PestDetect –App to count SLW available for testing in app stores

Following feedback from beta testing last season, the Cotton PestDetect App is now available for pre-launch testing. The Cotton PestDetect App is a digital tool to assist with sampling for silverleaf whitefly nymphs by providing image-derived insect counts using a phone camera. The capacity to assess whether nymphs are viable using a microscope lens attachment to the phone has also been added. The software is based on research and development undertaken with support from CRDC by Dr Derek Long and Dr Alison McCarthy from the University of Southern Queensland (USQ) Centre for Agricultural Engineering in partnership with QLD DAF and CottonInfo IPM Technical Lead Dr Paul Grundy.

PestDetect is used in conjunction with the SLW decision support tool (DST), that was developed by QLD DAF's Dr Richard Sequeira. The app counts SLW nymphs and integrates this information with crop development and pest density thresholds to assist agronomists and growers to make better-informed management decisions. Using geotagged image analysis, the app also allow users to create maps of where pests may be building more rapidly on individual farms or fields. It can also enable timely, impartial measurement of the efficacy of insecticides.

The PestDetect app will be available for testing from Christmas eve from the Android Play store or the Apple store – just search 'PestDetect' .

Please provide any feedback to susan.maas@crdc.com.au

What mobile camera quality do I need?

The app is designed to work with 12 mega-pixel rear cameras that feature on many flagship smartphones released in the last 5 years (e.g. Apple iPhone, Samsung Galaxy, Google Pixel). If your device is older than 5 years or is a lower model, you may experience loss in accuracy.

To use the parasitism functionality, the app requires a microscope lens attachment for the phone – available from APEXEL 200X Microscope Lens Mobile Phone High Magnification For iOS Android | eBay

Can it detect parasitism?

Yes – We received feedback from consultants previously this was critical functionality and there is now a parasitism checking mode for the app. This requires a microscope lens attachment for the phone. (The app is designed to work with **this lens**, using any other lens will not give accurate results). The app will provide a count of parasitised ("para") and viable ("ok"), automatically calculating % viable whitefly. The parasitism checking should be done if SLW numbers start getting a bit higher.

Alternatively you can check for parasitism using your existing workflow and add a % of parasitism into the app. You can then see the full DST with both dots charted from the phone.

How accurate is PestDetect?

The app has been trialled across most cotton growing regions in Australia from Central Queensland to the Lachlan Valley. You can expect the app to calculate the same risk zone for each sample at a management unit as if a trained professional was manually inspecting the photos. It is crucial that users follow the best practice for taking photos to get the best results (see below).

Can it detect other pests?

The app is currently not configured to work for any other pest sampling task. In addition to SLW, the capacity to give an indication of cotton aphids which are found on a similar area of a cotton plant has been explored. The exact counting of aphids and output in relation to recommended thresholds is still a work in progress, and will be displayed as aphid 'V' if detected.

Does it work outside of mobile reception?

You can still process the photos and see the SLW numbers, however you will need to wait until you are back in reception to plot each sample on the DST as the app needs to access weather data.

How do I get the best results?

There are four steps to getting the best results with the app:

1. Keep the leaf out of direct light. A lighting source directly over the leaf will make the whitefly less visible whether you are in the field or at your desk. If out in the field, ensure you take the photo with your body between the sun and the leaf.

2. Hold the phone as close to the leaf whilst being able to focus. Ideally only photograph half of the leaf. Images taken of the whole leaf are unlikely to have the required magnification for the App to be fully effective, and so the app is calibrated for ½ leaf samples. Be sure to not be too close, otherwise the leaf will be out of focus and photo will look blurry. Also choose one half of each image to capture (e.g. left or right) and keep this consistent across all the leaves being sampled.

3. Try to keep the leaf flat to get it all in focus. An uneven surface means that some areas of the leaf may be blurred and not analysed by the app.

