

Measuring Up Kontos

A look at how the insecticide with a new label fares against mealybugs, whiteflies and leafminers.

by CARLOS E. BOGRÁN

MANAGING common insect pests successfully usually involves an integration of control tactics aimed at minimizing pest immigration and reproduction in the target crop. Successful pest management also involves maximizing the impact of mortality factors that regulate pest density.

When conditions are favorable for insect colonization and development and mortality by weather and natural enemies is low, applications of insecticides may be necessary to minimize crop damage. Whiteflies, mealybugs and leafminers are among the most challenging pests to control. Problems with these pests often start when propagules – usually the less conspicuous and most easily transported life stage of the species – are introduced into the crop.

Whitefly, mealybug and leafminer eggs and early instars are very difficult to

Figure 1. Mealybug counts on potted 'Miramar' chrysanthemums at seven days (A) and 14 days (B) after treatment with spirotetramat formulations.

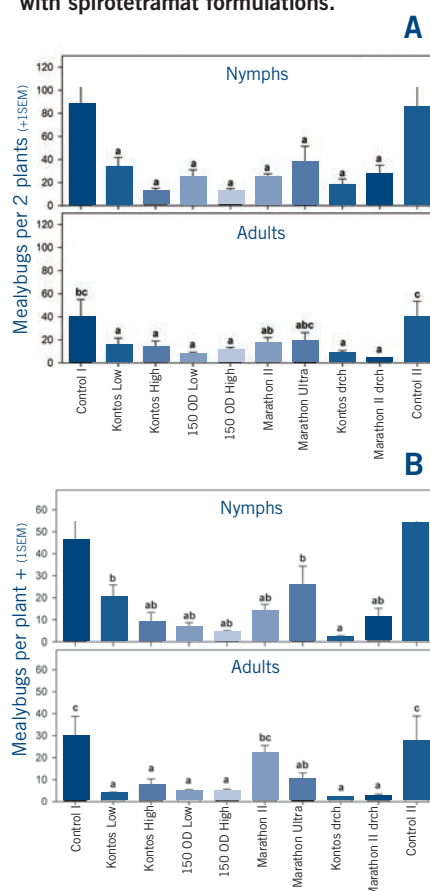
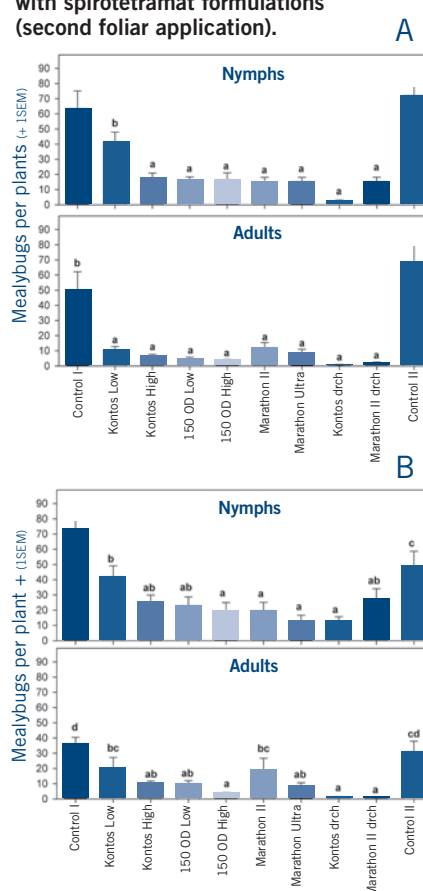


Figure 2. Mealybug counts on potted 'Miramar' chrysanthemums at seven days (A) and 14 days (B) after treatment with spirotetramat formulations (second foliar application).



Footnote (Figures 1-2)

Bars with the same letters are not significantly different. Pretreatment counts revealed no differences among treatments at application day before. Control plants received no applications. Note: drch = drench applications.

New Label

The Kontos specimen label has recently been altered to include the following:

- Control of immature stages of thrips;
- Drench and foliar spray labeling for outdoor applications at 1.7 to 3.4 fluid ounces per 100 gallons of water; and
- Removal of aerial application

detect by routine inspection due to their small size and secluded behavior. Once established, populations of these insects can quickly reach unacceptable levels triggering insecticide applications.

Fortunately, several new insecticides such as spirotetramat (Kontos) are now

on the market that more effectively target these pest species and more easily integrate into modern pest management programs.

Why Such Damaging Pests?

