

Priority Research Topics



By Rick Dantzler, CRDF chief operating officer

The Citrus Research and Development Foundation (CRDF) is in the process of approving its 2021 request for proposals, which is the primary way it funds research. This is our current thinking on research priorities:

Investigation of HLB-affected trees to reduce yield loss*. Research approaches may include but are not limited to:

- 1) Understanding the mechanisms for increasing fruit retention in HLB trees by manipulating hormonal balance in the fruit and the tree or by altering the relationship between vegetative and reproductive activity with hedging and topping the canopy.
- 2) Confirm the relationship between root health (i.e., density, longevity) and fruit drop by reduction of plant stress caused by deficiency of water, nutrient, pest and/or pathogens.
- 3) Management strategies involving plant growth regulators and/or tree covers to reduce damage by foliar and root pests and pathogens in young citrus trees.
- 4) Tolerance of rootstocks to sting nematode and/or measures to reduce sting root damage to reduce losses in tree growth/production during establishment.
- 5) Develop a simple, cost effective device/method of tree injection directly into the phloem to deliver an effective dose of bactericides, biorational compounds (e.g. antimicrobial peptides) or nutrient formulations for sustainable reduction of CLas titer in bearing trees. Additional considerations may involve minimizing mechanical injury, phytotoxicity and residues in fruit or juice. Consideration will also be given to devices designed to remain in the tree for at least a 10-year period.
- 6) Develop an assay for tree response to damage by CLas infection as a measure of success of therapies for HLB control.
- 7) Utilizing an assay such as plant hairy roots (Irigoyen et al. Nature Commun. 11, 5802) or another novel assay to screen for potent peptides to prevent multiplication of CLas or induce resistance to CLas. Also, an approach could involve synthesizing hybrids between different peptides with increased antimicrobial activity or increased likelihood of regulatory acceptance. Consider the use of membrane-permeable peptides such as those being considered for medical uses to be ligated to other proteins/peptides to easily move them across membranes and enter the phloem.
- 8) Evaluate tree size controlling rootstocks in a high-density planting to enable mechanical harvesting. Determine the optimum tree density and fertilizer rate to establish fruit bearing including an economic analysis of the inputs.
- 9) Incidence of Greasy Spot (GS) rind blotch on grapefruit has become an increasing concern due to reduction in pack-out. Research should be aimed at the factors affecting control of GS rind blotch including spray volume and coverage of fruit, spray frequency and timing, fungicide mode of action, potential for fungal resistance and other pertinent variables.

*Fields trials should be conducted for at least 2 years in sites producing a harvestable crop.

I worry that all this research begins to sound the same, but please know that CRDF does its best to not fund that which has already been studied. The focus is on research that delivers answers to practical questions for growers.

Let us know your thoughts.

