

# 2024 SILVERLEAF WHITEFLY SAMPLING & THRESHOLDS



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FACT SHEET MARCH 2024

## INTRODUCTION

Rapid population growth of silverleaf whitefly (SLW) can occur from mid-season onwards, particularly when natural enemies have been disrupted by insecticides.

To reduce the amount of time required and help make SLW management more efficient, the recommendations for SLW sampling and thresholds have been simplified.

## SAMPLING PROTOCOL

Start sampling during early flowering (750 DD 15\_32) to identify a SLW population baseline for comparison as the season progresses.

Avoid field edges and take sufficient samples to represent the field (30 leaves or more).

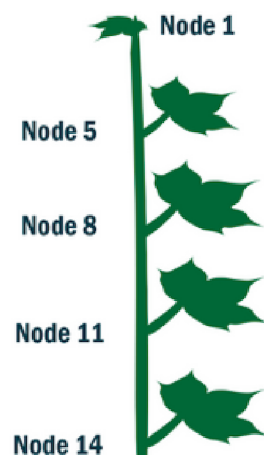
Sample plants at least several metres apart. Take one main stem leaf per plant from the mid canopy (11-14 nodes down from the terminal) and look for large nymphs (3rd or 4th instar) on the underside of the leaf. If two or more are present, the leaf is considered infested.

Calculate the proportion of infested leaves and consult the threshold matrix to see your risk area in relation to the DD crop development stage.

- If in the 'Low risk' zone, no immediate action is needed. Continue to monitor the situation.
- If in the 'Moderate risk' zone, assess the counts over 2-3 consecutive checks. If the population is increasing a control decision is likely.
- If in the 'High risk' zone mid-flowering (after about 800 DD), management action is required.

The critical control period is from mid flowering to open cotton or about 800-1050 Day Degrees (15\_32 system) with the objective of having the resident population in check by the time lint is exposed.

*Note: this method only applies to in-crop population build-up and is not applicable if crops experience mass immigration of adults from nearby defoliated areas.*



**Handy hint:**  
Viewed from above, nodes 5, 8, 11 and 14 are opposite the first unfurling terminal leaf.



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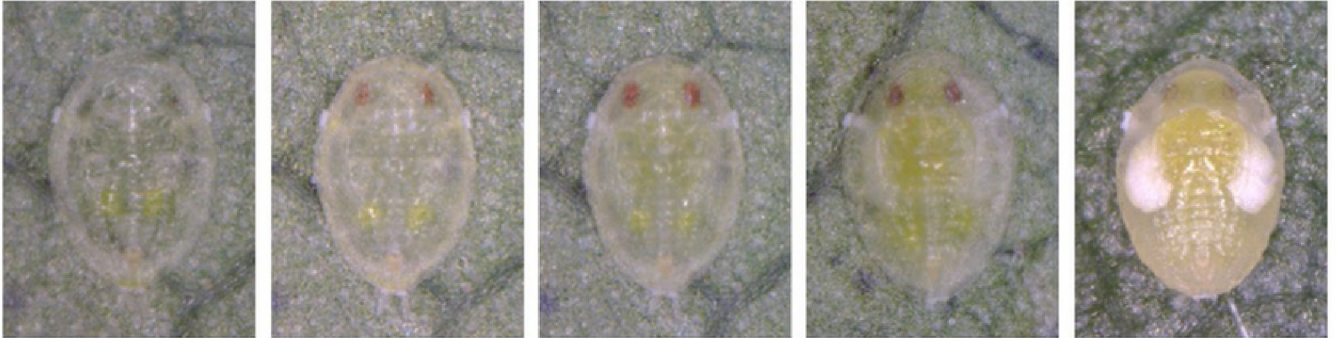


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**SLW nymphs are relatively transparent before developing obvious red eyes during the fourth instar stage. Wing buds become visible just before the adult emerges**

Consider natural enemy conservation when making control decisions. Nymph mortality generally increases from cut-out onwards or after a SLW insecticide has been used.

Nymph viability during sampling should be assessed from cut-out onwards as mortality from parasitism, predation or an applied insecticide is an important factor when determining future management decisions, particularly during the open boll phase.

While parasitism levels have not been specifically included in this threshold, they can provide a general indication as to future nymph density trends particularly after crop cutout. In most fields extensively sampled over a 4-year period, *Eretmocerus* was found to have a controlling impact on whitefly populations from first open boll onwards.