Whiteflies, mealybugs and scale insects feed by piercing the leaf or stem and suck-

ing the plant's sap or cellular contents. As a byproduct of their feeding, many of these insects cover themselves with a waxy substance that protects them from desiccation and from many contact insecticides. Similarly, leafminer larvae are protected from most contact sprays as they feed inside the leaf tissue and complete development in the soil, away from sprayed plant surfaces.

Controlling established populations of these pests often requires the timely use of systemic insecticides. Systemic insecticides are incorporated by the plant after application and move from treated surfaces to untreated ones, thus providing better coverage than contact sprays. Whether or not an insecticide moves within the plant and the speed at which it moves is based on both the chemical and physical properties of the molecule and the size (and transporting mechanism) of the plant. Most of the new systemic insecticide molecules can move acropetally (toward the tips of the plant) via the xylem. But, often because they are highly water soluble, the molecules do not effectively move basipetally (toward the base of the plant) in the phloem.

Spirotetramat is a true systemic insecticide. Once in the plant, it converts to spirotetramat-enol, a molecule with a good combination of characteristics for phloem mobility. Even though the compound is not very water soluble, it is a weak acid with intermediate lipophilicity (membrane permeability), which allows it to slowly diffuse through, accumulate into and get moved by the phloem cells.

The information that follows is a summary of tests conducted in the last three years to assess efficacy of Kontos against whiteflies, serpentine leafminers and solanum mealybugs attacking flowering plants commonly grown in greenhouses.

Mealybug Control Using Kontos

Using mealybug-infested 'Miramar' chrysanthemums, we tested efficacy of two formulations of spirotetramat (240 SC and 150 OD) at two doses each (high and low) corresponding to 1.7 and 3.4 fluid ounces per 100 gallons for 240 SC, and 2.7 and 5.4 fluid ounces per 100 gallons for 150 OD, to that of Marathon II (imidacloprid) at 1.7

fluid ounces per 100 gallons and Marathon Ultra at 25 fluid ounces per 100 gallons – all as foliar sprays applied 14 days apart.

We also tested drench treatments (one application) of the 240 SC low rate and Marathon II at 1.7 fluid ounces per 100 gallons. Control plants received no applications. All spirotetramat formulations performed well against both nymphs and adults, relative to imidacloprid formulations, but control was better at two weeks after treatment (Figure 1). This is expected based on the chemical properties of the spirotetramat molecule. Results were similar after the second foliar application but surprisingly, the drench treatment continued to work well 28 days after application (Figure 2).

Whitefly Control Using Kontos

Using whitefly-infested 'Freedom Red' poinsettias, we tested efficacy of spirotetramat (BYI08330) drench applications at 0.85, 1.7, 2.5 and 3.4 fluid ounces per 1,000 pots (6 inch) to that of Safari (dinotefuran) at 24 ounces per 100 gallons. We also compared foliar applications (two applications 14 days apart) of spirotetramat (BYI08330) at 1.7 and 3.4 fluid ounces per 100 gallons to that of TriStar (acetamiprid) at 2.3 ounces per 100 gallons. Control plants received no applications.

Both drench and foliar applications of spirotetramat performed well relative to Safari and Tristar but residual activity was longer when spirotetramat was applied as a drench (Figure 3). Drench applications continued to show activity on whitefly nymphs even five weeks after treatment.

Leafminer Control Using Kontos

We tested efficacy of Kontos against leafminers on potted 'Miramar' chrysan-

themums under two conditions. On the first test, we infested plants one day after insecticide application. On the second test, we infested plants three days before insecticide applications to determine protection and residual activity.

We tested efficacy of Kontos drench applications at 0.05, 0.075 and 0.1 milliliter per liter of soil-media to that of Flagship (thiamethoxam) at 113 grams per 100 gallons. We also compared foliar applications of Kontos at 1.7, 2.5 and 3.4 fluid ounces per 100 gallons to that of Avid (abamectin) at 4 ounces per 100 gallons. Control plants received no applications.

