Figure 1). We are growing 1200 cultivars of hardy nursery stock and perennials, and propagating over 2 million plants per year with 5 million plants total in production.

Figure 1. Main growing farm in Georgetown, Ontario, Canada.

PRODUCTION PLANNING

Production planning should be fairly simple, right?

1) Ask sales, how many plants do you need ready? When do you want them ready?
2) Work backwards—how long does it take to grow each stage (Figure 2) and start propagating.
3) Wait 1-7 years for the plants to grow.
4) Sell all the plants.

Figure 2. Example of production stages for *Buxus* 'Green Velvet'.

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But then, there are a few things that complicate the process:

- We grow 1200 cultivars, in 2000 SKUs (different sizes).
- Often use one size to make another (shift up), and may sell off a portion of the smaller size at each stage.
- Different liner plant size, can vary by year and growing time, depending on supplier and weather so sometimes the plants are ready faster, or slower than we planned, or some die or are unsuitable for sale.
- And sometimes they are all beautiful and ready on time but market conditions have changed and they don't sell.

So they end up on the scrap pile which is a very expensive loss for the business.

BUSINESS NEEDS

Our challenge is to run a sustainable business that earns enough profit each year to invest in our facilities, provide an environment for staff to grow their skills and reward owners for their investment. To do this we need to set targets:

Yield: 94% of each crop we pot to sell at normal price (does not include sales at a large discount, scrap, or shrink), includes 3% growing loss and 3% sales loss.

Gross margin: 35%+ gross margin at 1-2 year crop cycle. This farm margin then covers shipping, sales, and head office functions, with profit left over.

Tools available

To help with production planning there are several tools available:

- Experience of staff and colleagues. How long does this plant take to grow? What if we change one aspect? etc.
- Historical data in database and spreadsheets you have already or can start tracking.
- Time need to set aside enough time to analyse each plant.
- Know your crops, make sure to include staff that have experience growing and selling particular crops over several years/business cycles.

FIVE STEPS TO FORECAST AND PLAN

Each company will have their own way to forecast and plan how many plants to grow in a given year. This is how it is done at Sheridan:

1) Forecast demand
2) Inventory/orders forecast
3) Want number
4) Liner size and growing time
5) Review and stay nimble

To help explain the process we'll look at one plant as an example: *Hydrangea arborescens* 'Annabelle' #5 container. Here are the main steps to produce this plant. Summer softwood cuttings are taken from existing stock and rooted into 2-in. plug.

- Year 1: spring plant 2-in. plug into 3 row field beds, grow for 2 years.
- Year 3: spring dig bare root plants from field and grade to size; spring pot bare-root liners into #5 containers. If not enough plants available then can bump our own #2 container or buy in #2 or bare root to make up difference. Summer, plants are ready and start selling. Approximately 50% sell in bloom.
- Year 4: leftover 50% of crop sells during spring and early summer until new crop is ready.

Forecast demand

Forecasting demand requires good sales history data, knowledge of previous inventory, how your customers and competitors are likely to change and some 'gut feel'. We hold a 3-day meeting each winter to review every plant and SKU we grow. Make sure to have:

- Previous sales quantity and price over last 3 years.
- Main customers, price trend, gross margin.
- What quantity is presold (you already know who is going to buy it).

- Mass merchants account requirements.
- Brands—new plants coming, possible cannibalism with established cultivars. An example of new plants that may compete with *H. arborescens* 'Annabelle' (Table 1).

For our example, we decide the future sales number for *H. arborescens* 'Annabelle' in #5 container is 1,000 year^{-1}.

Table 1. Plants that may compete with *Hydrangea arborescens* 'Annabelle'.

Hydrangea arborescens NCHA4', Incrediball® Blush
H. arborescens 'Abetwo', Incrediball® smooth hydrangea
H. arborescens 'NCHA8', Invincibelle Limetta® smooth hydrangea
H. arborescens 'NCHA5', Invincibelle Wee White® smooth hydrangea
H. arborescens 'NCHA7', Invincibelle Mini Mauvette® smooth hydrangea
H. arborescens 'NCHA3', Invincibelle Ruby® smooth hydrangea
H. arborescens 'NCHA2', Invincibelle® Spirit II smooth hydrangea
H. arborescens 'SMNHALR', Lime Rickey® smooth hydrangea

Inventory/orders/forecast

Therefore our job at Container Farm is to have 1,000 available for sale each year. Now we need to look at:

- Inventory that is ready now.
- Current orders, so how many are available.
- Next crop coming on, how many and when ready.
- Crop time to finish, timing of the selling season.