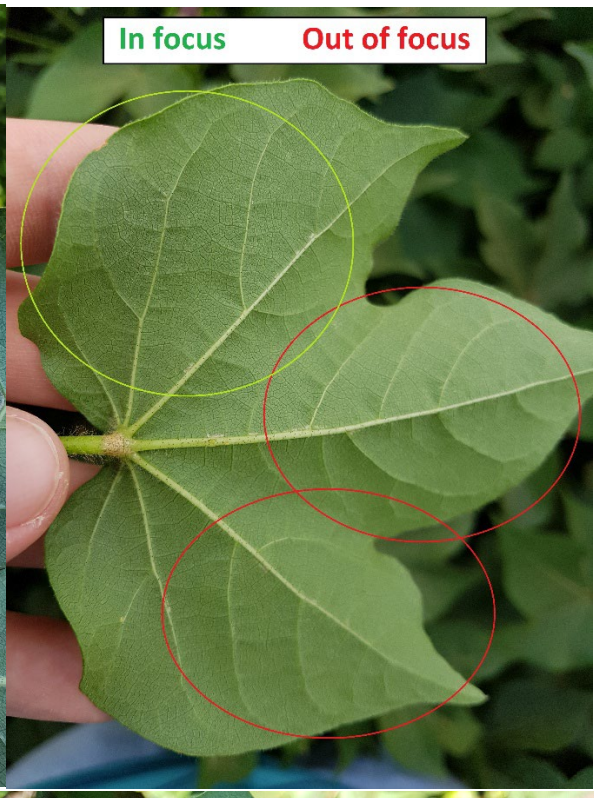
4. Don't have any other green objects in focus at the same time as the leaf. Anything too similar in colour to the leaf may get mistaken for a leaf in the app, so be careful about what background you put the leaf on. This is more of an issue for those that will take the leaves out of the field and lay them on a surface for imaging.

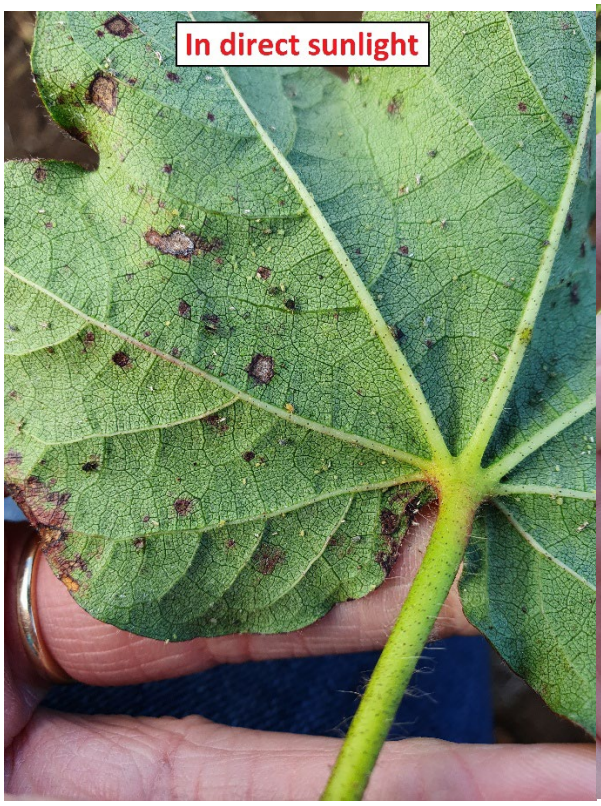
How many ½ leaves do I need to photograph?

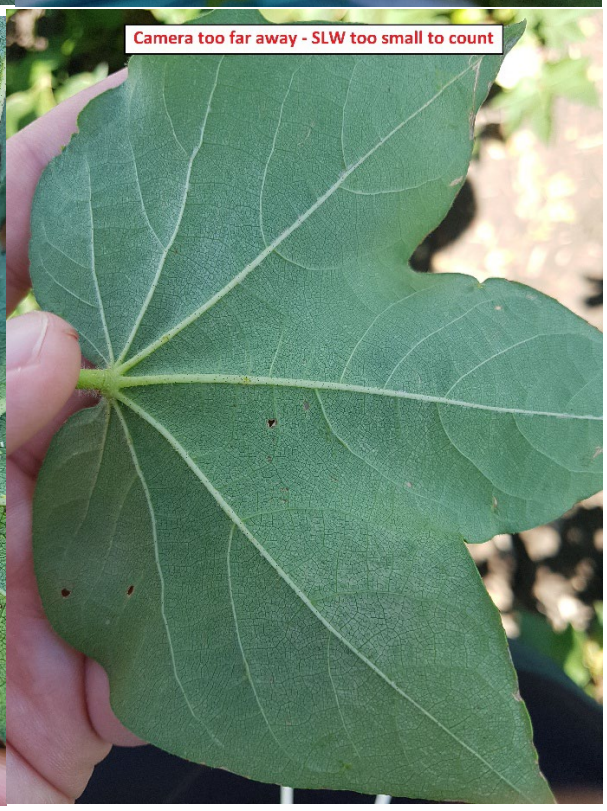
Typically, you should take between 20 and 30 photos per sample. You can get away with closer to 20 photos if you have multiple nymphs on every leaf, but you should take towards 30 if you don't encounter SLW just to make sure that you aren't missing them.

Please provide any feedback or concerns about this test version to susan.maas@crdc.com.au


For good results:
1. Out of direct light
2. Camera held close to leaf
3. In focus
4. No other green objects in focus


In focus
Out of focus


In direct sunlight


Camera too far away - SLW too small to count