

Pale cotton stainers

Dysdercus sidae

Damage symptoms

Pale cotton stainers are occasional pests of cotton in Australia. Economic damage is unusual because of their:

- Susceptibility to insecticides used for other pests;
- Inability to survive high temperatures (> 40°C); and,
- Need for free water to be present.

However in mild seasons Bollgard II crops may be a favourable environment for cotton stainers and they may need to be managed.

Pale cotton stainers are able to feed on both developing and mature cotton seed. Seed weight, oil content and seed viability all decline as a result of cotton stainer feeding. Loss of seed viability should be a consideration in pure seed crops.

Pale cotton stainers are able to damage bolls at any age. They will feed on young bolls, up to two weeks old, leading to boll shedding. Damage to older bolls, 20 days old onwards, usually shows no external symptoms and only small dark marks will be seen on the inside of the boll wall. At this stage most damage is to seeds, reducing their growth and sometimes lint production. Tightlock can result around damaged seeds, preventing the lint from fluffing out as the boll opens, and damaged locks (boll segments) often appear yellow or stained.



Juvenile pale cotton stainers are often found in aggregations low in the canopy. They will feed on developing bolls.

(Lewis Wilson, CSIRO)

Sampling

Sample for adults and nymphal instars of the pest as both stages can cause similar amounts of damage. Where adults and nymphs are observed feeding, monitor percentage damaged bolls.

Frequency

Sample at least weekly once bolls are present.

Usually cotton becomes infested by adults that fly into fields around the time of first open boll, though sometimes, perhaps due to seasonal conditions populations can be found earlier, during boll maturation. Flights of up to 15 km have been recorded. Adults will mate soon after arrival. The expanding population of developing nymphs is likely to cause economic damage.

Methods

Distribution through the field and through the canopy can be quite patchy, as adult females lay eggs in clusters in the soil or sometimes in open bolls. Ensure sampling occurs at multiple sites spread throughout the field. The beat sheet is a suitable sampling method however as some growth stages favour the lower canopy, visual searching is also a good complementary technique.

Bolls of varying ages should be cut open to confirm and monitor for signs of damage. Studies have shown pale cotton stainer bug cause almost no marking to the boll surface. Warty growths may be found on the inside of the boll wall if young bolls are damaged, but older bolls will not have these. To confirm damage bolls need to be opened and seeds cut and examined for browned, dried damage areas. After a week, the lint may begin to have a more yellow appearance and locks will be stuck to the boll wall – a good indication of pale cotton stainer feeding.

The mild, wet conditions that favour the survival of pale cotton stainers in cotton will also favour the occurrence of secondary infections by yeasts, *Alternaria* and bacteria in cracked bolls. These infections can cause tightlock and lint staining. The presence of pale cotton stainers when such damage occurs may be coincidental.

Thresholds

Action threshold during boll development:

When adults and nymphs are observed in the crop and damage to developing bolls is detected, an action threshold of 3 pale cotton stainers/m is recommended. This threshold is based on the relationship between cotton stainer damage and the damage caused by green vegetable bugs. Both nymphs (usually 3rd to 5th stage nymphs) and adults cause similar amounts of damage.

Action threshold after first open boll:

When adults and nymphs are observed feeding in open bolls, the threshold must consider the potential for quality downgrades of the lint as well as the loss of seed weight and seed viability. Where staining is observed a threshold of 30% of bolls affected should be used to prevent a colour downgrade.

Key beneficial insects

A range of natural enemies such as Tachinids (parasitic flies) and predatory reduvid bugs (e.g. assassin bugs) have been recorded in Africa. However, they have mainly exerted pressure when cotton stainers have been feeding on native hosts rather than in-cropping situations. The role of natural enemies in the control of developing populations of pale cotton stainers in Australia has not been studied.



Adult pale cotton stainers are often seen in maturing cotton, often as mating pairs. They can damage maturing bolls. (Lewis Wilson, CSIRO)

Selecting an insecticide

As an occasional pest, there are few products registered for their control. The synthetic pyrethroids lambda-cyhalothrin (Karate Zeon, Matador) and gamma-cyhalothrin (Trojan) are registered; check the labels of these products for more information. However their status as an occasional pest is influenced by their susceptibility to insecticides used for the control of *Helicoverpa* and other pests. Cotton stainers may be incidentally controlled when carbamates such as carbaryl or organophosphates such as dimethoate are used. Any decision to use broad spectrum insecticides such as SPs should take into account their impact on beneficial insects and the subsequent risk of flaring whitefly and other secondary pests should also be considered.

Resistance profile

Worldwide there are few records of resistance to insecticides developing in the field, however cotton stainers will react to selection pressure under laboratory conditions.

Overwintering habit

As there is no resting stage in the cotton stainer's lifecycle, cultural controls between cotton seasons assist greatly in limiting population development (see below).

Alternative hosts

Fuzzy cotton seed used for stockfeed is an important alternative source of food for cotton stainers. Avoid storing fuzzy seed in exposed places where cotton stainers can access this food source over long periods. Controlling ratoon and volunteer cotton is important for limiting cotton stainer's access to alternative food source.

Further Information

Qld DAFF, Toowoomba

Moazzem Khan: (07) 4688 1310 or 0428 600 705

CSIRO Plant Industry, Narrabri

Lewis Wilson: (02) 6799 1550

Solenopsis mealybug

Phenacoccus solenopsis

The solenopsis mealybug (*Phenacoccus solenopsis*) has been found in Burdekin, Central Queensland, Burnett and most recently Darling Downs cotton crops.

Damage symptoms

Nymphs and adults can affect plant growth at all stages of crop development. When infested during early development, plants exhibit distorted terminal growth, crinkled and bunchy leaves, and in severe cases plant death will occur. On older plants, mealybug can cause shedding of leaves, squares and small bolls as well as fewer, smaller and deformed bolls, and premature crop senescence. Heavy infestations (>500 mealybug in top 8 nodes at cut out) has been found to have an 80% reduction in harvestable bolls. Honeydew excreted by the insects onto the leaves and lint can promote the development of black sooty mould.

Sampling

At low densities, mealybugs can be present anywhere on the plant. Trials on mealybug distribution within the plant revealed that they like to aggregate on the underside of leaves and inside bracts of squares or bolls within the top 10 nodes. This suggests assessment of mealybug on these plant parts may give reliable estimations in the field.

Volunteer cotton in a field can be a source of mealybug within the crop. Volunteer cotton grows earlier than cultivated cotton and therefore attracts overwintering mealybug populations in the field (on the root zone of weed hosts or under the soil) and later disperses these to nearby cotton. Checking volunteer and adjacent cotton will help to detect early infestation in the field. Crop stress, such as waterlogging, may make cotton more susceptible to mealybug, so it is important to include stressed areas when checking e.g. tail drains. Investigate patches of stunted or dead plants. As solenopsis mealybug has a very wide host range, also monitor surrounding vegetation including gardens.

If mealybugs are found, contact: Melina Miles (07) 46881369 or Moazzem Khan (07) 4688 1310 to arrange identification and to help track distribution of the species.

Thresholds

Damage thresholds have been assessed, however it is important to note that there are no insecticides registered for the control



Mealy bug predators cryptolaemus lady beetle larva (left) and lacewing larvae (right), can look very similar to mealy bugs. (Zara Hall and Paul Grundy, Qld DAFF)