From Table 2 for #5 container we see:

- Inventory = 888 in # 5 container.
- Current orders available Jan 2018 = 459.
- Next crop coming on = 0 till July 15 new crop, not shown in table; July 15 is when the newly potted crop we are calculating will be saleable.
- Selling season to July 15 in 2017 = 639; other records show that we can sell an additional 639 plants by July 15.
- 639 – 459 = -180 sold out!
- Before July 15, 2018 we'll be sold out.

So the forecast demand sales number = 1,000 and inventory/sales shows we'll be short 180 units.

Table 2. Inventory and sales: shortage calculation.

			Inventory			Inventory		Full year sales		
		List price	Avail. now to Jan 2, 2018			Avail. between Jan 3, 2018 and Jun 5, 2018		2017 to date (Qty)	2016 (Qty)	2015 (Qty)
Botanical	Size	2017	In stock	Orders	Avail.	June 2018	Orders			
Hydrangea arborescens 'Annabelle'	# 2 CG	$13.50	2,532	513	2,019	5,208	1,139	4,612	5,364	3,927
Hydrangea arborescens 'Annabelle'	# 5 CG	$24.50	888	429	459	0	0	1,026	884	918

Want number

The Want number is how many do we pot in 2018. Working backwards from ready date and scheduling to forecast sales. Build an Excel® template so we can see quantities selling and being produced:

- Want number = how many do we pot in 2018?

• Need 180 before July 15, round up to 200.
• 1,000 for rest of 2018 and Spring 2019.
• Want number = 1,200 (need to pot 1,200 in Spring 2018).

What liners are available to meet the potting target of 1200? There are 500 from self-produced (GW), bump, or buy in? Are there any of our own #2 available to bump up? There are 2,019 available (Table 3) which we will sell by June and then 5,208 for the next crop cycle. The sales target for #2 container size is 5,000 and with orders against the June crop of 1,139 already we forecast to sell the whole crop, so none are available for bump.

Table 3. Potting plan.

Product	Gallon	Projection 2018	Want 2018	Incoming	Supplier	Note	Bump
Hydrangea arborescens 'Annabelle'	5	1,000	1,200	500+700	GW/buy	No #2 avail. for bump	

Liner size and growing time

We need to find 700 more liners to add to the 500 self-produced to meet our Want number potting target of 1,200 units. At this point we may walk own liner crops again to check on size, variability, and double check the counts. Options for liners to put in the #5 container:

• Bare root is available at a cost of $5.06 landed.
• Buy in #1 or #2 size to shift up.
• What is the margin if we buy in?
• Will the buy in meet our 35% target?

At this point we often work with our supplier partners (Figure 2) who can recommend what liner to finish in a certain time and cost.

Figure 2. Shipment of potted liners arriving from supplier (Spring Meadow Nursery).

Review and stay nimble

Let's review the margin if we use the bare-root liners from above. Once your production costs are known, a simple spreadsheet can be created to plug in list price, liner cost, growing time to show forecast margin (Table 4). In this case the bare-root liner at $5.06 landed gives us 39% margin, so meets the 35% minimum target.

Table 4. Margin/cost template.

List	Net sell	Gross margin	Total cost	Liner	Factor	Liner landed	Pot	Grow	Grow years	Net grow	Yield	Assembly/ tag
24.50	19.60	39%	11.88	4.60	1.10	5.06	2.01	3.37	1.00	3.37	0.97	1.12

Our decision is to pot the 1,200 *H. arborescens* 'Annabelle' #5 from 500 of our own liners and 700 bought in as bare-root liners. We also need to review in the coming winter:

- Want number again before potting. If bookings are way up, we may want to increase potting number.
- Hold at 1,000 units to plant in bed liners in 2018 to pot up in 2020?
- Hold at 1,000 units to propagate in 2018, to plant out in 2019 and pot up in 2021?

There are always ways to improve the production planning method. At Sheridan Nurseries we are still working on:

- Improving ways to monitor so we know earlier when a crop is not selling on plan—adapt selling plan, potential future surplus.
- Check monthly what is booking/selling way more or less than same point last year. Can we increase production?
- Improving forecasting for new cultivar demand.
- Shorter crop cycles, eliminating steps so that in production we can react sooner to market/demand changes.