Prior to first open boll parasitism is often very low, but if undisturbed by pesticides will go on to build up quickly.

Prior to first open boll parasitism often lags behind the increase in SLW population. However, it remains particularly important to conserve natural enemies during this period when SLW control is required with IGR products (pyriproxyfen & buprofezin) having an ideal fit, with limited impact on parasitoids and many predators.

IGR use will leave a reduced SLW population with natural enemies largely intact.

Consider your timing carefully as there are limitations on the number of sprays per season of these products.

The activity of parasitoids and other natural enemies is usually sufficient for the remainder of the season whilst bolls are opening to prevent SLW population rebounding.

It is recommended that nymph viability be actively monitored from crop cut-out onwards.

Distinguishing healthy from parasitised or dead nymphs requires magnification and experience but a new nymph viability app for smart phones has been released for testing (Jan 2024) that can be used to quickly assess nymph status with 80-85% accuracy.

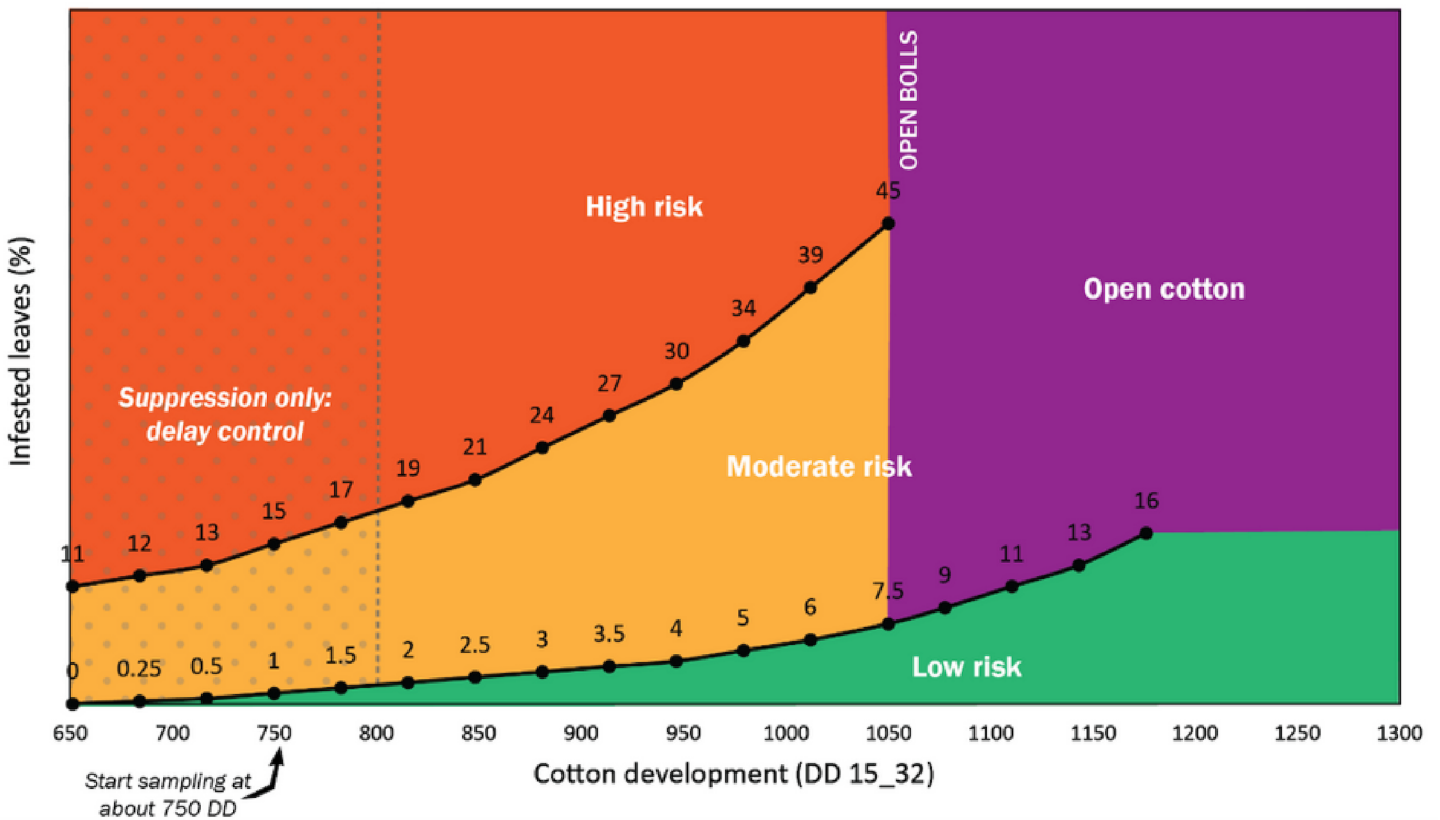
Search for the CottonInfo YouTube video **Identifying parasitism in silverleaf whitefly** to see DAF entomologist Jamie Hopkinson demonstrate how to use a digital microscope to identify signs of parasitoid activity in silverleaf whitefly populations:  
<https://youtu.be/SO0cedrGIQI>

