

## Perennial Production at Valleybrook Gardens Ltd.

**John Schroeder**

Valleybrook Gardens Ltd , 1831 Peardonville Road, Abbotsford, BC Canada V2S 1M3

### INTRODUCTION

Valleybrook Gardens is a large, wholesale production nursery located near Abbotsford, British Columbia. Abbotsford is in the Fraser Valley region of BC, east of Vancouver, and is in USDA Zone 7.

Our sales are primarily made to independent garden centers throughout western Canada and the Northwest U.S. Production consists primarily of herbaceous perennials in containers, but also includes herbs, ferns, ground covers and grasses. Some annuals are grown in 15-cm (gal) containers for summer sales as well. Several million containerized plants are grown annually, comprising over 1000 taxa.

The production of herbaceous plants puts a grower into a separate class, distinct from both greenhouse growers and nursery managers, but sharing characteristics of each. Propagation, as well as a considerable amount of production, takes place in protected environments, yet many plants perform best outside in a nursery environment. The boundaries between these different classes of growers is diminishing, as bedding growers are dabbling in seed production of perennials, and nursery growers are diversifying from junipers into daylilies.

At Valleybrook Gardens Ltd, one of the most important steps in production occurs before any plants are propagated. This step, often overlooked in our industry, is marketing. Marketing drives almost everything we do at Valleybrook, from selecting varieties, setting prices, even the colour of our pots. Although marketing is such a vital part of what we do, it is a major issue best addressed at another time.

### PROPAGATION

At Valleybrook Gardens, most plants sold are propagated on site. Exceptions would be where crop failures have occurred, where new varieties of plants are required, or where plants are propagated by tissue culture. The three main techniques used here include seeding, cuttings, and divisions.

**Seeding.** About half of the 9-cm plants grown at the nursery are propagated by seed. Seeding is carried out using several styles of seeding machines. The majority is done on a Blackmore seeder, into 288 or 512 trays. Perennials seeds come in all shapes and sizes, however, and many cannot be sown with this style of machine. We also use two models of the Vandana vacuum plate-type seeders, which are more labour intensive but more adaptable to these seed types.

Germination of perennials can be quite inconsistent compared to annuals. Various treatments including pre-soaking and stratifying are necessary for some species. Information on requirements for individual species can be hard to find, requiring considerable experimentation.

Once seeds are sown, they are moved into our fog house for germination. The foghouse consists of a gutter-connected range, utilizing bench-top micro-climate

heating, several styles of fogging systems, and high intensity lights to allow photoperiodic control. A few perennials are pre-germinated in our cooler before entering this house.

After growing past the cotyledon stage, they are liquid fed until moved out for hardening off. We use 20-20-20 at 50 to 200 ppm. The length of time between sowing and potting can range from 4 weeks to many months, depending on crop and time of year.

Seeding is generally the least expensive propagation method, but it only works for a limited range of plants. For this reason, we utilize some of the following asexual propagation methods.

**Cuttings** Cuttings are taken almost the entire year although peak time is from May to September. Stem cuttings are used as a primary propagation method for many of the most important crops at Valleybrook. Root cuttings are used on a limited number of perennials.

Most herbaceous plants root easily, and don't require hormone. We do use hormones, however, to increase the speed of rooting. The less time cuttings spend in the propagation house, the less space we require. Cuttings are rooted in media consisting of various ratios of peat and pumice. The media is placed in plug trays, ranging in size from 98s to 200s. Once rooted in the foghouse, plants are moved out and hardened off before potting.

Since we are now producing so many plants, the issue of stock plant management has become very important. We have moved from the concept of stock plants in pots to in-ground stock beds. This is done for many reasons including increased winter survivability, reduced maintenance costs, and also because the sales department finds it more difficult to sell stock plants required by the propagation department. Finally, stock beds can be used to beautify and landscape the nursery property.

It is very easy to spend large sums of money and time on stock beds, even in the ground. Stock plants require replacement ranging from every 2 to 5 years, depending on species. Weeding is an expensive task, so we use weed barrier cloth as one labour-reducing method. Plants require fertilizing and occasionally pruning to encourage good cuttings at the appropriate time.

Since reducing the number of stock plants required for a given production number reduces these costs, we have been experimenting with growth regulators such as gibberellic acid to increase the number of cuttings per plant. Results have been interesting, with a real benefit for some plants. *Ajuga*, a plant that is certainly easy to root but that does not often produce a lot of stem cuttings, responds marvelously to GA<sub>3</sub>.

