

QUALITY IN CONTAINER-GROWN NURSERY STOCK

JOHN MASSOT

Massot Nurseries

Richmond (Vancouver), British Columbia

Container nursery stock is grown in an artificial manner in comparison with field-grown nursery stock and does, therefore, require more attention at specific times in order to produce a quality product, which will both sell and give satisfaction to the buyer.

What I have to say on quality is more or less the fruit of our own experiences over the last 8 or 9 years. I will indicate what we are doing and why we are doing it. Climatic conditions have to be taken into consideration; therefore, keep in mind that our ways of doing things have been geared to the climatic conditions in Vancouver, B. C., which may not be correct in a warmer, colder, or drier climate.

We started growing nursery stock in containers 8 years ago with only a few thousand 1-gallon cans to our present volume of over 100,000. In addition, we also grow a fair volume in 2¼", 3", 4" pots, 2 gallons and 5 gallons. We are not, by any means, a large producer of container-grown nursery stock, but we have always placed emphasis on quality and we are constantly trying to improve our methods to produce a better product.

I will divide my talk into two sections: (a) What you "must" do and consider in order to produce a saleable product, and (b) What you "may" do or "may not" do, or consider. This second section will often mean the difference between a *saleable product* and a *quality product*.

(A) *What you must do and consider:*

- | | |
|-----------------------------|------------------------------------|
| 1. Soil . . . potting mixes | 4. Watering |
| 2. Container | 5. Fertilization |
| 3. Liner | 6. Control of insects and diseases |

(B) *What you may or may not do, or consider:*

- | | |
|-------------------------|-----------------------|
| 7. Pruning and pinching | 10. Winter protection |
| 8. Spacing | 11. Supervision |
| 9. Weeding | 12. Timing |

We have now a dozen points to consider; giving them all your best attention you must end up with a top quality product. On the other hand, you need to neglect or disregard only one of them and the result will most likely be a second or poor quality plant.

1. *Soil*: Soil is most important, as we all know, and more so in container growing where the plant's roots must develop in a very limited volume of growing media. We are using the U. C. Mix system and are satisfied with it.

The main components (peat moss and fine sand) are readily available in our area at a reasonable price which makes it even more attractive. At first we used a mixture of 50% sand and 50% peat. Mainly to reduce weight, we changed later to 75% peat and 25% sand. Results were excellent in both mixtures. Weight is always a problem and we are still looking for a lighter mixture.

2. *Container*: We mainly use metal containers which we like for their rigidity and easy handling. Some nurserymen prefer plastic. Cost is often a factor. Color is also important. We had more winter injury in black colored containers, which do absorb heat, than in silver colored, which reflect it. The container size must be proportionate to the size of the plant. Avoid containers with drainage holes at the bottom as the roots will grow through and stop drainage. Large side holes are better.

3. *Liner*: Always plant a strong healthy liner if you want a good product. The saying "a poor colt will never make a good horse" is quite applicable to nursery stock. A good, strong, healthy liner is the main key for eliminating losses and culls and for producing a uniform crop.

4. *Watering*: Watering is very important. It should not be overdone yet the plants should never be allowed to get bone-dry at any time. We use overhead sprinklers on a 4' riser every 30 feet. The water is turned on early in the morning or late in the evening, when the air is calm, for even distribution of water. We turn the water on for about 1 to 1½ hours every two days during the summer months and only when necessary in spring and fall.

5. *Fertilization*: Proper feeding is one of the most important factors in the production of container nursery stock. We find it expensive mainly because we still do it by hand, going from pot to pot. We tried feeding through the irrigation line but did not find it satisfactory because the different varieties of plants we grow do not all require the same fertilizer.

Our fertilizer program is in liquid form, using 20-20-20, 27-18-9, also 12-25-25, according to the types of plants and the season at the rate of 3 lbs. per 100 gallons of water. We feed about every three weeks from spring until fall. We tried several formulas of dry fertilizers supposed to last 3 to 6 months, which would lower our cost considerably, but so far none of them could effectively replace our regular liquid feeding.

6. *Control of insects and diseases*: Control of insects and diseases in container-grown nursery stock is essentially the same as for field-grown stock. Constant control must be exercised in order to keep damages to a minimum.

The 6 points above are essential in order to produce any kind of good, saleable, container-grown nursery stock. The

following 6 points are not as important as the first for producing a saleable product but are, in my opinion, essential, when you are trying to produce a quality product.

