

GROWING BETTER MOUNTAIN LAUREL IN CONTAINERS

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INTRODUCTION

For the past decade a group has formed in the corners, halls, restaurants, and elsewhere at the Eastern Region IPPS meetings to discuss mountain laurel (*Kalmia latifolia*) propagation and production. Some of the finest nurserymen and researchers from North America and Europe have participated in these conversations. Therefore, when asked to assemble something coherent on the current state of knowledge concerning mountain laurel production for the 1989 meeting, we expected that all we would have to do was visit some of the better nurseries and we would know how to grow excellent mountain laurel. We were wrong.

During the past year we have visited nurseries growing mountain laurel in eight eastern states (hardiness Zones 5 to 8) and talked with growers throughout the country by phone. Only two nurseries were consistently producing excellent mountain laurel in containers. Nearly all of the nurserymen we visited were growing good, but less than excellent, mountain laurels in containers. By contrast, given enough time and patience, nearly all nurserymen growing mountain laurel in the field were able to produce top quality plants. All of these nurserymen have our thanks. We promised not to tell who is doing what, just share overall findings.

This paper is a selective review of container grower practices. In addition, we have referred heavily to unpublished or about to be published research by Dr. Hummel at Washington State University, Dr. Johnson, University of Georgia, and a group at N. C. State University that includes Dr. Bilderback, Dr. Shelton, Dr. Warren, and Dick Bir. We aren't even close to having all the answers for growing excellent mountain laurel consistently, but with nurserymen and researchers working together we are making progress. Mountain laurel is worth the effort.

By observing mountain laurel in the wild as well as in our gardens, we have discovered certain things. Among these are that mountain laurel does not thrive in wet or poorly drained soils, grows best in acid soils, and does not do well if heavily fertilized. If you transplant an otherwise healthy mountain laurel to the edge of a loamy, fertile

vegetable garden, it seems to slowly look worse and worse until it reaches the point where you may wish it would die. However, it usually lingers reminding you of your mistake

What does this mean when nurserymen want to grow mountain laurels in containers? Since the conditions described, other than soil fertility, are those under which we grow azaleas, it seems logical that an "azalea mix" should grow terrific mountain laurel. For two nurserymen and some researchers it is.

GROWING MEDIA

Drs. Hummel and Johnson found that they could grow mountain laurel equally well in a medium of 1:1 or 4:1 pine bark:peat in Georgia or 1:1 or 4:1 fir bark:peat in Washington. A particle size analysis of the bark used in both locations showed it to be remarkably similar. However, the fir bark contained significantly more fine particles which could result in a greater water holding capacity. Plants in Griffin, Georgia, were grown under 50% lath shade while those grown in Puyallup, Washington were grown in full sun. 'Elf' and 'Freckles' produced good plants in both locations while 'Goodrich' did not produce good plants in either location.

Media components encountered in our nursery survey included hardwood bark, pine bark, fir bark, redwood sawdust, composted hardwood leaves, composted brewery sludge, composted municipal sludge, sand, granite tailings, loamy soil, peat (at least three grades), perlite, styrofoam, and vermiculite. Samples were collected from many eastern U. S. nurseries and analyzed by the Horticultural Substrates Laboratory at N. C. State University

The most consistently excellent plants were being grown in a pine bark:peat mix. Two nurseries growing in peat:styrofoam or pine bark hardwood bark:peat:sand produced plants nearly as good. When the two media in which the best plants were being produced were compared to the two media in which the worst, but still quite good quality mountain laurel, were being grown, we found that the best plants were being grown in significantly lighter (lower bulk density) media that was more porous and had more water available to plants under normal, non-moisture stressed growing conditions (Figure 1).

