



# BIOLOGICAL SERVICES

Newsletter

December 2015

## Welcome to our 2015-2016 Spring/Summer newsletter

Our newsletters will help you keep up-to-date with any new developments and interesting relevant scientific IPM research in the field. This newsletter contains contributions from our in house consultants across the country, and helpful information on how to maximise your IPM successes in the field.

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## Issues inhibiting the use of Integrated Pest Management (IPM) for greenhouse vegetable crops

Over the past few years more growers have introduced the predatory bugs **Orius** and **Nesidiocoris** into their crop protection programs. During this time we have come across important issues that in many cases are hindering the successful establishment of these predators. Most of this relates to chemical residues, and on farm hygiene.



Neonicotinoid chemicals such as Imidacloprid (Confidor®) used in previous crops can last in the soil for several years. When new seedlings are planted into this previously treated ground, pesticide residues can be found in the plant tissues. Even low levels of these pesticides inhibit the establishment of the predators **Orius** and **Nesidiocoris**. Growers wishing to start an IPM program need to restrict the use of soil applied neonicotinoids in their crops for at least 12 months, (and preferably longer) before any IPM programs that utilise predatory bugs such as **Orius** and **Nesidiocoris** are considered.

Imidacloprid is very stable in soil when not exposed to sunlight, although slow microbial breakdown activity will occur. Imidacloprid is also immobile in soil, so will stay pretty much where it is put. This indicates that there is no quick way to break down the product in the soil – but the following may be possible ways of addressing the issue:

We refer growers who have contaminated soil to Bayer's recommendations for breaking down Imidacloprid residues in the soil:

Dilution – presumably the product has been applied in defined furrows, and concentrated spots may exist. Plants may have less opportunity to pick up soil residues, and residues may break down faster if more widely distributed by cultivation (mixing soil both deeper and laterally across the previous row direction).

Increasing biological activity of the soil – increasing humus and keeping the areas moist during the warmer months to maximise soil bacteria activity.

However the most common chemical to inhibit the success of IPM programs are Pyrethroids such as Bifenthrin (Talstar®, Bouncer®, Procide®, and a range of generic brands). These chemicals are extremely toxic to all beneficial organisms but especially **Orius** and **Nesidiocoris**. It can take 6 months or longer for this compound to break down to levels that are no longer

toxic to beneficials. We would recommend that growers wishing to start an IPM program do not use these products in their greenhouses for at least 6 months before an IPM program is commenced. Residues on walls, posts, gutters and floors can still be detrimental after the previous crop is removed and the greenhouse has been washed and sterilised. It is also important that no pyrethroid chemicals are used in the nursery prior to receiving your new plants.

Greenhouse growers who are growing crops in the soil and have previously had high levels of pest infestation should look to fumigate their soil before planting new crops. This will not only control most insect pests in the greenhouse, but it will also help in controlling nematodes and root diseases. Too often in the first few weeks after planting seedlings we discover a high presence of thrip activity, and virus infection due to pests emerging from pupae in the soil. If you start your new crop as clean as possible it will give you the best chance of commercial success.

To keep crops clean from all pests it is strongly recommended to use insect screening of walls and vents, and to install double doorways to exclude the entry of pests from outside. This is extremely important in the early stages of crop establishment. Pests such as thrips, whiteflies, aphids, moths, mirids and bugs are highly mobile and attracted to soft foliage of new plantings. Lifting the sides of greenhouse walls for ventilation or harvesting is an extremely dangerous practice for the lifetime productivity of your crop if suitable screening is not present.



Screened double door entry to reduce pest migration

Growers must also keep their properties clean of weeds that host pests and disease both inside and outside of the greenhouse at all times.

## Improving establishment of *Nesidiocoris* in tomatoes/eggplant seedlings

**Nesidiocoris** is recommended for use on tomato and eggplant (aubergine) crops mainly for controlling greenhouse whitefly (*Trialeurodes vaporariorum*) and silver leaf whitefly (*Bemisia tabaci*). These predators will also feed on moth eggs, young caterpillars, thrips and mites.



*Nesidiocoris* adult feeding on white fly nymphs

Releases of **Nesidiocoris** in the greenhouse have given some uneven establishment results. Release points can be overdosed resulting in some plants becoming over inoculated. This can lead to some early plant damage, and conversely many plants between release points are not inoculated at all. It may not be until the second generation that all plants have a presence of predators. This can give whitefly and other pests an advantage, and especially where pest levels are high, or where winter temperatures are cold the pest population can increase faster than the predators. Early sprays are then required to lower pests, which also impacts on the predators and the cycle is continually impeded.

