BIOLOGICAL SERVICES

Newsletter

August 2013

Welcome to the Biological Services newsletter. Sorry it has been a little while since we last sent one. A lot of exciting things have been happening since our last one - new products, new rearing methods, some new staff and lots of new success stories.

Inside this issue:

Neoseiulus californicus off plant

After a number of years, several false starts, crashes and extra grey hairs, James Altmann has managed to develop a successful off plant rearing system for the predatory mite *Neoseiulus californicus*.

In the past, *N. californicus* was only able to be reared on plants using spider mites as prey, which meant high labour costs, and large areas were required to produce them. Not any more! No greenhouse and no plants are needed now. It's still tricky to get the balance right, but it is a system which can produce high numbers of predators quickly and efficiently. Great news for growers! *N. Californicus* produced in this way are sent to growers in a bran/vermiculite mix, which also makes it very easy for growers to sprinkle out evenly over the plants they want to treat. Most growers with some experience in bio controls will be familiar with the red predatory mite, *Phytoseiulus persimilis*. It's a very effective predator of two-spotted mite but sometimes struggles in field crops under the hot, dry extremes of the Australian climate. It is also very much a specialist, feeding only on spider mites. *N. californicus* on the other hand, is more of a generalist. In the absence of two spotted mites, which are still its preferred prey, it will feed on thrips larvae, broad-mites, cyclamen mites and pollen. It also helps control bean red spider mite, european red mite and false spider mites (*Brevipalpus spp*). Californicus is also quite hardy to a range of pesticides. It will generally reestablish a lot quicker than Persimilis in crops where residually toxic chemicals have recently been used.

Californicus can be used in outdoor tree crops, vegetable crops and melons. Overseas they are also used on crops such as capsicums, eggplants, gerbera, roses and strawberries.

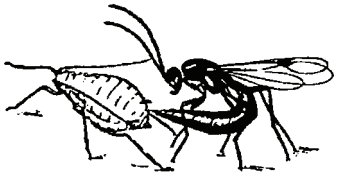
We are currently undertaking a number of greenhouse trials to see how it performs under local conditions.

Neoseiulus californicus feeding on two spotted mite

Benefits of rearing Californicus off plant:

- Easier distribution of Californicus
- Easier to transport
- Reduced courier fees due to more mites in less volume
- More cost effective for growers—higher numbers at lower cost
- Tolerates many pesticide residues
- Tolerates hot/dry conditions
- Feeds on a range of pest mites

New aphid parasite available now -Aphidius ervi



One of the biggest problems with aphid control is the selective preferences of some parasites. Green peach aphid can be easily controlled by *Aphidius colemani* in crops such as capsicums, eggplants and herbs. Unfortunately, there are a range of other aphids that can infest these crops that cannot be controlled with *A. colemani*. For this reason, we are now also producing *Aphidius ervi*. This wasp is able to parasitise larger aphid species such as *Aulacorthum solani* (foxglove or glasshouse potato aphid), *Macrosiphum euphorbiae* (potato aphid) and *Acrythosiphum spp*. A. *ervi* may be sent mixed with *Aphelinus abdominalis* and *A. colemani* to ensure as many aphid species are covered as possible. Where several crops are growing in the same greenhouse space (such as nurseries) this parasite mixture will be very useful as it is often difficult to identify aphids to species.

Scouting in a strawberry crop, A.F. Parker & Sons, Uraidla (Adelaide Hills)

IPM success story in SA strawberries

Six years ago we were approached by a leading South Australian strawberry grower to try to help them develop a biologically based program to aid in the control of western flower thrips (WFT). We declined, as the damage sounded severe and we knew how difficult WFT were to control. The following year we were contacted again. This time with a plea, that we must help or they may need to grow a different crop.

With the help of Lachlan Chilman (Manchil IPM), who was already proficient in monitoring strawberry crops (and rearing Persimilis for two spotted mite (TSM) control), we put together some suggestions for a trial. We were given a direction from the grower - "NO TRIAL, we are doing the whole property". We suggested high release rates of available predators : Hypoaspis predatory mites for the soil (for thrips pupae), as soils are fumigated prior to planting which kills all living organisms, good and bad. Cucumeris predatory mites to the foliage (for thrips larvae) and Persimilis predatory mites for TSM control. After a lot of nail biting, careful monitoring and encouragement from the grower, it worked. At the same time, Paul Horne (IPM Technologies) was developing the same program for Victorian strawberry growers. Again, there were some teething issues, but it worked there also.

