BUGS FOR BUGS

Berry Bulletin

October 2017

Queensland season wrap-up

The 2017 strawberry season has come to an end, and as always this one has had its distinct personality. It was a season of contrasts defined by high production from early plantings, low production from late plantings, unusual pest incursions, extremely dry weather and prices that were consistently below average.

Influence of weather

An unusually mild and dry winter presented both advantages and challenges for growers. Though there was no significant period of intense winter cold, overnight temperatures consistently remained between 8-15 °C providing ideal conditions for excellent berry quality. Dry conditions ensured low disease pressure for most of the season. However pests such as mites, fruit fly and thrips, were, at times, difficult to manage.

Towards the end of the season extended dry conditions led to a significant depletion of soil moisture reserves. As a result, growers struggled to maintain moisture in the beds despite irrigating regularly. Late in the season fruit size and quality decreased quickly, along with a decline in plant health and vigour.

Use of overhead irrigation proved invaluable in maintaining soil moisture levels. Growers with the infrastructure and water resources to apply overhead irrigation were generally rewarded with better fruit quality.

Varieties

Red rhapsody the winner!

This season Red Rhapsody proved to be the ‘game changer’, offering consistent production, fruit size and quality. We expect there will be significant demand for this variety next season.

Other varieties

The mild, dry winter favoured early planted varieties with Suncoast Delight and Aussie Gem performing well. In contrast, later varieties, particularly Fortuna, performed poorly. Generally, Festival and Camarosa were also mediocre performers.

This year was the first for DAFF developed varieties Parisian Kiss and Sun Drench. Some growers achieved very good results from Parisian Kiss with excellent fruit size and pack-out volumes but challenging in terms of fruit firmness. Sun Drench offered good volumes of large, high-quality fruit early in the season. By mid-season, however it had started to produce excessive numbers of small flowers resulting in a loss of fruit quality and a dip in production.

Problem pests

Two-spotted spider mite

Following a period of low mite pressure early in the season, the dry, warm winter presented considerable challenges for the second half of the season. In blocks that received early introductions of Persimilis with reasonable canopy structure and low levels of pre-existing mite pressure, control was achieved quickly and effectively. However in blocks with significant early mite pressure and with poor chemical control options, it was a struggle. A review of the efficacy of currently available miticides and sprayers should be considered.

Best mite control was achieved by releasing predatory mites into blocks as early as possible. This season there were issues

keeping up with the strong early demand for Persimilis. Releases of the predatory mite Californicus in situations where Persimilis was not immediately available proved to be an effective strategy.

Persimilis did eventually clean up mite affected blocks, again demonstrating their ability to perform, even under the most challenging conditions. Use of overhead irrigation to reduce dust and improve the plant microclimate proved a valuable tool for enhancing beneficial mite populations.

Take home points from this season:

1. Release predatory mites as soon as a good plant canopy has developed;
2. use clean up mite sprays first if pest mite populations are too high;
3. manage the plant microclimate with the use of overhead irrigation to enhance biological control; and
4. reduce dust.

Thrips

Thrips did not became the issue that was expected his season. Unusually high levels of Australian flower thrips (*Pseudanaphothrips achaetus*) appeared but no strong relationship between their presence and fruit or flower damage was found. Agronomists working in other crops also noted this phenomenon.

There was quite a lot of bronzing occurring in the district, particularly early in the season. Many growers were concerned that thrips were causing this damage. However after watching most blocks in the district for the entire season it was difficult to draw any correlation between the bronzing that was being observed and thrips numbers.

Releases of the predatory mite Montdorensis into some blocks that had early populations of Western Flower Thrips and a history of significant thrips issues showed promising results. A good predatory mite population was established and no significant damage to fruit or flowers occurred during the season.

Cyclamen mite

Later in the season cyclamen mites were identified on some farms and this is the pest that may have been responsible for fruit bronzing. These are tiny mites that scrape the surface of fruit and young plant tissue. They are very hard to see and may cause bronzing

Figure 1: Fruit bronzing found in association with the presence of cyclamen mite.

even when in such low numbers that the mites remain undetected.

