

## Ornamental Production at Bordon Hill Nurseries

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### INTRODUCTION

Having spent over 30 years in the nursery stock sector growing shrubs, trees, climbers and perennials for the retail market I joined Bordon Hill Nurseries growing seed and cutting raised plugs for the grower market. Whilst similar in some ways, we grow an ornamental plant destined for the retail market. The sector and the product are very different. My presentation explores the challenges the sector and in particular the grower faces and how Bordon Hill works to meet these challenges.

One enviable advantage we have as a grower of young plants that are quick to finish is that whilst we do produce some speculative product the vast majority of what we grow is not stuck or sown until we have an order for it. Our customers place firm orders for specific delivery weeks. This helps ensure we have minimal wastage and keeps our risk to the fluctuations in the market place far lower than growers who are continually speculating for the majority of their sales.

As a result of placing firm orders for specific delivery weeks our customers expect

us to supply what they ordered when they ordered them for, and this is where our challenges begin. We supply both the commercial and mail order markets and offer 35 tray formats across a broad range of varieties resulting in over 4,100 different products grown across 22,500 batches being produced at the three Bordon Hill sites. When we grow a product for a specific week number in most cases it will only remain saleable for that one week, when we sow or stick, we are sowing or sticking for supply in only one week.

I recall the challenges of having to get a number of different varieties of shrub or perennial ready for the first week of a sales month. In week 14 of this year Bordon Hill supplied 151,975 trays across 1,255 different products or batches, each product having a different length of time in production, a different nutrient requirement and a different climate requirement to ensure it was in ideal condition for sale in week 14. Keeping track of all of these batches and making sure they get just the right growing requirements is incredibly complicated from the management

of orders to the ordering of seed through sowing, gapping, transplanting, climate control and nutrition there are endless opportunities for it to go wrong. It may be attractive to have short production cycle but if the plant is sown late, gapped late or transplanted late we will miss our sales week. If there is a P+D or nutrition problem with a product that has a 4-week growing period identifying the problem and putting it right is time sensitive to say the least.

### **Management of Information**

Accurate management of information and making this available to our staff is critical from ensuring the availability of seed, materials and staff to planning work flows and recording outputs. Whilst off the shelf planning packages do exist, we have not taken this route but have a dedicated IT team who have written a bespoke planning and information management system. Initially this was written as an access database system but more recently the team has been writing and migrating our systems over to a web-based system improving security, functionality and access from multiple locations.

Being able to track progress of any batch through the system is critical from a production management perspective but also from the perspective of being able to provide information to our customers. The system enables us to be able to see progress with a customer's order from order placement through all production processes through transport to the point of delivery.

### **Growing profiles**

Every product has a pre-determined growing period or profile which changes as we go from one season to another. A plant with a 5-week profile for sowings in week 50 to week 10 may then have a 4 week profile for later sowings. The growing profile determines the sow week, gapping week and transplanting week if applicable to meet the required sales

week. Running trial production batches of new product introductions enables us to establish accurate profiles for new introductions.

### **Growing protocols**

Growing protocols determine temperature, shading requirement, lighting, particular pests or diseases to monitor for and details of nutritional requirements. We are working to ensure all of our products have growing profiles that guide the growing team in making decisions on how to treat the crop. They are not hard and fast blueprints as the season and general climate have such an impact on growth. Profiles and protocols are reviewed regularly as improved breeding can result in changes beings required to both.

### **WhatsApp**

With such short growing profiles, If there is an issue or problem we need inform our technical team in as timely a manor as we can and arrive at a diagnosis as quickly as possible. We use Whatsapp to help achieve this forming a technical group who post images, batch details and information about the issue. The tech team will then go on site to assess the batch, collect samples, diagnose the problem and post a recommendation for treatment. Squeezing water out of the plug and analyzing for EC and PH is relatively straight forward whereas plating samples and using the microscopes to diagnose soil borne diseases is a little more involved but it is essential that we diagnose diseases like Pythium or Rhizoctonia within 24 hours. We can lose a whole crop if delayed for more than this.

### **Nutrition**

We can't use control release fertilizers in tiny cells, the distribution is not accurate enough and we also need far great control to ensure we hit the correct week numbers for every batch. We use a series of liquid fertilizers

starting with a base level feed that most crops receive then more specific feeds to suite the particular crop and the period of its growing cycle. We use the growing protocols to guide our growers but they will also make changes and alterations to manipulate growth and hit week numbers.

### **Irrigation control**

Getting irrigation right is critical with such short growing periods. Too wet and root growth is poor and disease can be a problem, too dry and the plant is dead within hours. The temptation is almost always to over water as too dry is obvious and devastating whilst too wet means the plant is still alive, all be it compromised. Sensors can be used for larger cells but don't currently exist to use in the tiny cells we are working with. We have been working with a system of tray weighing to help turn something like irrigation that can be so subjective into a more objective science. In reality it is our growing team who are establishing and working to wetting up and drying down targets and so improving growth control through the control of irrigation.

### **Growth control**

Whilst good irrigation management can help growth control, we still need plant growth regulators to help us produce the plants our customers require. Our growing supervisors walk the crop on a daily basis to agree PGR requirements using hand held devices to set up PGR application plans for the growing team. Weather and time of year have a huge impact on PGR requirement so rather than work to pre-determined programs we have to have to continually assess requirements. Reducing our dependence on PGR's is an area we are working on over the next 12 months, climate control, nutrition, irrigation and improved breeding should all help reduce the need for growth regulators.

### **Vapour pressure deficit or VPD**

Vapour pressure deficit is the difference between the amount of moisture in the air and the amount of moisture the air can hold when it is saturated. The higher the VPD the greater the stress the plant is under. Some VPD is essential in pushing the plant to make roots and put on growth but too high a VPD can result in the plant being stressed and suffering growth abnormalities. During this season we identified tip abortion in Petunia during a period of very low VPD. We have been using accurate VPD monitoring on susceptible crops to help identify periods of stress and using shade screens, irrigation and climate control to reduce stress and maximize growing conditions. Whilst VPD is a relatively new technology for us it is proving to be another powerful tool to help improve plant quality.

### **Supply**

We are constantly assessing crops through their production cycle and making changes in feeding, climate control, PGR application and irrigation to ensure they meet their supply date. We don't get it right 100% of the time but do inform customers if changes need to be made, offer alternate delivery dates or substitute varieties should we need to.

### **Tech transfer**

There may be techniques used by seed raised bedding growers that other growers could utilize to help in production. On site disease diagnosis, objective irrigation analysis (sensors can be used in containers larger than tiny plugs), Vapour pressure deficit, WhatsApp groups and supplementary liquid feeding to name but a few. Many growers will be using these techniques but if you are not there are opportunities you could consider.