



Silverleaf Whitefly Sampling Plans in Cotton

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General Sampling:

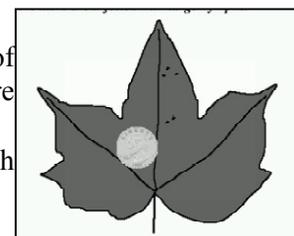
- Sample greater than 50 feet from the field edge.
- Avoid sampling plants being sweep sampled.
- For adults, sampling in the morning is suggested particularly in mid-summer. Identify species (do not treat for greenhouse or banded wing whiteflies)
- Count only silverleaf whitefly, *Bemisia argentifolii*
- Sampling unit: 5th main stem leaf from the terminal
- Sample at least 30 leaves at random in several different locations

Adult Presence/Absence sampling plan¹ for decision making:

- Turn leaves and locate whiteflies (keep shadow off the plant)
- 3 adults per leaf equals an infested leaf
- After sampling leaves, calculate the percentage of infested leaves: % infested = number of infested leaves / 30 (number of leaves sampled) X 100
- Thresholds: 40% infested leaves equals 3 adults per leaf (IGR threshold), 57% infested leaves equals 5 adults per leaf.
- Field edges and centers may be treated as separate sampling units

Nymph Presence/Absence sampling plan² for decision making:

- Nymphs are necessary for the proper use of IGRs
- Wedge the leaf disk between the central and left-side main veins. Leaf disk = size of quarter. If any large nymphs are present (3rd and 4th instars) within the leaf disk, score leaf as infested
- The treatment threshold for IGRs is 40% infested leaves, corresponding to 1 large nymph per leaf.



Using IGRs when both adults and nymphs are present

- The 40/40 Table was devised for use when 40% of the leaves are infested with both adults and nymphs
- Choice of IGR or insecticide depends on the combination of adults and nymphs

40/40 Decision Table³

IGR Threshold Decision Matrix		Adult Levels	
		Fewer 3/leaf	At least 3/leaf (40%)
Large Nymph Levels	Fewer than 1/disk	No Action Resample in 3 days	Wait resample in 3 days or Apply Situation II Insecticide or Apply Knack
	At least 1/disk (40%)	Wait, resample in 3 days or apply Courier	Use either IGR



¹ From: Arizona Guidelines (IPM Series No.2) Naranjo, Ellsworth, Diehl, Dennehy

² From: Arizona Guidelines (IPM Series No. 6) Naranjo, Ellsworth, Diehl.

³ From: Ellsworth and Martinez-Carillo. 2001. IPM for *Bemisia tabaci*. Crop Protection: 20:853-869.

The **Insect Growth Regulators (IGRs)**⁴ are an integral component of whitefly management in the San Joaquin Valley. Some general properties of these materials are outlined below:

Knack - pyriproxyfen

- metamorphosis inhibitor, juvenoid
- activity @ pupation
- affects embryogenesis
- sterilization of adults
- translaminar activity (local movement into the leaf)

Courier – buprofezin

- chitin synthesis inhibitor
- activity @ each molt
- vapor phase activity

Situation I: Initial (internal) buildup

IGRs: KNACK & COURIER

Action Threshold: 3 Adults/leaf (= 40% infested) **AND** 1 Nymph/leaf disk (=40% infested). See 40/40 Table (previous page) for options.

Benefits: Good residual control, selective, minimal disruption of natural enemies.

Special Concerns: IGRs do not provide quick knockdown, are most effective when all stages are present and populations are beginning to increase. Use only one application of each IGR per season. Slower acting, activity may take 7 days

⁴ Note: both materials act mainly on the immature stages therefore, nymphs should be present prior to treatment.

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Situation II: Gradual Invasion by Adults⁵
NON-PYRETHROIDS

(Examples: Endosulfan, Curacron, Provado, Centric, Assail)

Action Threshold: 5 Adults/leaf (57% infested leaves)

Benefits: some products less disruptive to natural enemies, some adult knockdown, some control of other pests present (lygus, aphids).

Special Concerns: Limit the use of any one pesticide class, follow label prohibitions on feeding trash and exposure to open lint)

Situation III: Heavy Migration
PYRETHROIDS + NON-PYRETHROIDS

Action Threshold: 5 Adults/leaf

Benefits: Quick knockdown of adults, good to control hot spots.

Special Concerns: Early use significantly impacts natural enemies early use may also increase resistance and reduce effectiveness later in the season when protection of lint is a must.

Useful Resources⁶

- Pest Management Guidelines
www.ipm.ucdavis.edu
- Whitefly page www.uckac.edu/whitefly
- <http://cottoninfo.ucdavis.edu>
- Sticky Cotton Sources & Solutions
- Management of Silverleaf Whitefly
- Whiteflies in CA
- Arizona information
<http://ag.arizona.edu/crops/cotton/insects>



⁵ Whenever possible ground applications are recommended

⁶ Contact local Farm Advisor or Pete Goodell (559/646-6515) for copies