

TOP PRUNING AND ROOT GROWTH: PRACTICAL IMPLICATIONS

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Pruning is a basic and essential practice in the production of quality nursery stock. Like most production factors, pruning should be approached as a means to an end and should be manipulated like a tool chosen to accomplish a specific, predetermined goal. Indiscriminate use of pruning is a mistake. With this in mind, I would like to review some basics on why we prune, what happens when we do prune, and how these responses should be considered as we plan our production schedules.

We may prune a plant for several reasons. Most frequently we prune to increase branching. Pruning a limb temporarily reduces the auxin concentration within it and induces axillary buds to develop, producing a more dense, compact, and visually appealing plant. We may also prune to shape a plant or to control its size. We may prune out damaged or unhealthy branches. We have traditionally pruned a plant at transplanting with the expectation of improving its survivability.

All of us here understand and make use of pruning with regard to top (shoot) growth, but I suspect that many of us seldom consider the effects that pruning has on the root system. This is a mistake because the effects of shoot pruning on root growth are just as real and just as dramatic. The consequences of ignoring them can be costly.

There is no doubt that pruning actively growing plants stimulates a new flush of shoot growth. We see this every time we prune. What we do not see is that it reduces the food supply and flow of auxin to the roots, which reduces root growth and may cause the deterioration and death of some existing roots. The more severe the pruning, the greater the impact. If you doubt this, choose an established, actively growing plant and prune it severely. After two to three weeks or more compare its root system with that of an adjacent unpruned plant. The difference should be dramatic.

What does this mean? It means that after we prune we are growing a plant that is temporarily out of balance. Hormone levels, nutrients, and energy reserves within the plant have changed. Water and fertilizer uptake and usage have changed. We are supporting a lot of active new shoot growth with a reduced and less active root system. Under these conditions the plant is undoubtedly more susceptible to outside environmental and biological stresses. *Phytophthora* and other root rot diseases have an increased oppor-

tunity for infection.

This is not to suggest that pruning can be eliminated, but it does mean that we need to consider the impact pruning has on the growth, health, and production of our crops. The timing and severity of pruning should be chosen to maximize the goals of the finished plant.

We believe in the following approach: Avoid pruning at transplanting if possible so that the plant can become established before it is cut. Minimize pruning throughout the growing season, particularly during periods of stress. Choose heavily branched liners and transplants to reduce the need for subsequent pruning. Consider fungicide treatment of susceptible crops in association with pruning. Avoid pruning just prior to shipment.

These ideas are sound and make good production sense, but they do not always fit into the actual programs and schedules that we are forced to deal with. So what we do is look at each crop or block of plants individually and consider the size and type of top and root system that we want to ship within the time frame that we have to produce it. We then customize pruning, just as we do fertilization and shading, to fit each situation. For example, when we plant azaleas on schedule in early to mid-spring, we do not prune the liners until they become established in the new pots (4 to 6 weeks). We still have plenty of time to develop and shape the heads before flower bud development becomes limiting. However, if we pot our crop late we know we have less time to produce the head size required, so we focus primarily on top growth (prune immediately), recognizing that we can grow the roots in the fall. With this program we know the plants are subjected to more stress, thus we are very careful with our shading, watering, and fungicide applications, as we try to minimize stress and disease pressure.

Obviously every crop is different and should be treated individually. We try to do this, but we recognize that when we prune, whether chemically or manually, we pay a price. No matter how you look at it, pruning is expensive. Every time you cut off a branch it's like taking two steps forward and one step back. You have invested time and money to produce what you are cutting off, so there is a very real dollar value associated with labor, lost growing time, reduced size, and diminished root activity. Perhaps one day plant breeders will develop plants whose natural forms match our production goals. Until then, deciding how and when to prune is just one more part of our challenge as growers. The more we know and the more we consider the consequences, the better job we can do.