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## THE MANAGEMENT MATRIX 2024



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## AN EXPLANATION OF THE MATRIX ZONES

Crop stage	Sampling considerations and management actions		
<p><b>Early to mid flowering (prior to 800 DD)</b></p>	<p>Monitor populations but do not spray for SLW. Preserve beneficials to keep pest populations low. Consider opportunities to suppress SLW if the need arises to control other pests, particularly prior to row closure. Prioritise selective/soft products if any spraying is undertaken.</p>		
<p><b>Mid-flowering to first open bolls (800-1050 DD)</b></p>	<p><b>Zones</b></p>		
	<p><b>Low risk:</b> Insecticide use is unlikely to be required for SLW in fields with low population densities. Continue to consider opportunities for suppression if the need to control other pests arises. Due to inherent variability associated with sampling, one or two data points slightly above the low zone boundary does not constitute a 'breakout'. Continue to sample population development and preserve beneficials.</p>	<p><b>Moderate risk:</b> If population density is increasing for 2-3 consecutive checks (over 7-10 days) consider undertaking control action. At 800-1000 DD, a slower acting insect growth regulator (IGR) product is an appropriate choice, with low impact on beneficial insects that can continue to exert biological control well after insecticide residue efficacy has degraded. If the crop is nearing open bolls, a faster acting insecticide would be more appropriate. A follow up treatment may be necessary during later boll opening if natural enemies are disrupted and SLW populations recover. Actively preserve beneficials that will assist keeping SLW populations low.</p>	<p><b>High risk:</b> A population that breaches the high risk zone for 2 consecutive checks (over 5-7 days) represents an unambiguous control scenario. Even with high numbers, there is enough time to act before lint contamination. Use slower acting products such as IGRs prior to 1000 DD. Applying IGRs prior to canopy closure will assist spray penetration and control efficacy. If the crop is nearing open boll, or has a dense closed canopy, a faster-acting systemic product may be more appropriate.</p>
<p><b>Open cotton (1050 + DD)</b></p>	<p>Continue monitoring SLW nymphs whilst also assessing nymph survival (e.g. parasitism). Also check for presence of honeydew in the lower canopy. Contamination risk should remain low but consider factors such as the influence of dry conditions or delays to crop defoliation.</p>	<p>For populations above low risk, there is a continuing potential for open boll honeydew contamination. Continue monitoring SLW nymphs and importantly assess nymph viability as mortality due to parasitism and predation typically increases after cutout. Nymph populations may be less than 50% viable. Base management decisions on monitoring viable SLW nymph numbers, severity of honeydew on lower canopy, and climatic conditions (e.g. dry conditions can exacerbate lint contamination risk). The primary objective is to avoid or salvage sticky cotton. Focus on knockdown products if control is required. Displaced populations of adults from neighbouring defoliated cotton can also pose a honeydew contamination risk in later maturing crops and require control.</p>	