**Nesidiocoris** released in the nursery prior to planting out in greenhouses provides improved and more even establishment. When plants are close together it is much easier to apply **Nesidiocoris** lightly across the whole crop. This method allows more plants to be inoculated with low levels of **Nesidiocoris** eggs giving very even distribution of the predators after planting out. This release method is also very quick and saves the grower a lot of time rather than walking every row in the greenhouse after planting. A single release is generally all that is required for the life of the crop.



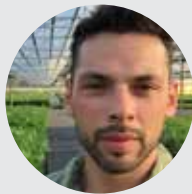
Seedling trays labelled at Nurseries for *Nesidiocoris* inoculation

We recommend nursery release of predators 4-7 days prior to shipment of seedlings. Within the first week of planting transplants you should see juvenile ***Nesidiocoris*** hatching out. Working with the nurseries also reduces the risk of cross contamination of residual pesticides onto the seedlings.

Over the last few years Biological Services has worked closely with Trandos Seedlings in WA to implement the releasing of *Nesidiocoris* on grower seedlings in the nursery before they are dispatched to growers around Australia. We have also started working with Virginia Nursery in South Australia to service growers on the Adelaide Plains. Growers ordering plants from these sources and considering nursery releases should contact us, or notify the nursery at the time of ordering. Over time we hope to make arrangements with other nurseries to implement similar services for more growers. At least four weeks lead time is required to prepare for the releases of ***Nesidiocoris***.

## Strawberry Season 2015: WA

Cezar Moraes  
IPM Consultant, WA



### Control of Two Spotted Mites (TSM)

For many years strawberry growers in Australia have been using the predatory mite ***Phytoseiulus persimilis*** to successfully control two spotted mites in their crops, however some growers still persist with spraying of miticides and insecticides. These growers are finding it harder to control TSM due to the ever increasing resistance to miticide chemicals. This problem is exacerbated by the same

chemicals being used in the strawberry plant propagation by registered runner growers. In an attempt to keep plants as clean as possible for growers miticides are regularly applied to plants during propagation. As it is impossible to get complete control plants often arrive on growers farms infested with mites. These mites are now arriving to grower's farms with high levels of miticide resistance. This year WA growers started their crops with 5-15% of plants infected with mites on the strawberry runners. To combat this we needed to release ***Persimilis*** at the very beginning of the season. We have been able to achieve good results avoiding plant damage. Most mites were controlled by early August and, there has been a reduced need for miticide sprays with many growers not using any mite sprays at all.

This season one of our growers accidentally sprayed the miticide Paramite® early in the crop. This chemical is very toxic to predators and is residual for many weeks/months. This farm took 8 weeks longer to achieve mite control with ***Persimilis*** than other properties, and 3 extra releases of ***Orius*** were required to obtain proper establishment for thrip control.

### Control of Western Flower Thrips (WFT)

WA strawberry growers were pioneers to work with *Orius* in strawberries in Australia due to severe WFT populations and damage. *Orius* is a thrip predator that establishes in the strawberry flowers, and controls all stages of WFT and plague thrips. Over the last 3 seasons, growers that have introduced *Orius* on their strawberry farms have not needed to apply pesticide sprays for WFT. Conversely growers that are only relying on pesticides had already sprayed 7-10 times prior to the end of September, with pest pressure remaining high resulting in deformed flowers, and bronzing of fruit.



*Orius* adults in a strawberry flower



We welcomed our new crop consultant Bhavesh Kunadiya in mid-May. Bhavesh has filled the role of Parag who now looks after our growers in Victoria and Tasmania.

## Adelaide Plains

Jake Bryne  
IPM Consultant SA



Things really started to kick off in September/October with most capsicum growers beginning to release beneficials into their crops.

Thrips levels had been very low through winter and for the first half of September, but a few warm/hot days saw levels increase drastically. Currently thrips are very high and we expect that this will continue into December. Prior to commencing the IPM program we suggest spraying every 3-4 days with the products advised until beneficials are released. Growers with thrip screening installed have a major advantage and spraying can be reduced substantially.

Most capsicum growers suffered from aphid outbreaks within a few weeks of planting this season. Aphid parasites should be released as soon as the early spray schedule has ceased. It is important to try and get parasites established prior to any whole crop sprays for aphids are applied. These sprays may also hinder **Orius** establishment. Keep a close eye on your young crops for signs of Aphids, including fine white speckling on the heads (the moulted exoskeleton of the aphids). Spot spraying may be an option if outbreaks are isolated once parasites have been released. Now **Aphidius** is well established and Aphids well controlled.



