

Digester improves nutrient recycling

If managed properly crop residues can return valuable nutrients back into the soil for the following crop.

A block of broccoli post-harvest was cultivated then divided in two, with half of it being treated with Digester at 4lt/ha, and the other half left untreated. Microbial tests were carried out on both halves of the block to give an indication of the rate of decomposition. The test showed the untreated block had higher anaerobic and yeast levels, indicating a slower rate of decomposition. The treated area had a lower total microbial count, indicating that decomposition had been completed. The treated block also had a fungal-to-bacteria ratio in the desired range.

When a standard soil test was carried out, the application of Digester had increased soil mineral levels of calcium, phosphate, potassium and magnesium. The application had also increased the

cation exchange capacity. However, the increase hadn't diluted the nutrient levels in terms of base saturation, or altered the soil pH. In other words, hydrogen hadn't rushed in to occupy the vacant sites on the soil colloid to cause a drop in pH.

The combination of quicker decomposition and higher nutrient levels meant the half of the block treated with Digester was ready to plant at least two weeks earlier than the untreated half.

Digester Nutrient Recycling

	Untreated	Treated	% Increase
Cation Exchange Capacity	19.75	24.10	+22%
Total Base Saturation	66.92%	72.90%	+9%
Mehlic Phosphate	143kg/ha	157kg/ha	+10%
Calcium	5,012kg/ha	6,625kg/ha	+32%
Magnesium	381kg/ha	537kg/ha	+41%
Potassium	377kg/ha	509kg/ha	+35%

For a full trial write up, contact Ross MacDiarmid 021 354 880

New Silage King car hits the road

Grant's new Silage King car is turning heads Silage King is New Zealand's fastest growing brand of silage inoculant and hay preservatives so it was only fitting that Grant's car should look at home on the race track. The new car graphics are part of a revamp of BioStart's popular silage inoculant and hay preservative range.

"I've only had the car for a couple of weeks and it's already caused quite a stir, says Grant.

Apart from the car BioStart has also been working with the suppliers of its range of applicators to make some improvements. The dose pump now comes with a flush kit and granule applicator has a new diffuser for the blower. **For more details and new season pricing call Grant Kay 021 764 247**



Contacts: Horticulture Territory Managers
 Ross MacDiarmid 021 354 880
 Simon Budd 021 733 110
 Geoff Warmouth 021 794 276

Silage and Arable
 Grant Kay 021 764 247

BioStart Limited
 216 Lake Road
 Takapuna, Auckland
 New Zealand

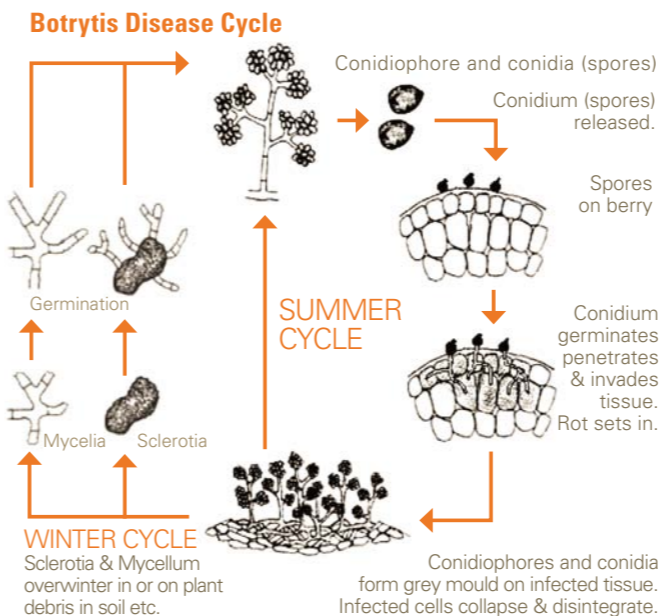
Australia
 Ray Hambrook
 0428 66770



Reduce disease overwintering

The first step in reducing disease inoculum levels for next season is the complete decomposition of leaf litter and prunings over winter.

Many diseases including botrytis, sclerotinia, downy mildew and powdery mildew have the ability to overwinter on un-decomposed leaf litter and prunings. A simple way of reducing spring inoculum levels is to ensure the full decomposition of all leaf litter and prunings over the winter months.



Digester uses a combination of enzymes, signal molecules and bacteriocins from the fermentation of *Pseudomonas putida* to activate the soil microbes responsible for decomposition. These saprophytic fungi produce the enzymes and organic acids that break down the cellulose and lignin in the litter and prunings.

Trials carried out by Fruited Supplies to assess Digester's ability to speed up decomposition confirmed the findings of an earlier trial at the Gorse research centre in Belgium. The trials compared Digester against an application of nitrogen. In both trials Digester was found to speed up decomposition.

Local trials carried out by Karin Watson of BioCult in Cambridge have shown that Digester inhibited *Venturi inaequilis* (Apple Black Spot) spore germination, prevented spore establishment and had a curative capability when the disease was established. It must be stressed that these results were under laboratory conditions, further field work will be carried out this year.