Plants affected by this mite displayed significant fruit bronzing and seediness. Badly affected plants were stunted, and the stems and young leaves were bronzed. It was not uncommon to find affected plants surrounded by others that showed no signs of infestation.

Control of cyclamen mite in strawberry crops can be difficult. Unfortunately, the most effective chemical available for control of cyclamen mite is abamectin, which is difficult to use during the harvest period because of its long withholding period. This chemical is also harmful to predatory mites so its use is generally not advisable once predators have been released into blocks. Abamectin applications should be considered prior to predatory mite introductions if the presence of cyclamen mite is a concern. The predatory mite Californicus is known to feed on cyclamen mites and this may provide some assistance with control.

Fruit fly

This season has been one of the worst on record for Queensland fruit fly pressure and resulted in the closure of interstate markets to Queensland fruit. The problem of Queensland fruit fly may continue to worsen in the future as traditional insecticides are withdrawn from the market.

It is essential that growers adopt a pro-active approach to fruit fly management that includes

Figure 2: Fruit fly larvae inside a strawberry

the essential elements of protein baiting, male annihilation, monitoring and hygiene. Fruit fly is best managed as part of an area wide approach where all growers in a district work together. Call Sam or Paul if you would like to know more about how you can achieve best-practice fruit fly control on your farm.

Table tops and Queensland fruit fly

Tabletop production is becoming a popular alternative production system.

As expected, Queensland fruit fly hit fruit elevated on tables hard. Queensland fruit fly generally prefers elevated crops as opposed to ground crops, making table tops highly attractive. There may be a good argument for containing tabletop blocks within fruit fly exclusion netting structures to reduce pressure.

Bugs for Bugs may consider hosting a seminar to present on fruit fly control options. Register your interest with Paul or Sam if you would like to attend.

Cotton seed bug – a raspberry nuisance pest in northern NSW and south east QLD

Cotton seed bug became a major problem in raspberry crops both in south east Queensland and the Coffs Harbour area over the past 6 weeks. The bugs have been very difficult to control due to the overwhelming size of the population. The limited number of effective, IPM compatible insecticides permitted for use in raspberry crops also presents a major challenge.

Growers have had to resort to broad spectrum natural and synthetic pyrethrins for chemical control. These insecticides are very hard on beneficial insect populations and repeated use presents a major risk of mite and thrips outbreaks. Unfortunately, because there is such high pressure outside the crop, growers are only achieving very short periods of control before populations build to unmanageable levels again. We believe the raspberry industry should be pushing for the approval of more IPM compatible insecticides that are effective for controlling these, and similar pests such as Rutherglen bug.

Installing insect exclusion screens on tunnel ends and sides may help grows to manage these pests. Insect screens will slow the rate of population development and delay re-infestation after chemical applications, allowing growers to optimise the use of insecticides.

The friendly ‘pirate bug’

Bugs for Bugs crop scouts often find *Oruis* spp., otherwise known as ‘pirate bugs’, naturally inhabiting strawberry crops in south east Queensland, both on coastal farms and in Stanthorpe. *Orius* are recognised as powerful thrips predators which can complement the work done by Montdorensis predatory mites.

They tend to be highly sensitive to insecticides and some fungicides commonly used in strawberry production. This makes it particularly difficult to maintain a good population if growers are forced to use these pesticides.

Keeping ‘pirates’ in the blocks

There has been some good research conducted towards establishing and maintaining populations of Orius in crops using banker/refuge plants. Suitable plant species are established around the perimeter and within crops to provide a habitat and food source for the *Orius* prior to pest numbers building in the strawberry crop. These plantings also provide a refuge for a persistent population if growers are forced to use harmful pesticides. The aim is to have a good population of *Orius* established in the banker/refuge planting before the thrips population has started to build in the strawberry crop. *Orius* will move into the crop as flowering and pest pressure increases.