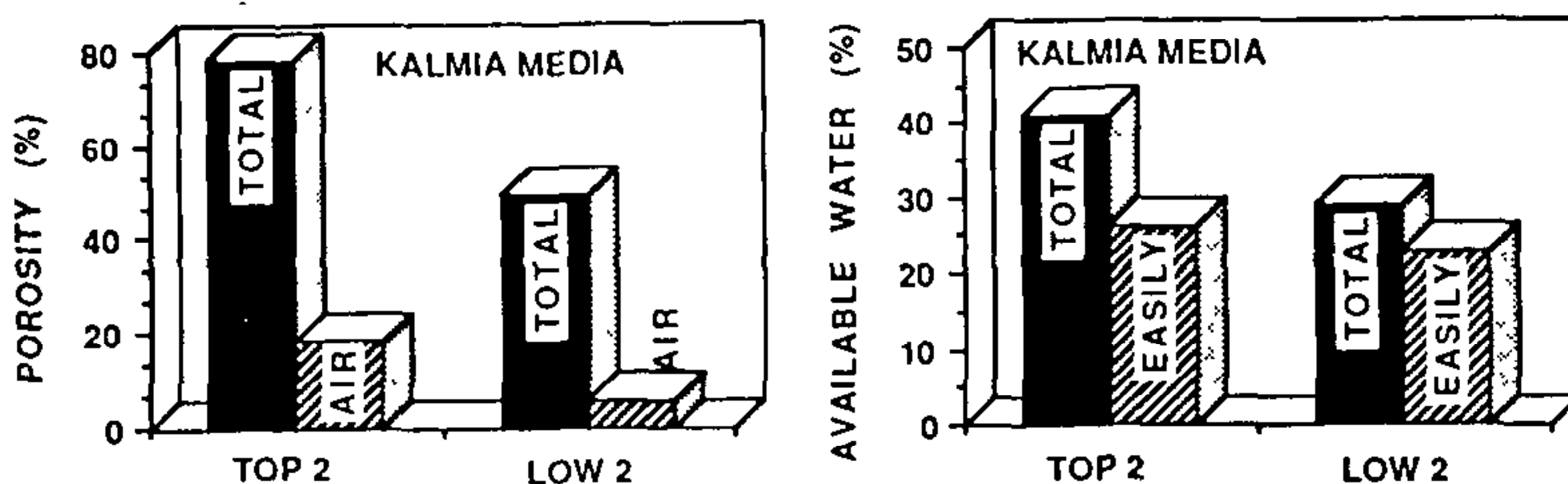


Figure 1. Porosity (left) and available water (right) from survey nurseries growing the best (top) and the poorest (low) *Kalmia latifolia*

What does this mean? Media with more pore space grew the best plants. However, plants need to have both air around the roots and water easily available. It also suggests that unless you are growing mountain laurels tall enough to blow over, sand and other mineral matter are probably costing you growth as well as money in shipping.

IRRIGATION

Two very small nurseries growing mostly seedlings were consistently producing very good plants in poorly drained mixes. We found very good plants grown in media that was neither very porous nor retained much water. Drs. Hummel and Johnson grew statistically equal plants in media that was 50% bark or 80% bark. How? They all irrigate containers only when they need it.

Irrigation management seems to be more important in producing top quality container-grown mountain laurel than having a porous media. Nurseries that were irrigating blocks of azaleas and mountain laurel equally had excellent azaleas but lesser quality mountain laurels. Mountain laurel appears to need less water, i.e., grow them drier than azaleas. Nurseries that grow mountain laurel drier than azaleas also had roots all the way to the bottom of the pot while most other nurseries did not. One grower referred to growing drier as "teasing the roots to the bottom," while those with roots only half way to the bottom of the container after a full growing season said, "it's the nature of the plant to be shallow-rooted." Whatever you call it, mountain laurel can tolerate drier conditions in the wild than some other ericaceous plants and seem to respond positively to watering less often than other plants in container nurseries. Frequency of watering, not how much water was applied was the key. When plants were irrigated, they were irrigated thoroughly.

SHADE

In the northeast or in southern mountains no shade was needed to grow good mountain laurel. However, much better container-grown mountain laurel were produced in the shade than in full sun in the Piedmont of the southeastern U.S. These plants are grown under high pine shade, 50% lath, or fabric shade. The grower with the best container mountain laurel in the southeast grows under both black and white shade cloth. Although he grows fine mountain laurel under both types of shade, those produced under white shade were more visually appealing. Part of this may be due to light quality, but some is probably due to a temperature difference. During the summer, it's cooler under white shade.

FERTILIZATION

One of the real benefits to the research done by Drs. Hummel and Johnson is that similar conditions and the same treatments were applied at opposite ends of the U.S. They found that a combination of 60% nitrate/40% ammonia nitrogen at a medium rate (80 mg N/gallon pot applied as a liquid every two weeks) gave the best growth at both locations.

