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Diseases

Diseases, particularly viral diseases, are a major problem in vegetatively propagated crops and those are almost all that we grow. Show me a plant that has been clonally propagated outdoors for three years or more and we can probably find a virus in it. Some cause obvious and harmful diseases, but many are well tolerated or even asymptomatic and may coexist within the plants indefinitely. In little-grown crops like mashua, oca, ulluco, and yacon, there are probably varieties that have been infected with viruses for decades. There has been some study of the viruses that commonly infect them in their homelands, but virtually none elsewhere. I do the best management that I can to detect and eliminate diseases in these crops, but it is a big job, particularly since nobody has really attempted it with the varieties available in the USA up until now. Even in common plants like potatoes and dahlias, nearly every new variety that I acquire is infected with at least one virus. Every year I learn a little more and get a little better, but eradicating disease from the crops that we sell is a long term process.

I now test our major crops and otherwise do my best to eliminate any varieties that are obviously and seriously sick and that have depressed yield or other symptoms that make them undesirable. The lack of any mention about disease is not an indication that the variety isn't carrying one; it just means that I don't know. We have now added a Phytosanitary Info link to the product description that lists the virus testing regimen for each crop, so you can at least see what has been tested. The crops that I currently test for diseases are potato, mashua, oca, and ulluco. Other crops will be added to that list as I figure out how to test them and what to test them for. The lack of a Phytosanitary Info tab doesn't mean that I do no testing for that crop, but rather that I don't yet have what I consider to be an adequate regimen to consider those plants virus free.

If you are concerned about viruses, the best practice would be to grow from true seeds instead of roots/tubers. I can't even guarantee you that true seeds carry no viruses, but the likelihood is much lower and we take precautionary steps with our true seeds like heat treatment and surface sterilization to reduce the risk. The growing guides each have a disease section that discusses pathogens of importance for that species and also notes which may be able to transmit through seed.

Testing Methodology

I am in the process of moving to a growing system in which I grow tubers for planting in a screen house. I perform most testing on those parent plants. If a variety has a Phytosanitary Info link, the information presented there is a record of testing performed on the parent plants. I simply replant tubers from those parent plants in the screen house as long as they continue to test clean. If any should turn up a positive result, then I can produce new plants from tissue culture to replace them. I randomly test plants in the field for certain common viruses, but I don't do comprehensive testing of field grown plants unless I see symptoms, so it is possible for varieties that we sell to pick up diseases. This way of growing is intended to substantially reduce the incidence of disease, but not to eliminate it entirely. There are some viruses that are established in our area and probably aren't possible to eliminate entirely. This is an endeavor in which we struggle against nature, but never really win. I'm seeking improvement, not perfection. There is also a major blind spot: I generally only test for viruses that I know to infect a particular species, unless I see obvious symptoms that cannot be explained by known viruses. That means I will probably never

find mild or asymptomatic viruses in species where they haven't previously been reported.

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