Digester *Venturi inaequilis* (Apple Blackspot) spore germination inhibition laboratory test

	% Spore Germination Mean	% Germination Inhibition
Untreated	83.0%	0.0%
Digester	6.3%	92.4%

For a full write up of the trials contact Stephen Wrigley 021 848342

Tech tips

Mix Digester with defoliating sprays

An easy way of applying Digester is to apply it with defoliating sprays. Digester is compatible with both urea and copper-based sprays. A percentage of the spray will drip down onto the orchard floor, priming the decomposing microbes prior to leaf fall.

Mulch after pruning

Mulching increases the surface area that the soil microbes have to work on, speeding up decomposition.

Splitting your Digester application for high Disease pressure

To prevent disease overwintering in orchards with a high disease pressure, it's recommended to split the application of Digester. Apply the first application of 3lt/ha at leaf fall and another 3lt/ha after mulching the prunings.



TripleX nails botrytis in hothouse

Kevin Petrie of North Canterbury Tomatoes aim is to reduce the number of chemical sprays he uses in his growing operation. So when an outbreak of botrytis took hold prior to December in one of his 3 houses he tried TripleX.

"Between the weather and earthquakes, it's been a challenging season for us," says Kevin. "The combination of lower than usual sunshine hours and humidity getting to over 90% has put the crop under some additional stress this season.

"Despite the season, the crop was looking good until early December, with good sizing and colour. As the crop load came on pre-Christmas, we started to see the first signs of botrytis. It seemed to start with the leaf wound and just got worse. I knew we had to act fast to minimise crop losses. I needed something that would stop the botrytis in its tracks. I'm trying to limit the number of chemical sprays we use, so it made sense to look for a biological. That's when Brett from Fruitfed suggested we use TripleX."

For a full hothouse programme call Geoff Warmouth 021 794 276

"I'd had some very good feedback from several of my grape and capsicum customers using TripleX," explains Brett. "They had seen it dry up the botrytis in their crops, so I was confident it would work for Kevin."

TripleX works differently from most biological fungicides because it has a unique, dual mode of action. It contains bacteriocins, enzymes and secondary metabolites from a base fermentation, which clears a pathway for the establishment of the product's active, *Bacillus amyloliquefaciens*.

Kevin applied TripleX in his infected houses at 1.5lts/ha, concentrating the application on the de-leafed stems.

"Within two days the botrytis was drying up, and by the end of the week we had it under control. Based on what we saw here, we'll be incorporating the product right from the start of the season rather than waiting for the problem to emerge."

I'll start a programme four weeks after planting this year, and increase the targeted area from just the de-leafed stems to the whole canopy. The idea is that this sort of preventative programme should build up good populations of beneficial microbes on the leaves and fruit, and prevent another botrytis outbreak. I believe coverage is important. I've got a purpose built sprayer with ten aside adjustable nozzles, so we can get good coverage even on the back sides of the leaves.

Joint venture project tackles nitrogen-fixing bacteria

BioStart has formed a joint venture company with Dr Von Johnson of Enformtech.

The new company Biolnoculants is currently in the final stages of its first project, to develop a bio-fertiliser based on a strain of *Azotobacter*. The \$200,000 project, half funded with a TechNZ grant, has focused on how the nitrogen-fixing bacteria can be mass produced.

"It's relatively easy to get the fermentation to work on a small scale in the lab," explains Dr Johnson who specialises in fermentation and the formulation of microbial products. "It's a different story when you start to scale up the production to commercial quantities. There have been a number of technical challenges we've had to overcome."

Initial glasshouse trials involving wheat, barley, canola and maize have shown the benefit of inoculating the soil with *Azotobacter*. The next round of trials will look specifically at how much traditional nitrogen inputs can be reduced by supplementing with *Azotobacter*.



Suspension fertiliser

"I've got a simple philosophy to growing' says Simon Budd, BioStart's Horticultural Territory Manager based in Tauranga. 'In order to get the best out of your orchard you need to address the nutritional needs of both the crop and that of the soil microbes."

In order to get the soil biology cranking I've been using a combination of suspension fertiliser and Mycorrhizae and Digester with a number of customers. We've seen quite a turn a round in soil health. Says Simon. 'You only have to dig a few holes to see the improvement in worm numbers and root health.

'The problem with conventional fertiliser is the size of the granules. If you look at it from a microbes perspective it's too big', explains Simon. 'By grinding the fert to less than 100 micron we've got around this problem. The fine powder is then mixed with water and applied as a slurry through specialised spreaders. The even distribution from the applicators makes it ideal for applying trace elements such as zinc and iron', adds Simon.

'We're seeing as soil microbial populations increase, the grass sward becomes more clover dominant. I've been keeping a close eye on leaf and soil tests and I've been able to slowly reduce the amount of nitrogen going into the mixes. I'm now in a position where I can look to reduce some of that summer vigour through our fertiliser program.'

Suspension fertiliser is ideal for winter base applications of NPK and summer applications of potassium.

For more information contact Simon Budd 021 733 110

