



Whiteflies in Arizona: Neo, Neo, Neo... Nicotinoid!

A guide for PCAs and other Pest Managers interested in whitefly control in cotton

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Sounds like a bad nursery rhyme! But as hard as it is to say ten times fast, this is one group of insecticides that you should take note of for today and the future. As pest managers, many of you may remember chlorinated hydrocarbons, organophosphates, and carbamates. But do you realize that the last time a major group of insecticides was discovered and deployed broadly for insect control was the pyrethroids over 20 years ago! So when a new class of chemistry with broad applicability to production agriculture is developed, you should take notice. Further, you should take notice of all that we have learned from previous experience with new classes of chemistry, and all the **new, unbiased, and objective** information that we have to offer regarding their usage.

Recently, in collaboration with the Arizona Crop Protection Association, Arizona Cot-

ton Growers Association, Cotton Incorporated, and Western Growers Association, the University developed important new guidelines for the usage of this new class of chemistry in multiple crops including cotton. This bulletin is available either from your local county office or on-line at ACIS (<http://cals.arizona.edu/pubs/insects/az1319.pdf>). Ask for:

“Cross-commodity Guidelines for Neonicotinoid Insecticides in Arizona”, IPM Series No. 17, by J.C. Palumbo, P.C. Ellsworth, T.J. Dennehy, and R.L. Nichols.

So what products are we talking about? Anything that contains acetamiprid, imidacloprid, or thiamethoxam. Imidacloprid is found in the familiar products Admire®, Provado®, and Leverage®, as well as the seed treatment, Gaucho®. Thiamethoxam is found in recently registered

products like Actara®, Centric®, Platinum®, and the seed treatment, Cruiser®. Acetamiprid is the most recent active ingredient to be developed and may be found in Intruder® and Assail®.

Which neonicotinoids are registered in cotton? Let’s focus just on the cotton foliar insecticides Provado and Leverage, Centric, and Intruder. These are your neonicotinoid tools for controlling whiteflies, aphids, and perhaps other occasional pests. Each neonicotinoid is distinct and has attributes that dictate when and how it should be best used (see table below).

O.k., so how should they be used in cotton? These new industry-endorsed guidelines outline specific limits on their usage. Yes, limits! There’s no sense in sugarcoating it. If we are to have the reasonable expectation of having new chemical tools

Suggested Rates, Expected Control Intervals, and Strategic Fits for Neonicotinoid and Other Insecticides Registered in AZ for Whitefly Control in Cotton

IRM Stage	Active Ingredient	Product Name	Optimal Rate	Control Interval	Strategic Fit
Stage I: Insect Growth Regulators	buprofezin	Courier	8 oz	25–42 days	As the first spray against whiteflies for long-term control and bioresidual as a result of excellent selectivity and safety towards beneficials; appropriate up to 30 days before green-leaf drop
	pyriproxyfen	Knack	8 oz	25–42 days	As the first spray against whiteflies for long-term control and bioresidual as a result of excellent selectivity and safety towards beneficials; appropriate up to 30 days before green-leaf drop
Stage II: Non-Pyrethroids	acetamiprid	Intruder	2.3 oz	14–28 days	After an early IGR for moderate to long-term control; instead of IGR when thresholds are reached late in the season (less than 30 days to green-leaf drop); or before an IGR in Cotton / Melon communities for adult control of mass migrations; good selectivity and safety towards beneficials
	imidacloprid	Provado	N/R	4–6 days	N/R
	imidacloprid + cyfluthrin	Leverage	N/R	4–6 days	N/R
	thiamethoxam	Centric	2 oz	7–14 days	After an early IGR for short-term control; moderate to good selectivity and safety towards beneficials
	Other Non-Pyrethroids	various	various	5–10 days	After an early IGR for short-term, yet broad spectrum, control; fair, but variable, selectivity and safety towards beneficials
Stage III: Pyrethroid Combinations	Pyrethroid combinations	various	various	7–14 days	As a late season, broad spectrum, "clean-up" spray with short residual and control of other pests; poor selectivity and safety towards beneficials

N/R, Not Recommended for control of whiteflies in cotton; Neonicotinoids should not be used in cotton grown in Multi-Crop communities.

work for us near- and long-term, the agricultural community, and pest managers specifically, need to adhere to voluntary constraints on the usage of this very valuable class of chemistry. In the shortest terms, this means using the neonicotinoid class no more than two times per year in each **cropping community** (see IPM No. 17; see table on this page).

