

REDISCOVERING CLEAN STOCK

MLD: Petunias are in the news again, with Tobacco mosaic virus causing them to be stunted and to show dieback, yellow veins, leaf strapping and mosaic. The cases I've seen have been ugly. This is a harsh reminder that petunias aren't your granddad's reliable crop any more; we have taken a seed-grown plant and turned it into a time bomb by propagating it vegetatively.

ARC: Seems like in our fervor to introduce new and exotic plants we have forgotten the lessons of our predecessors. They went to a lot of trouble to develop clean stock programs that were rigorously maintained and tested. Another example of a disease that has resurfaced in the past five years especially is crown gall. We have been seeing it more and more in woody plants like roses and also in herbaceous perennials. Maybe we have forgotten how bad these diseases can be when they are spread in propagation material.

MLD: I think so. I was horrified when I saw crown gall on roses in the nursery trade starting a few years ago. Even though it is a "classic" disease, we have not had to exercise damage control on it in nurseries in our lifetime because such stringent sanitation was in place at the propagator level. Rounds of trouble have come through on mums and argyranthemum and some perennials, but roses are pruned, so the opportunity for magnification of any initial problem is huge.

THE STEPS TO ESTABLISH AND MAINTAIN A CLEAN STOCK PROGRAM INCLUDE:

- Preliminary treatment such as heat therapy or meristem tip culture to free plants of bacteria, fungi and viruses.
- Culture-indexing/ELISA/PCR/nucleic acid hybridization to test stock for the presence of vascular bacteria and fungi.
- Virus indexing to test for freedom from known problem viruses.
- Mother block establishment only from proven pathogen-free plants.
- Periodic/routine/frequent testing of the mother blocks to maintain cleanliness.
- Outside lab to do the testing.
- Testing varies according to the pathogens of most concern for each crop.
- Limited access to the mother blocks.
- Limited use of fungicides and bactericides on mother blocks to avoid masking a disease.
- Annual renewal of the mother blocks.
- Exclusion of vectors with screening where appropriate (especially to protect against viruses).
- Education of workers and constant reinforcement of the importance of sanitation practices.

ARC: I also wonder how everyone simultaneously forgot about cleaning tools between plants. This was a perfect storm of forgetting that disease spreads easily in propagation and stopping all manner of sanitation at the nursery level. It is especially miserable on long-term woody crops like photinia and roses. I also have seen a number of nurseries where Agrobacterium shows up in the field plants (crown and roots) of photinia. The worst part is that these same plants are used for cuttings to start the next generation. How can we help keep this from happening again?!

MLD: I think we should call on some of the plant pathologists who were steeped in the tradition of truly clean stock, and get them to do articles in the trade press. I don't know who could convey the story on carnations, which had one of the first indexing programs, but we could ask Jane Trolinger, now of Syngenta, to explain why clean stock was and is essential for chrysanthemums, and we could ask Wendy Oglevee O'Donovan, now of Driscoll, to describe why clean stock was and is essential for geranium production. They both understand that clean stock programs are essential for long-term viability of vegetatively propagated floriculture crops. [g](#)



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