Ozone, nature's disinfectant

Tessa Nicholson

A Hasting's based company is celebrating three innovation awards, for a product that could have a major impact on the world of viticulture.

Hydratorq Ltd, distributor for BioFume Ozone, picked up the Locus Research Innovation Award and Fieldays Innovation Launch Award at Mystery Creek this year, and a few weeks later won the innovation award at the National Horticulture Fieldays in Hawke's Bay. The awards were for their ground-breaking development of a product that could deliver ozone directly onto plants, disinfecting them.

There is nothing new about the sterilising abilities of ozone. When mixed with water it is 3000 times faster acting at killing bacteria, fungus and mold than chlorine. The biggest problem is, it is so unstable. Ozone has a half-life in water of approximately 20 minutes after being formed, meaning its use in the past has been confined to buildings, and not in the field.

Ozone or O3 is a naturally occurring gas, created via an electrical shock. The shock separates oxygen's two molecules, leaving singles to join up with other oxygen molecules, creating ozone. Within a short time frame, the third molecule breaks off, leaving just oxygen or O2.

Greig Denham from Hydratorq Ltd says there is no residual effect after 20 minutes.

As for the sterilizing capabilities, trials in the US have shown

The award winning innovation, that can deliver ozone directly onto plants, disinfecting them.

ozone is effective on mites, fungus, powdery mildew and botrytis. After this year's autumn weather, anything that deals with botrytis in such an organic way, could be a godsend for the wine industry.

BioFume Ozone has developed a system where the unstable gas can be mixed on the spot with water, within a spray unit.

"It is a relatively small electrical unit that connects to a 12 volt power supply," Denham says. "The operator would simply fill his tank with water, plug the unit into the tractor, the Biofume patented Ozone unit has an inverter in line that connects to an ozone generator which creates a controlled electrical storm in a box creating ozone. This ozone gas is then injected into the water and applied."

The ozone line is attached directly into the sprayer pump. This ensures specific levels of ozone hitting the required target. The innovation means there is no mixing of ozone in the tank, prior to the actual spraying – removing any danger of gas build up.

The Judges at this year's Fieldays said the innovation has applications across multiple agricultural sectors.

"The company has taken some older technology and integrated it into a system that has shown some early promise of delivery of significant benefit to the industry. Their delivery mechanism allows ozone utilization in different agricultural areas, including cleaning, bacterial management and bleaching.

This minimizes the use of chemicals and reduces costs. Judges were confident applications across dairy, viticulture and horticulture will likely see benefits from this innovation."

But wait there is more. Not only is this a natural sterilizer that can kill all sorts of nasties in the vineyard, it may also have another application – bird control. Given the cost of netting and bird control to prevent berry damage as the fruit ripens, this could be a simple solution.

Denham says when they were conducting trials in kiwifruit orchards after the PSA outbreak, growers noticed the number of insects had diminished significantly. So too had the number of birds. Further research showed that birds with a highly tuned respiratory system do not like the smell of ozone. In fact they hate it. One sniff and they are off seeking out less gaseous pastures. Ozone gas pumped through PVC pipes are now keeping a number of commercial facilities in the country free from pesky birds nesting in their rafters.

Imagine if you could do something similar in your vineyard once veraison begins?

Plus there is the added advantage that any bacteria, fungus or mite that is in the flight path of the gas, would be killed instantly or deterred

There may be even more good news for growers from the ozone story.

Exposing fruit to a burst of ozone gas is similar to 'vaccinating' them against fungal attack, scientists at Newcastle University have found.

The team, led by microbiologist Dr Ian Singleton and plant biologist Prof Jerry Barnes, has shown that exposing tomatoes to ozone before infecting them with fungus, reduced lesion development by up to 60 per cent.

Admittedly tomatoes are very different to grapes – but it would be interesting to undertake research on the impacts of spraying fruit with ozone prior to PBC, to see if it helped provide a barrier within the skin of the grape against something like botrytis or powdery mildew.

The potential is huge and the best thing of all for growers contemplating the new technology, is it is clean, organic and sustainable, with no risk of residue.■

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