What's the deal with these cropping communities? Arizona contains local agricultural communities that can be classified as “**Multi-Crop**”, “**Cotton / Melon**”, or “**Cotton-Intensive**”, at least with respect to whitefly treated hosts and neonicotinoids. It is important to realize that these communities can and do exist wherever the crops that define them (i.e., melons, vegetables, cotton) are grown in close proximity, say **within 2 miles of each other**. So if your cotton fields sit among nothing but cotton for miles around, then you can follow the “Cotton-Intensive” model for using neonicotinoids. If, however, there are spring and/or fall melons nearby, you should follow the “Cotton / Melon” guidelines, and so on.

So what does this mean to me, as a PCA or pest manager / grower of cotton? It means that if you are growing in an area that lacks any melons or vegetables for miles around, you can use up to two, non-consecutive, neonicotinoids in your cotton crop.

But should I? It depends! We know that all situations are not the same; however, we have a vast storehouse of information now on how to best manage whiteflies in Arizona. Don't ignore what we already know. Our **best and most economical strategy** is to follow the plan that has worked so well for so many years. In cotton, that means using the insect growth regulators (IGRs) first in Stage I of our management plan. Use them in the best way possible: at their recommended rates, without mixing with other whitefly insecticides, and according to research-proven thresholds (40% of leaves infested with 3 or more adults plus 40% of leaf disks infested with 1 or more large nymphs).

Yeah, but I like to hold my IGRs in reserve. I need to get out to a certain date before I use them. You've missed the point and the

power of the IGRs. The decision to use IGRs is actually easier when thresholds are reached relatively early in the season, say 6 weeks before the end of the season. They'll pay you dividends in **long-lasting suppression**

and extra bioresidual by preserving beneficials that will help in the control of all insect pests. **Use IGRs first!** (except when the need for whitefly control is very short) (see table on pg. 1).

So where do the neonicotinoids fit it? They fit perfectly in the Stage II (non-pyrethroids) position **following an IGR**, if necessary, though there may be unusual exceptions (see IPM No. 17).

But I want to try them first! And the sales guy tells me, that's where they'll work best! O.k., then let's consider what they can do for you. Centric is a short residual foliar neonicotinoid that could provide you up to 7–14 days of control. While more selective than say a pyrethroid combination (Stage III), Centric is not nearly as “soft” on beneficials as either of the IGRs. So if you reach threshold in July or even early August, Centric is a solution that will require 1 or more follow-up sprays. In other words, you have a very **low probability** of getting through your season with just one Centric spray. We do not recommend Provado or Leverage for whitefly control in cotton.

But what about this new one I've heard so much about? Intruder? I tried it last year on a field and it looked good! And it is good. It, too, is a foliar product with translaminar action, and if used at the full whitefly rate (as it should), you might expect up to 14–28 days control. So once again, an early spray, say in July for Central Arizona, you have only a low probability of getting through the season with just one spray. On the other hand, time and time again, the IGRs, either Courier or Knack, have had the ability to provide control intervals in excess of 30 days, and for many, season-long protection. So use the IGRs first (Stage I), **follow-up with a neonicotinoid** (Stage II), if needed, and clean-up very late in the season with

Summary Guidelines: Maximum number of uses per crop season for neonicotinoids in three different cropping communities.

Community	Cotton	Melons	Vegetables
Multi-Crop	0	1*	1**
Cotton / Melon	1	1*	—
Cotton-Intensive	2	—	—

*Soil only; **Soil or Foliar

broad-spectrum pyrethroid combinations (Stage III), if necessary (see table, pg.1).

Hold on, not so fast. I see on the label of these new neonicotinoids that they either control or suppress plant bugs. If I use them early, maybe I'll get some Lygus control benefits. I wish this were true. For 10 years, we have been screening insecticides, new and old, for efficacy against our desert Lygus. We have evaluated Centric and Intruder several times, as well as newer and older neonicotinoids. They are not providing economic protection against Lygus, plain and simple. **Don't use these products thinking you will receive collateral benefits in Lygus control.** Think of your gun as loaded with three bullets, all aimed squarely at whiteflies: Courier, Knack, and an effective use of a neonicotinoid. We all hope to take whiteflies out of the picture with just one shot, and with any luck, you'll have fields like this; however, it is also good to know that you have a couple rounds left in the chamber, if needed! Happy hunting.

So what if I am growing cotton near melons, or both vegetables and melons are in the area? Your access to neonicotinoids in cotton is further limited. Please see the full bulletin, “*Cross-commodity Guidelines for Neonicotinoid Insecticides in Arizona*”, provided to you in previous mailings for further details (see table on this page).



This and other documents of interest relating to crop production / protection are available on the Arizona Crop Information Site at <http://cals.arizona.edu/crops>

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