7. *Pruning and pinching*: Plant a rooted cutting or a liner in the ground, give it enough room, keep it clean and feed it well and you have a fair chance that this plant will grow and develop more or less according to the natural habit of that particular plant. But when you plant the same rooted cutting, or the same liner, in a one-gallon can placed in a block of 500 or 5,000 and set close to each other you will not, in a great many cases, obtain a bushy, well-branched plant unless you prune it and pinch it as often as 2 or 3 times during one growing season. Pinching is one of the necessary things to do for quality, the difference between a plant grown in a container and pinched one, two, or three times during the growing season and a plant which had not been pinched is often the difference between day and night, particularly with plants such as junipers, cotoneasters, pernettyas, etc.

8. *Spacing*: Spacing is almost as important as pinching for such plants as the junipers. Without the minimum of space they require they will very rapidly lose their natural shape, which makes them attractive and bushy. It is not always possible or economical to space every plant as they should be spaced. One example in our climate is the flowering shrubs. Space them as they should be and they will be flat on the ground after every windy day.

9. *Weeding*: Weedy nursery stock is never attractive; weed-free containers do add considerably to the quality of the product. We had a weed problem from seeds blown by the wind over our block of containers. The best solution we found was to cover the surface of the potting mix in the container with a layer of approximately $\frac{1}{2}$ " to 1" of fresh sawdust. The weed seeds do not germinate in this fresh sawdust, which eventually will decompose and serve also as a mulch.

10. *Winter protection*: Depending on where the nursery stock is grown, winter protection may or may not be necessary for various species and varieties. We usually move back close together any nursery stock which has been spaced during the growing season and we cover the outside rows with sawdust up to the top of the container to protect them from heaving and freezing. We protect the more tender material such as Jap. azaleas, camellias, aucubas, abelias, etc., by moving them inside shade houses covered with plastic.

11. *Supervision*: Supervision is an important factor in the production of quality nursery stock in containers. Too much supervision may become expensive, but too little or no supervision can also prove to be very costly. In

many of the points mentioned before, supervision is almost synonymous with quality in finding out quickly, and at the right time, what has to be done, and how it has to be done.

12. *Timing*: If timing is going to play a large part in the production of quality in container stock—as it really does—it is also the big key to larger profits. If what has to be done in the production of container-grown nursery stock is not timed properly, you can be assured that quality will be reduced as well as profits. On the contrary, if everything can be done at the proper time—whether it is planting, watering, feeding, spraying or dusting, pinching, spacing, weeding, and winter protection, you can be certain to harvest both quality and profits.

MODERATOR MAIRE: Our next speaker comes to us from Washington State University at Pullman. He has been there for a couple of years in research and teaching and has been doing considerable work in the ornamental field. He has been in the nursery business all his life, most of the time in Minnesota. He is going to talk to us this morning on soil temperature in container-growing. Dr. Charles Pfeiffer:

SOIL TEMPERATURE CONDITIONS IN CONTAINER-GROWN PLANTS¹

CHARLES PFEIFFER AND ALAN PETTIBONE

Department of Horticulture and Department of Agricultural Engineering, Washington State University, Pullman, Washington

INTRODUCTION

Injury of container-grown ornamental plants often occurs during severe winters. Commercial nurserymen have long sought to prevent this loss by over-winter storage in protected areas, use of various mulches, or covering containers with polyethylene tents. Over-wintering problems have often limited the utilization of container-growing in northern climates.

Winter injury or death has been attributed to intercellular or intracellular freezing within the plant, tissue desiccation due to transpiration exceeding water absorption, a combination of these (5, 11), and the result of rapid temperature fluctuation of the tissue (9). Maximov (7) proposed that the question of temperature influence on the root needed further investigation. He postulated that plants from different ecological groups would respond differently. Later Doring (4) found woody plants with early spring leaf development and flowering were not influenced as much by soil temperature as plants with the late spring development.

¹Scientific Paper No. 3063, Washington Agricultural Experiment Station, Pullman, Washington, Project No. 1289

The assistance of Mr. Marlin Edwards for maintaining the temperature recording equipment used during this work is gratefully acknowledged.

Support of this work by Mr. Bruce Briggs, Briggs Nursery, Olympia, Washington, is gratefully acknowledged.