Over the past couple of seasons, silverleaf whitefly (SLW) has become a serious pest problem for many growers in the central and southern production regions. This has most likely occurred as populations of B. tabaci biotype MEAM1 (formerly known as B-biotype) have displaced the native Australian B. tabaci (biotype AUS1). As a result SLW is now well established in these regions.

SLW is a much greater risk to cotton crops than the native species because it is better adapted to using cotton as a host and is much more tolerant of many of the insecticides applied to control other pests. Furthermore, the past few cotton seasons have been characterised by warmer seasonal finishes, providing the heat units necessary for more generations of SLW, leading to higher numbers.

Contributing to outbreaks of SLW is the use of broad-spectrum insecticides to control other pests, such as mirids, as insecticide use reduces beneficial insect numbers. A broad array of generalist beneficial predators, along with parasitoids of SLW nymphs, are very important as they help to slow down the development of SLW populations each season – acting as nature’s braking system.

Reducing the abundance of beneficials diminishes this source of SLW mortality, improving SLW survival and leads to faster population growth. This places additional pressure on the insecticides that we rely on for control, incurring higher management costs, risking the development of resistance and increasing the risk of honeydew contaminated cotton. SLW must be included as part of a well-considered IPM program. There have been many examples of SLW becoming a major pest of cotton when mismanaged.

SLW do not directly reduce crop yield, as most pests do. Instead, the damage caused is the by-product of feeding with excreted honeydew contaminating open bolls. During the spinning process, if ‘sticky’ cotton is encountered it fouls machinery causing mills to shut-down for decontamination, incurring significant productivity losses. These losses are so great that spinners will avoid purchasing cotton from regions with a reputation of sticky cotton, even if bales are dramatically discounted. The aim of SLW management should be to minimise the risk of any honeydew contamination on lint.

A critical factor to take into account when managing SLW is that control decisions need to be made well before contamination occurs. This is particularly relevant for the slow acting insecticides (eg. IGRs) that can take up to 20 days to take full effect.

To manage the risk of honeydew contamination from early boll opening onwards, effective sampling needs to commence well beforehand, through January and February. This sampling should track the development of SLW populations, account for the amount of honeydew being deposited, and consider the potential contribution of beneficial populations on SLW numbers. The existing sampling protocol is based on the 5th node below the plant terminal and is directly linked with the risk of crops incurring honeydew at a level that would create stickiness problems.

While spraying earlier to eliminate SLW from the crop would seem to be a logical approach for managing this pest, it risks applying expensive insecticides to populations that may never reach threshold levels, and also increases resistance selection pressure. The high reproductive rate of this pest could enable numbers to rebuild again before season’s end, requiring repeated insecticide intervention. The recommended approach is to use the SLW sampling protocol and linked Threshold Matrix (found in the Cotton Pest Management Guide) to manage SLW populations to prevent them from contaminating cotton once there are open bolls, while minimising the number of insecticide applications. This ensures that insecticides are only used when required, reducing costs and resistance selection. Poor sampling or ineffective use of the Threshold Matrix can contribute to a failure to prevent population development that could pose a lint contamination threat.

**Resistance update**

In the 2015–16 season, moderate resistance to pyriproxyfen (Admiral) was found in samples from the Gwydir region. While pyriproxyfen resistance has been detected in SLW collected from horticultural areas such as Bowen in North Queensland for several...
THE BALE RUNNER PERFORMS AT REARDON FARMS IN 2016 SEASON REVIEW

With all new equipment, there is a flow of changes required and a settling in period. How difficult was implementing the Bale Runner into your company operations? Very easy. It only required half a day training, similar to any other machine.

How many pickers did the Bale Runner look after during your picking season and did you use any other bale handling equipment? It followed three pickers. We also had one on a tractor with a front and rear attachments. When we caught up we only used the Bale Runner as that was all that was needed.

What was the deciding factors for you to buy the Bale Runner? Carrying more bales per trip meant our tractor only spent half the amount of time travelling and half the time in the cotton stalks. It also was a way to get the bales off the paddock as quick as possible avoiding rain and extra compaction when wet.

How many bales did it carry for you on average per day? Approximately 300.

How many broken bales did you have for the season with the Bale Runner? 0

How efficient was the Bale Runner compared to the traditional tractor mounted bale handling systems and were you able to measure how much more efficient your bale handling was or cost savings achieved? The traditional set up was doing approximately 1/3 fewer bales per day, so as a rough guide if the tractor cost was $100 per hour for a 14 hour day. The cost per bale on a traditional bale handler works out to be $7.00/bale and the Bale Runner cost per bale is $4.66/bale, therefore, saving approximately $2.34/bale.

How safe was it to use? Any difficulty training staff? It was safe and there is no difference in training staff to any other piece of equipment.

How did the Bale Runner go compaction wise, carrying 3 or 4 bales? We had a dry pick, so we only carried 4 bales and had no issues.