Soon to be published research on container-grown mountain laurel seedlings by Dr. Warren showed that significantly more growth occurred at 100 ppm N with weekly liquid fertilization than at 50 ppm. However, 200 ppm N did not result in additional growth nor did it visibly injure these plants which were grown in 50% lath shade while those grown in Puyallup, Washington were grown in full sun. 'Elf' and 'Freckles' produced good plants in both locations while 'Goodrich' did not produce good plants in either location. this level during the heart of the growing season.

How does this translate when compared to the various production systems encountered in the survey? In 1988, the best plants I saw were grown using Scott's SREF. In 1989, the best mountain laurels I saw were grown using Scott's ProKote, at the same nursery. The next best plants were grown using Osmocote 18-6-12 or a liquid feed program, feeding weekly with about 100 ppm N. All of the best plants were being grown at levels that should result in at least 100 ppm N. The source of fertilizer doesn't appear to be as important as the rate and management.

Top quality mountain laurels can be grown whether you use a liquid-feed or slow-release fertilizer program. However, attention must also be paid to providing the plants with calcium, magnesium, and minor elements. The best plants were being grown in a pine bark:peat mix to which 5 to 7 pounds per cubic yard of dolomitic limestone was added pre-plant. Commercial minor element sources

at suggested rates seemed to last a full season except in Dr. Johnson's test where a minor element supplement had to be applied mid-season. Since it is hotter longer in Griffin, Georgia than many other places mountain laurel is grown, more irrigation water may have been used. He was also using pine bark as a primary medium component, which resulted in a pH of 4.2. Both high water use and low pH media may account for his need for additional minor elements. A medium pH range of 4.3 to 5.5 seemed to produce good mountain laurel otherwise

CULTIVARS AND PRUNING

One question asked each nurseryman concerned which cultivar they liked best in containers and which they liked worst. Every cultivar listed on the "worst" list (except 'Goodrich') also appeared on the "best" list. I attribute these differences to the growers—not to the cultivars. 'Elf' and 'Carol' were most often listed as the "best" with 'Olympic Fire' not far behind. All of the "best" chosen by growers have excellent clean, crisp foliage characteristics when grown in containers. After these three there was a list of nine, all suggested once. The new cultivars that seems to be pleasing growers most in 1989 is 'Minuet', which has leaves and habit similar to 'Elf,' but has banded flowers and is slightly less abruptly upright than 'Elf.'

'Sarah' appeared in both "best" and "worst" lists. Whenever it was in a "worst" list, the nursery seemed to fertilize more heavily than those listing it as "best". When Dr. Jaynes was asked about his cultivar, he said 'Sarah' is fertilizer-sensitive and burns easily. When not fertilized heavily, it is a beautiful foliage as well as flowering plant in full sun in the mountains of North Carolina. By contrast, 'Stillwood' drops at least half its leaves each fall regardless of the nutritional program. Much more cultivar evaluation needs to be done under widely varying environmental conditions before we can make firm landscape suggestions in different climates.

The most consistent complaint I heard from growers was related to "floppy" growth. In 1988 and 1989, this characteristic seems due to a number of factors regardless of whether the plants were tissue-culture in origin. Strange growth forms from tissue-culture plants have been discussed at IPPS, in *American Nurseryman*, and elsewhere. I can add nothing to that discussion.

Floppy growth may be due to genetics. Mountain laurels with banded flowers tend to flop more often than whites, pinks, or redbuds. Floppy growth may also be related to media. I saw a lot more flopping in pure pine bark than where peat was added to the mix. I suspect it can be caused by nutrient imbalances and growing

in too much shade as well. However, the most consistent reason for floppy plants in eastern U.S. nurseries is failure to prune plants hard when they are small. A soft pinch isn't enough. An unpruned plant 3 to 4 in. tall needs to have at least half of its height removed to get a good branching response in containers. Unfortunately, sometimes pruning doesn't work either.

CONCLUSIONS

Progress is being made in research to unlock the mysteries of mountain laurel culture. With proper management, it should be possible to provide good to excellent container-grown plants to the landscape market now. As we learn more about mountain laurel growth and the idiosyncracies of cultivar characteristics, even better plants should be available in the future.

BILL FLEMER: Is there any preference to using web bottom pots over cans with holes in the side?

RICHARD BIR: It does not make any difference as long as there is adequate drainage on the side.

PETER VERMEULEN: I have a question on the use of white versus black shade. Was there a comparison between the two?

RICHARD BIR: The best plants were under the white shade from my perception.

CHARLES HILDEBRANT: What is the white shade made from?

RICHARD BIR: A woven plastic material.