Five years later we estimate that 90% of the strawberry production in SA, WA and Victoria is using an IPM program heavily based on releases of predatory mites for WFT and TSM control. The Parker family from the Adelaide Hills is very happy— good control and less pesticides. They and most of the other growers have reduced their insecticide and miticide applications by at least 85% each season. Paul Horne and the Victorian Strawberry Association measured IPM adoption in Victoria and believe it is one of the fastest and most widespread adoptions of an IPM program known anywhere in the world.

In conjunction with Manchil IPM we are now using Orius in covered strawberry crops where WFT can escalate to high levels. Orius can feed on adult thrips in the flower, giving increased control in these areas. If successful, Orius may well become part of the overall strawberry program in the future.

"It is one of the fastest and most widespread adoptions of an IPM program known anywhere in the world"

Adult Orius

New Crop Hygiene

With spring just around the corner, many vegetable growers will be planting new crops. Whether growing indoors or outdoors, crop hygiene begins in the old crop. Weeds both around the crop, or in the crop can act as pest reservoirs. By eliminating all hosts weeds for key pests in and around the crop you are not only reducing possible pest breeding areas, but also places for pests to alight and rest. Weeds can attract pests into a crop, where they would otherwise not be a problem.

Broadleaf weeds such as nightshade can host pests as well as virus. Grasses are generally less of a problem.

If you have had a major buildup or problem with insect or mite pests in an old crop, it may be a good idea to spray the old crop to reduce pest numbers as you pull the old crop out. Be careful not to use residually toxic sprays that may hinder establishment of beneficials in your next crop.

It is best to remove old soil grown crops from greenhouses as soon as possible and ideally remove the old plant material off the property altogether. This prevents the migrations of pests from rotting plant material, and possible virus/disease transmission to new crops.

Biocontrol trials on the Adelaide Plains

Insecticide resistance to western flower thrips, aphids, two spotted mite and greenhouse whitefly is causing greenhouse growers on the Adelaide Plains significant stress. This combined with high levels of virus transmission from thrips is in some cases wiping out capsicum crops with 2-6 months. Capsicum IPM programs in other states (WA, Vic, Tasmania) have been working well for several years, but the pest pressure in most instances is lower than here. A breakthrough in controlling thrips occurred when Manchil IPM developed a successful rearing program for the flower dwelling predator Orius. It is a voracious thrips predator. Biological Services and Manchil IPM jointly developed programs to combat all of the main pest species in conjunction with some soft chemical applications.

In 2010 we commenced trials in Virginia collaborating with Tony Burfield (SARDI) and Bill and Emmanuel Cafcakis, two brothers keen to reduce their reliance on pesticides.

The trials were promising and progressed further through 2011 with very encouraging results. It was time to broaden the program to commercialization.

Last year we monitored and released beneficials into capsicum and cucumber crops for 15 growers in the Virginia/ Two Wells district. Nearly all of these crops were a great success; however, as their crops are grown in the soil, there have been some issues with carry-over pesticide residues causing a few establishment problems for the beneficial organisms. An increased number of growers have committed to IPM programs in 2013. Good results this year could lead to area wide option in 2-3 years, drastically reducing pesticide use on the Adelaide Plains. Programs for cucumber, tomato and eggplant are also available

A healthy crop of yellow capsicums in Virginia

What happened to Aphytis?

Last season, for the first time since 1972, Biological Services failed to produce adequate numbers of *Aphytis melinus* for the southern citrus growing districts. Production always varies from year to year, but never have we had a complete failure.

What happened? We went into winter with a good colony. Around late June we started getting significant fungal breakdowns in our pumpkins that are used to grow the scale. By July, we had started buying in fresh supplies of pumpkins from Northern Queensland, as our home grown fruit was completely ruined. Not only was this very expensive, but the fruit quality received was poor and contaminated with pesticide residues.

The result—disaster. We sincerely apologize to all growers and consultants for the lack of supply. At various stages through the year, it looked like we may get back on track, but it wasn't to be.

The culture is strong again and releases will recommence in September 2013. Unfortunately last year also appears to have been favorable for red scale development in many orchards; therefore releases of parasites this season will be very beneficial. Contact the office for contract releases details and to let us know when you want them.

Aphytis female parasitizing a red scale

Pheromone orders

Pheromone lure and codling moths on a sticky base

It is hard to believe that it is August already. Spring flowers are starting to appear, which means summer is not far away. It is time for growers to be putting pheromone traps out in the orchard.

Please contact Sue in the office for light brown apple moth, codling moth and oriental fruit moth pheromones and traps.

Delta trap hanging in a crop