GROWERTALKS

Culture Notes

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Got Petunia Problems?

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Why does the most common crop we grow in the spring cause so many problems as we move from seed to flowering plants? Let's look at some of the ways your petunia program can fall off the tracks.

Root Running in Plugs

One of the most perplexing problems growers experience is "root running" across the surface of the cell. The seed will germinate and the root will continue to elongate without going into the soil. Eventually something changes and the root heads down into the soil or hits the edge of the cell and dies.

There are a few common reasons for this problem, listed in order of common occurrence:

Too wet on the surface. This is a tricky one to diagnosis correctly, as you seem to be doing everything right—in fact you do extra watering to make sure the soil is at a level 4 at the time of germination. Check to see if you're flooding the soil at the time of watering. Watering too slowly or with too much water causes compaction of the soil surface (crusting of surface) due to floating of the hydrophobic peat particles. These particles will float to the surface and then settle into a tight network of fiber that slows water flow through the surface the next time you water correctly. To prevent this problem, water more quickly, and with a lower-volume nozzle. Use low-volume mist nozzles with the first irrigation.

Excess soil compaction. If the surface isn't "spongy," it's probably too compact. Do a drop test of the tray and see if the soil will settle. No settling? Try dibbling. If the dibble doesn't easily form, then your soil is too compact. Adjust your flat filler and watch out for tray stacking.

Chemicals and pH. If the pH is too low (<5) you can see increased incidence of running. Likewise, if the EC is too high or there are excess additives, like wetting agents, the root "runs" away from these. Once the conditions are optimum, the root will grow downward.

The "Week 10" Problem

Every year about Week 10, growers start noticing that a percentage of the plants have distorted growing points (atrophied plants). The problem is more prevalent in vigorous varieties, affects only a percentage (<50%) of the plants in a tray, and may appear randomly from week to week. The classic diagnosis is a boron deficiency. But what if you're applying boron and still see the problem? Or you don't apply boron but still have

normal plants?

This problem is actually caused by “dead air syndrome.” This syndrome occurs when the greenhouse is tight and the humidity stays high for extended periods of time. If you walk into the greenhouse and the air feels heavy and steamy, you have dead air syndrome. A proper environment should feel “fresh,” with some air movement to encourage transpiration.

What’s happening is the high relative humidity reduces transpiration, which limits calcium and boron uptake in the plant. Technically the cause is boron deficiency, but the reason you observe the problem in some plants and not others is that there is differences in transpiration among the plants, limiting boron uptake.

Applying additional boron won’t fix the problem, but increasing ventilation will immediately eliminate new occurrences. Severely atrophied plants never develop normally. If the tip is slightly atrophied, the plant may branch below the tip and grow normally, but flowering is delayed and plants have a more bushy appearance. If you experience atrophied plants, increasing the ammonia fertilization will increase branching and make the plants salable.

Random Flowering
Petunias flower when the plants reach the correct age AND the days are long AND the nights are warm. This three-way interaction creates a lot of confusion for growers when scheduling petunia ship dates prior to May.

Plant age. Petunias need to unfold a critical leaf number before they are receptive to the long day plus warm night inductive treatment. Multiflora and grandiflora minimum leaf count appears to be four to six leaves. If the plants are not induced at this young age and then transplanted into a cool greenhouse with short days, the plants won’t flower until the days become long and the temperatures warm up. The key to early flowering is to grow the plugs to the critical leaf number and initiate the plants before moving them to cool temperatures.

Photoperiod. A photoperiod of around 10 to 11 hours is usually sufficient to induce the plants, if the night temperature is correct. This means that in most of North America the plants are at the critical photoperiod after about Week 8. Where delayed flowering occurs is when the temperature isn’t correct.

Temperature. Petunias become more receptive to long-day treatment as the night temperature increases from 65 to 75F. This is why flowering is so fast in the late spring and summer. As the night temperatures drops below 64F, the plants become progressively less sensitive to the long-day treatment. Therefore, at night temps below 64F, plants may not flower regardless of photoperiod. This explains why early plantings may not flower uniformly or are delayed.

Northern Tundra Petunia Culture
Growers in the northern areas of North America have one other handicap that southern growers seldom experience. The DLI (daily light integral) in northern areas can be as low as 3-6, while southern and coastal growers experience DLI of 10-20. Once we get to May the DLI across North America is 15+ and DLI becomes less of an issue for growers.

Research at Michigan State University showed a profound interaction between DLI and temperature on

flowering of transplanted petunias. During low-light conditions, DLI=8 and low temperature production, flowering is delayed by up to a week compared to higher DLI conditions. The research also showed that as the average daily temperature (ADT) increased by 21degrees, the days to flower drop by up to one-third!

We can clearly see that during the early spring season when the DLI is low we need to increase the expected crop time to compensate for the slower growth. Conversely, as the DLI and ADT both increase, the days to flower can drop significantly to the point where it's difficult to produce a quality plant. Although the data suggests a higher ADT could be used to overcome the lower light conditions, remember that too high of ADT can result in reduced plant quality.

Survival @ Retail
Great plants on the bench that collapse at retail are more than a disappointment. There are several things you can do to ensure sell-through of your products.

Flower collapse. If you find that your flowers collapse shortly after opening, check to see what the calcium levels are in the plants. If you have low calcium levels you can expect to see slightly smaller flowers that don't hold up.

Foliage chlorosis. You may intentionally run the petunias hungry at the end of the production period to improve plant tone or hold the plants until the market improves. This can backfire on you when the plants go to retail and then are exposed to higher light and other stresses. Without any nutrition in the soil, the plants essentially "run out of gas" and become chlorotic. To prevent this, growers will either use slow-release fertilizers or Daniels liquid to ensure a longer-term nutrient charge in the soil. Using a nitrate-based fertilizer at the end isn't effective, because as soon as someone waters the containers the nitrogen is leached out and you're back to deficient soil. The late application of a low-rate PGR can also help keep the plants green, too.

Iron chlorosis. Dark green lower foliage and bright yellow tops might look attractive to some customers, but these are generally symptoms of poor pH management or waterlogged soil. If you don't have a strong root system, the chlorosis problem can become more severe. Make sure you fertilize with a combination of nitrate and some ammonia to encourage active root growth with toned foliage.

Foliage breakdown. The rapid collapse of the foliage after moving a crop to retail shows a lack of plant tone. Excessive ammonia application will reduce tone and increase leaf collapse when plants are placed in a high-stress environment. When excess phosphorus is added to this mix, the ammonia and phosphorus make the breakdown worse.

Variety selection. Recent trials showed that there are significant differences between varieties, with some varieties exhibiting great "retail tenacity." Sometimes the best solution is to change your variety. **GT**

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