A wide range of plants have been tested as potential banker plants including apple mint, marigold, castor bean, ornamental pepper,

Figure 3: Naturally occurring *Orius* scouted in south east Queensland strawberry blocks.

gerbera daisy, feverfew, sunflower and flowering alyssum. Of these, **ornamental peppers and flowering alyssum appear** to be particularly suitable. **Sweet basil** is also widely recognised as a suitable banker/refuge plant.

Low rate releases of *Orius* into the banker/refuge planting may be a cost-effective way to enhance establishment of this bio-control agent.

It could be a very useful exercise for growers to trial some plantings with this species next season. We are happy to advise and assist with this process.

Summer strawberry season gets underway

Recent visits to Stanthorpe, Victoria, South Australia, and Tasmania confirm that summer production is now underway.

Stanthorpe has experienced a very warm and dry winter which has extended through September into October. The result has been good plant development but very high early pest pressure. At this stage the main concerns are two-spotted spider mite and thrips. Most growers have had to apply multiple early season clean up sprays for both pests and are now introducing predatory mites into blocks. In Stanthorpe most growers are conducting releases of multiple predatory mite species to optimise thrips and two-spotted spider mite control. The mix of species being used are Californicus, Montdorensis and Persimilis. Bugs for Bugs feel that this is the best combination of organisms when there is likely to be pressure from both two-spotted spider mite and thrips.

In contrast Victoria, South Australia and Tasmania have experienced very wintery conditions through September and into early October. Plant development has been rather slow but plants have now started to move with some intermittent warm conditions over the past couple of weeks. Pest pressure is currently low on most farms, though elevated mite pressure was found in some of the warmer growing areas in Victoria. Growers in these regions are advised not to be complacent. Two-spotted spider mite and thrips activity is likely to increase rapidly with the onset of warmer conditions.

Growers should be planning to introduce predatory mites early to ensure good establishment. Bugs for Bugs advises releasing multiple organisms into farms in the southern regions where both two spot mite and thrips are a major concern. Predatory mites, particularly Californicus and Montdorensis, work more effectively in a preventive pest management strategy.

Both Montdorensis and Californicus are generalist feeders preying on a range of insect pests and surviving on pollen if no insect prey is available. For this reason these species can be established in the crop prior to pressure from the target pests developing. Persimilis should be introduced into the crop at the very first signs of two-spotted spider mite. Bugs for Bugs is more than happy to provide advice to growers in order to optimise their beneficial insect release strategy.

Grower visits

We are currently in the process of visiting farms and wish every grower the best for the coming season. Please do not hesitate to contact the team at Bugs for Bugs, or Mal and Angus from Smartbug.

Wishing you all the best for the remainder of the season,

Paul Jones, Bugs for Bugs Director

Sam Dunlop, Bugs for Bugs IPM Specialist

Bibliography

Bennison J, Pope T, Maulden K (2011). The potential use of flowering alyssum as a ‘banker’ plant to support the establishment of Orius laevigatus in everbearer strawberry for improved biological control of western flower thrips. IOBC/WPRS Bull 68:15–18.

Cano M, Vila E, Janssen D, Bretones D, Salvador E, Lara L, Tellez MM (2009). Selection of refuges for Nesidiocoris tenuis (Het.:Miridae) and Orius laevigatus (Het.:Anthocoridae): Virus reservoir risk assessment. IOBC/WPRS Bull 49:281–286.

Pumarin˜o L, Alomar O (2012). The role of omnivory in the conservation of predators: Orius majusculus (Heteroptera: Anthocoridae) on sweet alyssum. Biol Control 62:24–28.

Waite MO, Scott-Dupree CD, Brownbridge M, Buitenhuis R, Murphy G (2014). Evaluation of seven plant species/cultivars for their suitability as banker plants for Orius insidiosus (Say). BioControl 59:79–87.