EXTENSION CONNECTION

By Ajia Paolillo

Illustration by Wayne Smith

Making the most of pesticides

Pesticide applications are widely used in Florida citrus production and include insecticides, herbicides and fungicides. Pesticide materials and application costs represented approximately $500 per acre of the cultural production costs for processed oranges in Southwest Florida for the 2019–2020 season (see crec.ifas.ufl.edu/media/crecifasufledu/economics/2019_20-SW-Costs-20200818.pdf).

As growers spend this amount or more on pesticides, it is vital that the products perform well and are effective. There are many factors that could cause a pesticide application to be less than effective. Therefore, growers should consider the following factors when preparing for a treatment.

PROPER PRODUCT USE

The most important steps are to accurately identify the target pest(s) to control and to choose the correct products. The label will list the pests controlled by the product and if it is registered for use on citrus. Using a product that is not intended for management of a specific pest likely will result in wasted money and product without the desired control.

Continued use of the same pesticide or similar product with the same mode of action (MOA), can cause pest resistance. By rotating the use of different products with various MOAs, growers can mitigate pest resistance and ensure that control measures will be effective.

The label also indicates the application rate of the product that should be used. Always remember that the label is the law and must be followed accordingly. Using a rate that is less than the recommended amount is a waste of money and product, as the application will not be as effective. Applying reduced rates of pesticides may also lead to pest resistance. Applying more product than recommended increases the potential for phytotoxicity, along with negative environmental and human health risks.

CALIBRATION AND TIMING

When applying pesticides, calibrate equipment regularly and make sure it is in working order. A clogged or broken nozzle will not release the appropriate amount of product.

Timing is important when making pesticide applications. Depending on the target pest, the life cycle and/or behavior will provide guidance for the most effective timing of the application. In many cases, if the timing is not at the pest's most vulnerable or most easily controlled stage, the treatment will not be as effective.

ENVIRONMENTAL CONDITIONS

During the application, environmental conditions in the grove should be taken into consideration.

Wind can create drift, causing spray droplets to move off target. This results in less product contacting the target pest and can possibly impact more sensitive species, crops or locations.

If applications are made just prior to

a rain event, the product is more likely to be washed away and less effective.

High temperatures can cause damage to the tree or fruit through phytotoxicity.

When planning spray applications, be sure the wind speed is very low if at all, no rain is in the immediate forecast, and choose a time of day with cooler temperatures.

Applying reduced rates of pesticides may lead to pest resistance.

TEST TANK MIXES

Before applying pesticides that are part of a tank mix with other products, perform a jar test for compatibility. Ingredients in products vary by manufacturer, and it is important to do this test before applying a tank mix. Adding various products to the tank can affect the mixture's pH, cause active ingredients to come out of solution, or clog nozzles if the products do not dissolve in solution properly.

Remember to add product in the correct order to avoid these issues. For more information on the proper tank-mix order, refer to Tank-Mixing Pesticides Without Disasters (see edis.ifas.ufl.edu/pdffiles/PI/PI28500.pdf).

STORAGE AND AGE

Some other factors that can lessen the efficacy of a pesticide are poor storage conditions and age.

When storing pesticides, keep the products in a cool, dry area away from direct sunlight. This will help to keep the product from degrading and protect the storage container. If the product is stored in bags or cardboard boxes, ensure they do not become wet and break down.

After purchasing pesticides, write the purchase date on the container to keep track of how old a product is. Do not purchase large quantities of pesticides if they will not be used in a timely manner.

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Freeing the Ox From the Ditch

By Rick Dantzler, CRDF chief operating officer

"The ox is in the ditch," a Citrus Research and Development Foundation (CRDF) board member told me. "Growers need help now!"

Indeed, they do. I know it has been a tough year. Thankfully, prices have rebounded some, but with drop taking its toll and fruit quality on the edge, this has been a trying time.

My optimism for the industry is high, though, and here is why:

First, the CRDF board just approved the best request for proposals (RFP) since I have been here. RFPs are how we fund most research, and this one hits the mark. And if we don't get satisfactory proposals to answer the questions growers need answered, the board has authorized CRDF staff to pull together research teams to get the proposals we need, or even draft the proposals and put the services out to bid. This is a paradigm shift for CRDF, but one which is warranted considering the urgency of things.

Second, reforms needed in plant breeding have been identified and are being addressed. I am confident that from this point on, any plant improvement project CRDF funds will include replicated trial designs and data collection requirements that will result in a disciplined, systematic and successful march toward HLB-tolerant and resistant rootstocks and scions. A practical benefit is that the data created along the way will be of sufficient quality and quantity that growers can take it to the bank. Look for more on this in future columns.

Third, CRDF is pushing as hard as it can on peptide research, which we have identified as an area ripe with possibilities to assist growers. Our first goal is to determine which peptides work. Next, of those that work, what modality (spray, tree injection, citrus tristeza virus transfer or transgenic) is required. Let's not rule anything out because of costs at this point. The important thing is to identify *if* it works and then *how* it works. Finally, we will identify what can we do to assist in commercialization of peptides that require regulatory approval. I am convinced that peptides will become part of many successful horticultural practices over time.

Fourth, because it perceived a lack of scientific rigor in last-stage field trials of promising new rootstocks and scions, CRDF took it upon itself to do testing. It's not a decision that was made lightly because CRDF is primarily a research funding entity, but we thought the need was so great that we had no choice. And frankly, a model where breeders breed and an independent third party does the testing is not a bad model because it eliminates potential conflicts of interest. Indeed, this is how some other commodities do it.

Where this goes remains to be seen, but all the debate in the CRDF Select Committee on Plant Improvement about this might have the effect of bringing additional resources — including perhaps from CRDF — to plant breeding programs. This is good because the Florida citrus industry deserves and needs the best programs possible.

CRDF Grower Dollars at work for you

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