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## REGISTERED INSECTICIDES FOR THE CONTROL OF SILVERLEAF WHITEFLY

Insecticide (MOA Group) Formulation and rate	Impact on natural enemies	Control Interval <sup>1</sup>	Max sprays	Resistance status	Comments <sup>2</sup>
Paraffinic oil 778 g/L EC   792 g/L SC @ 2% V/V (min 2L per sprayed ha)	very low			Unknown	Most effective when targeting low, early season populations. Apply in a minimum of 100 L/ha for ground applications. Multiple applications are more effective.
Pyriproxyfen (7C) 100 g/L SC & EC @ 0.5 L/ha	very low	14-30	1 (within 30 day regional window)	Widespread – low to moderate	Ensure thorough coverage. An IGR with translaminar movement that disrupts egg hatch, and moulting from 4th instar nymph to adult. Adult female fertility is reduced by contact with pyriproxyfen.
Clitoria tematea extract 400 g/L EC @ 2L/ha	Low		5	Unknown	Apply as indicated by field checks and pest presence. Ensure good coverage. Treatment effects may not be seen for 3 or more days. A repeat application may be required at 14-20 days if conditions favour pest development.
Buprofezin (16) 440 g/L SC @ 1L/ha	Low	14-30	1 (targeting SLW)	Not detected	An IGR that disrupts moulting of nymphs has contact, vapour and limited translaminar activity. Reduces adult female fertility.
Diafenthiuron (12A) 500 g/L SC @ 0.6 or 0.8 L/ha	Low	7-14	2	Not Detected	Suppression of whitefly. Target early developing populations (may not give satisfactory control on established populations). Has translaminar movement, contact and vapour activity. Activated by UV light and insect metabolic processes.
Afidopyropen (9D) 100 g/L DC @ 0.35 L/ha + 0.2% v/v Hasten Spray Adjuvant	Low	14-21	2 (targeting SLW)	Not Detected	Provides suppression of whitefly adult and nymphs, best targeted at nymph stage. Has translaminar movement and acropetal mobility.
Dimpropridaz (36) 120 g/L (SL) @ 1L/ha	Moderate	14-21	2 (targeting SLW)	Unknown	Disrupts insect behaviour, coordination and feeding. Provides slow knockdown. Systemic, oral and contact activity.
Cyantraniliprole (28) 100 g/L SE @ 0.6 L/ha + oil	Moderate	14-30	2	Not Detected	Target early developing populations. Two consecutive applications of cyantraniliprole 10-15 days apart may be required.
Spirotetramat (23) 240 g/L SC @ 0.3-0.4 L/ha + Hasten Spray Adjuvant 1.0 L/ha	Moderate	14-30	1 (targeting SLW)	Widespread – low (moderate in some regions)	Use higher rate when targeting high pest populations and when crop is well advanced. Do not reapply within 14 days. Has translaminar and systemic mobility in both phloem and xylem. Controls nymphs and reduces fertility in female whitefly.
Acetamiprid (4A) 200 g/L (SL) @ 0.225-0.38 L/ha	Moderate	7-14	2	Rare – low	Use higher rate when conditions favour a rapid increase in whitefly populations, for longer residual control and when crops are well advanced. Acetamiprid has translaminar movement and acropetal mobility.
Emamectin benzoate/ acetamiprid, (6/4A) 32.5g/L/218g/L DC @ 0.3-0.35 L/ha	Moderate	7-14	2	Not detected/Rare-low	Target developing populations. Use an insecticide from another MoA between applications. Acetamiprid has translaminar movement and acropetal mobility. Emamectin benzoate has translaminar movement.

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## REGISTERED INSECTICIDES FOR THE CONTROL OF SILVERLEAF WHITEFLY (CONT'D)

Dinotefuran (4A) 200 g/kg WG @ 250-375g/ha	Moderate	7-14	2	Not Detected	Target developing populations, use higher rate if targeting high pest populations, and use an insecticide from another MoA between applications Has translaminar movement and systemic mobility.
Bifenthrin (3A) 100/250 g/L EC   240 g/L SC @ 0.8/0.32 L/ha   0.33 L/ha	Very High	7-14	1	Widespread – low Cross-resistance with other SPs	The adult stage should be targeted. Do not spray crops with a high population of the juvenile stages. Thorough coverage of the crop canopy is essential.

1 control interval – dependent on rate, timing, immigration and pressure, activity of natural enemies

2 Insecticide translocation: translaminar = movement through leaf from upper to lower surface; acropetal – base to apex movement within plant

*Disclaimer: Information on insecticides is a guide only. All pesticide applications must accord with the currently registered label for that particular pesticide, crop, pest and region. See label for instructions to minimise impact on bees. Always follow label and manufacturer's advice.*

For further information:

Visit [www.cottoninfo.com.au](http://www.cottoninfo.com.au)

Or contact Paul Grundy (CottonInfo Tech Lead for IPM) [Paul.Grundy@daf.qld.gov.au](mailto:Paul.Grundy@daf.qld.gov.au)



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