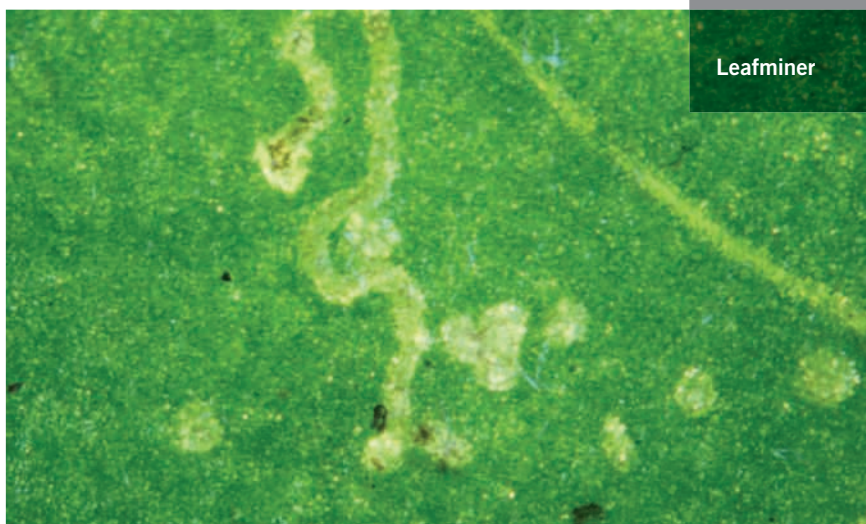
As expected, leafminer control was faster when the insecticides were applied the day before infestation. Drench treatments also performed better than foliar applications and provided longer residual activity.

Takeaways

The efficacy of Kontos compared well with that of several products against a variety of insect pests, including mealybugs, whiteflies and leafminers. Based on its efficacy and novel mode of action, Kontos is a great tool for insecticide resistance mitigation and management of these important pests.

Insect control by Kontos is slow but long lasting. It is best used against small populations before damage occurs and may not be a good option for rescue treatments when pest populations are already high. Based on the research, Kontos is best used as part of an integrated pest management program that includes monitoring to detect small to moderate population densities. **GG**

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Leafminer

Figure 3. Mean number of *Bemisia tabaci* nymphs per 'Freedom Red' poinsettia plant during the seven-week experiment evaluating effectiveness of drench (A) and foliar (B) insecticide treatments. Note: D = drench treatments; S = spray treatments.

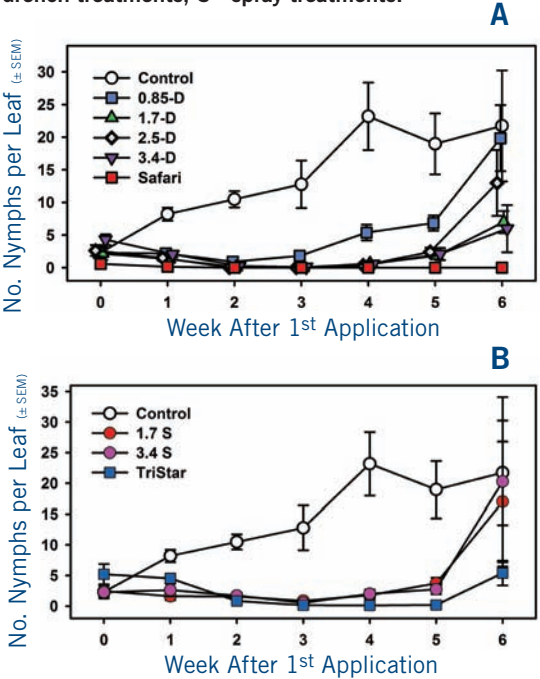
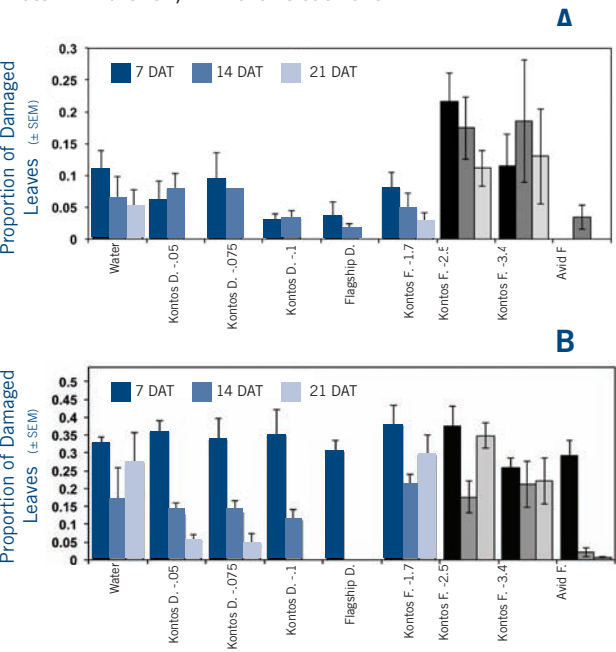


Figure 4. Mean proportion of damaged 'Miramar' chrysanthemums leaves at seven to 21 days after treatment with insecticides to control leafminers. In test A, two adult flies per plant were released at one day after application. In test B, two adult flies per plant were released at three days before application. Note: D = drench; F = foliar treatment.



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