The use of GA<sub>3</sub> and other compounds has only been experimental until now. After a few years of work, we should have extensive data on what works on which plant. At this time, however, it appears that GA<sub>3</sub> increases internodal length, and growth rate, without affecting the rooting percentage of cuttings. This effect depends on the time of year, with most varieties responding most strongly early in the growing season.

**Division** At Valleybrook we have been using division with our own open ground stock for about 3 years. This technique is used for those varieties which cannot be propagated effectively any other way. We grow only certain varieties ourselves, primarily those that are very expensive, or difficult to obtain from other growers.

For the run-of-the-mill items, such as *Astilbe* or *Iris*, we cannot compete with products purchased from large, specialized, and mechanized growers. Our own divisions have been very useful in allowing us to bulk up new varieties imported from Europe.

Divisions are made primarily in the spring or fall. For some varieties timing is important, for others less so. After being dug, they are split by cutting or breaking apart, and then potted, usually in 15-cm pots. Bare-root perennials often have bulky roots of all sizes, making mechanized potting of these items difficult.

## GROWING ON

There are two peak potting times at Valleybrook. Summer potting begins in August and ends around the middle of September. These plants require overwintering and are sold early in spring. A second flurry of potting takes place from March until May. These plants are sold later in the spring and into the summer and fall.

Plants are grown in either 9-cm, 11-cm, or 15-cm square, plastic pots. The growing media consists of peat, fir bark, and pumice amended with Dolomite lime, gypsum, and time-release fertilizer. We mix all our own soil in a rotating drum mixer, and since we grow so many different crops, we use more than a dozen soil mixes. Each of these involves a different ratio of ingredients.

Weed control is an ongoing battle, since many of the weeds so closely resemble the crops we are growing, and so few herbicides are registered. We rely extensively on hand weeding, which is very expensive, and not generally considered a plum posting by the unfortunate staff assigned this responsibility. The main weeds we battle are liverwort and snapweed (*Cardamine oligosperma*). Lesser weeds include *Poa annua* and *Sagina*.

Keeping our plants alive through the winter is one of our enduring challenges. Five years ago, we failed miserably in this effort and lost 70% of the plants on our nursery. Three years ago, we lost 40%. These winters were some of the lowest points in our history and we have learned much from them. We looked at every aspect of our production to reduce the risk of this happening again.

The main winter problem we have is with inconsistent winters. One year may be exceptionally mild, with perhaps -5C the coldest temperature. The next may be equally mild until the end of January, when the temperature can drop from 12C to -18C in 12 h, to accompanied by 100-km winds. If we could rely on consistent winters, or on snow cover, protection would not be a great issue.

We have responded by dividing our plants into differing overwintering regimes, based on our hard won experience. These are:

- Outside unprotected
- Outside covered when required
- Cold frames
- Cold frames with supplemental heat

Outside covered means that plants are left uncovered until weather predictions call for an Arctic outbreak. Our system allows us to cover the entire nursery, using 4 to 6 people in half a day. We used a spun-bonded polyester for a cover in the past, but now use a heavier material commonly used for heat retention curtains in

greenhouses. Heated greenhouses are normally only heated to around the freezing point and only when outside temperatures plummet or new growth has begun.

We have also been experimenting with growth regulators in our growing stage. Here, we have found success both with speeding up growth and in maintaining a more compact plant for ease of shipping. Results here again are experimental, but show good promise for the future.

## **COMPUTERIZATION**

Timing is everything in producing good perennial crops. Plants potted too early can overgrow and become unsalable in 2 weeks. Plants potted 2 weeks too late in the fall can be too small to withstand winter. With the complexity inherent in producing millions of units of over 2000 products, many of which grow at different rates and require different growing conditions to satisfy the needs of customers in diverse climates, it is imperative to be highly computerized.

In fact, virtually every aspect of life at Valleybrook Gardens is governed, regulated, analyzed, recorded or directed by the computer. Several years ago, a custom scheduling program was written for our nursery which specifies every production step required each week. This includes seeding requirements, cutting requirements, and potting requirements, including numbers, soil mix type, overwintering requirements, and much more. It even generates orders for seeds from suppliers, taking into account seeds per gram, germination rates, and quantities of plants required.

Bar code capability is included in this software and has been used for two years now. These bar codes are currently used for internal use only. We use these codes to provide our customers with updates on plant availability, to update plant locations in our computer and improve our shipping efficiency, and also to provide sales information for our marketing decisions. In the future, we envisage extensive increases in the use of bar-codes throughout our operations.

## **CONCLUSION**

At Valleybrook Gardens our focus is on providing plants when the customer wants them, in the condition the customer expects. This should be the goal of everyone in the nursery business, and I expect it is the goal of most of the growers here. Our customers, however, remain the final judges of how successful we are.