*Aphidius colemani*  
laying an egg into an aphid



100% Parasitised  
aphid mummies on capsicums

One of the biggest problems we have in the Adelaide Plains is contamination from chemical residues. This contamination can occur when spray equipment is not properly cleaned, or drift from neighbouring houses gets into IPM crops. There have also been many new growers struggling with the amount of Confidor® or

Talstar® in their ground. We have some information on cleaning of spray equipment if growers require it. Anyone wishing to do IPM in the future, must not apply Confidor® to the soil for at least 12 months prior to implementing IPM programs, or Talstar® (or any other pyrethroids) foliar sprays for 6 months prior.

We are expecting a long, hot season and will be working especially hard to ensure we keep on top of pest outbreaks at all farms. Early detection is the key, so we are also counting on cooperation and communication with growers, in conjunction with our monitoring. Working together I am sure we can have a successful season.

We are happy to welcome two new employees to the Adelaide Plains this season: Ryan O'Flaherty who has been with us for 5 months already, and was previously working in canola seed production for Bayer in the Mount Gambier area; and Stephanus Malherbe who started in September. Stephanus comes to us from South Africa where he was working for the largest tomato grower in the country. Stephanus also has a PhD in Plant Pathology.

## IPM in Victoria/Tasmania Spring 2015

Parag Borse  
IPM Consultant, Vic/Tas



### Strawberries

Warm weather started earlier this season (October) for strawberry growers in Victoria/Tasmania. Two spotted mites (TSM) were high on runners, and have built up quickly at early stages of crop development from the warm spring weather. **Persimilis** have already been released in all the farms and are building up nicely. This warm weather also bought high levels of plague thrips into the crops earlier than the previous year. **Cucumeris** has been released into all plantings once good flowers were present and has also established well. WFT is generally low at the moment. The aim of IPM for this season is to clean up TSM quickly with predators by early December, and then concentrate on managing WFT in the crop once summer commences properly from December onwards.

### Greenhouses

Establishment of **Nesidiocoris** on greenhouse tomatoes was slower due to cool conditions and many growers not inoculating at the nursery stage. This has affected the uniform establishment of

**Nesidiocoris.** The regular use of Sulphur pots has also interfered with the establishment of **Nesidiocoris** in some cases. Burning Sulphur is toxic to **Nesidiocoris** in establishment phases. In some instances application of Talstar® in the previous crop has not allowed **Nesidiocoris** to establish at all. In most cases predators have now established well and will require close monitoring to achieve the right balance between pest and predator.

Capsicum and eggplant crops are proceeding nicely but early aphid pressure was a concern. Parasites have generally given good aphid control once well established.

## Improved quality and delivery of predatory mites

**Cucumeris** (for Thrips control) and **Californicus** (for Two Spotted Mite Control) are now being supplied to growers in a more concentrated form, and in a new improved packaging unit.



Packaging and Filling Machine

Previously these predatory mites were shipped at 40-50,000 predators per litre. To reduce freight costs to growers they will now be supplied at 100,000+ predators per litre. To allow predators to breathe and arrive in peak condition they are now delivered in rigid cardboard tubes which will reduce the potential for damage or spoilage in transit.

The rates of predators per hectare and the cost per hectare will stay the same. The amount of substrate released per hectare however will be halved. It is still recommended to have 2-2500 release points per hectare. Therefore instead of 10 mL of substrate (dessert spoon) at each release point, growers should use 5 mL (teaspoon) at each release point. Where high release rates are utilised predators can be evenly sprinkled out over the crop foliage directly from the tube. Before releasing each tube should be gently rotated from top to

bottom several times to evenly mix the contents prior to opening. Where large areas are being treated several tubes should be emptied into a bucket at a time. Only open and use enough material that can be released in 10-15 minutes at a time. The remainder should be kept cool and in the shade until they are needed.



Cannisters ready for dispatch

The more concentrated predator substrate and the new packaging will give better results to growers, and reduce freight costs which have increased significantly in the last year.

Canister tubes come in two sizes. One litre tubes are used for small orders and to round up exact literage of larger orders. Larger tubes have been designed to maximise the internal space of standard freighting boxes. The larger tubes hold 1.5 litres of predator substrate.



## Merry Christmas

The staff at Biological Services wish you all a happy and safe Christmas and New Year. Please contact the office if you are going to be away over this period and you need to change your order.