Were there any issues created by unloading the bales in wagon wheel style? No.

Is the size of the Bale Runner an issue on the farm when in use? It is bigger, however, it just needs to be treated like any other large piece of machinery. As the axles are close together it turns sharply and I had no issues.

Any other comments or suggestions. This was our first year with the Bale Runner and we are pleased with how well it went and the support we received.

Regards,
Tristram Hertslet
Farm Manager
REARDON FARMS

Inspect the 3 BaleRunner on display at SFM Goondiwindi from Monday 19th December

$5000 PRE SEASON ORDER DISCOUNT UNTIL 31/12/2016

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years, this result is a first for the Australian cotton industry and the centralised location is highly concerning.

For other products such as diafenthion (Pegasus) and newer products such as cyantraniliprole (Exirel), testing indicates that populations remain susceptible. The industry's testing program has shown that SLW have resistance to some of the older neonicotinoids eg. clothianidin. For this reason, mid to late season use of clothianidin should be minimised due to its potential to flare SLW (as a result of SLW's resistance and the disruption caused to beneficials). More recent neonicotinoid products such as dinotefuran are effective on SLW but resistance to the older products serves as a warning against overuse.

The detection of resistance to pyriproxyfen should be interpreted for what it is – a clear warning that SLW is rapidly becoming a major pest management threat for the whole cotton industry and that IPM practices for all pests need renewed focus.

At this stage the detected resistance is rare and therefore is not the cause of control issues reported by some agronomists last season. It is more likely poor field performance has been related to application timing and depleted beneficial insect numbers at the end of the season, as beneficials are critical to maximise the longer term performance of this product. It is also possible that people have unrealistic expectations of the control potential of insecticides like pyriproxyfen that manipulate the dynamics of entrenched insect populations rather than delivering immediate insect mortality.

**Take home messages**

For pyriproxyfen (Admiral) it is critical that usage is restricted to one well timed and targeted spray application per season. The effectiveness and ‘softness’ against natural enemies of this product makes it an important tool in managing SLW. To reduce the risk of overusing pyriproxyfen and other products targeting SLW, a key focus should be to avoid where possible unnecessary sprays early in the season. Rethink adding an insecticide to a glyphosate spray just because the spray rig is making a routine field pass.

Mirids should be only controlled when numbers and crop retention trends really necessitate it. Research has shown that controlling mirids below threshold levels has no effect on yield and may increase the likelihood of needing additional sprays for both mirids and other secondary pests.

Spray oils can be a handy addition for early season mirid management, being both less disruptive to beneficials and antagonistic to other sucking pests such as aphids and SLW. Some spray oils are also compatible with glyphosate and therefore could be a valid option for inclusion with a weed control field operation. Oils typically give 40–70 per cent mirid control and therefore may be a good choice if mirid numbers are getting very close to threshold and a field pass with glyphosate is about to be made.

Other things to consider include exercising good farm hygiene practices and considering the farming operation as a whole from a pest management perspective.

Late in the season as crops mature, SLW will migrate from field to field so be mindful that defoliation decisions have the potential to affect neighbouring blocks. If pyriproxyfen has been used in adjacent fields several weeks apart due to crop maturity differences it’s likely that part of the population will be exposed to the compound twice due to insect movement. This too can greatly exacerbate resistance selection across an area.

Important points to consider when managing SLW:

- **Timing of application is critical:** too early and you may see a resurgence, too late risks contaminated (sticky) cotton;
- **Pyriproxyfen (Admiral) is an IGR that is slow acting, requiring 14–20 days to achieve control and its performance is greatly improved if beneficials are present;**
- **Carefully follow resistance management guidelines when using SLW insecticides; Only a single application of pyriproxyfen should be used per management unit per season; and,**
- **As SLW are highly mobile, consider size of management units when applying insecticides to minimise the risk of repeat exposure on the same population, as this increases resistance selection pressure. Avoid treating adjacent fields more than 14 days apart as this is likely to overlap populations and generations.**

Adopting IPM principles throughout the season helps suppress the development of late season pests such as SLW, aphids and mites.

**Ten IPM practices to adopt**

- **Know your enemies and your friends;**
- **Take a year-round approach;**
- **Think of the farm and surrounding vegetation as a whole system;**
- **Have good on-farm hygiene;**
- **Consider options to escape, avoid or reduce pests;**
- **Sample crops effectively and regularly;**
- **Aim to grow a healthy crop;**
- **Evaluate pest abundance against established thresholds;**
- **Choose insecticides wisely to conserve beneficials; and,**
- **Apply good resistance management principles.**

1Queensland DAF.

2CSIRO.

The CottASSIST SLW threshold tool is available to use at www.cottassist.com.au.

The latest SLW factsheet and the Cotton Pest Management Guide for 2016–17 are available to download at www.cottoninfo.com.au