

Put the Brakes on Decay

Effective fungicide application on stone fruit

By Anna Mouton

Post-harvest decay of stone fruit can cause significant financial losses. Arrie de Kock, senior researcher at ExperiCo, explained how to prevent problems through an integrated approach that includes application of fludioxonil using atomisers.

"I don't think we can only talk about chemical control," said De Kock. Decay results from the perfect storm of interactions between the fruit, the fungal pathogen and the environment. De Kock outlined mitigation measures for each of these components.

Fungi that cause decay need a moist environment — avoid picking wet fruit or putting wet fruit over the pack line. Breaks in the cold chain will lead to condensation and increase the danger of decay. It's best not to store fruit under the dew point before packing. "And if a shrivel sheet will give good enough shrivel control, don't use a perforated bag, because the higher the humidity, the higher the decay potential," advised De Kock.

Decay pathogens are always present and it's important to reduce the number of spores that can infect fruit. Sanitation begins in the orchard with removal of mummies and damaged fruit and keeping the orchard floor clean. Packhouse sanitation is equally critical. Deprive spores of the chance to infect fruit by avoiding injuries. De Kock pointed out that control starts with harvesting fruit at optimal maturity —ripe fruit are at greater risk for damage and decay.

POST-HARVEST FUNGICIDE APPLICATION

"I'm going to talk specifically about atomiser systems," said De Kock. Coverage is key — atomisers must be calibrated to deliver 1.2 litres of fungicide mixture per tonne of fruit and this must be sprayed evenly across the pack line. The ideal droplet size is 200 microns.

Fludioxonil is currently the only fungicide registered for post-harvest use on stone fruit. It's supplied as a suspension concentrate and the fungicide mixture must be continuously stirred or mixed to keep the active ingredient from settling out.

Together with Ida Wilson, De Kock conducted a survey of post-harvest fungicide application practices at twenty packhouses across the fruit production area. The survey included an assessment of spray coverage by placing water-sensitive paper on the pack lines and measuring exposure time and fungicide residues. They identified a number of problems leading to poor fungicide deposition.

"There was uneven coverage in some cases," reported De Kock. Reasons included too few or incorrectly spaced nozzles, variation in delivery by different nozzles on the spray boom, and poor calibration. Spray drift occurred when the nozzles were not entirely covered by the cabinet.

The prescribed concentration of fungicide was not always used. "That could lead to low residues which are a waste of time because you will have poor decay control," warned De Kock. Overdosage can also be a problem as it can lead to rejections due to high residues.

Improper mixing was another source of incorrect



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LEFT Several fungal pathogens cause post-harvest decay in stone fruit.

concentrations, as were blocked nozzles. Blocked nozzles must be cleaned immediately — this should be easy and not require recalibration of the equipment.

De Kock recommends an application rate of 10 millilitres of fludioxonil per tonne of fruit. "It's also important to treat fruit as soon as possible after harvest," he stressed.

FACTORS AFFECTING FUNGICIDE EFFICACY

De Kock and Wilson conducted laboratory studies where fruit was inoculated with decay pathogens and then treated after three hours of incubation. Fludioxonil was effective at reducing decay in both nectarines and plums. Dip treatments worked better than the atomiser even though the final residues achieved with drip treatments were lower. De Kock stressed that higher residues don't amount to better decay control.

De Kock attributes the success of dip treatments to better coverage but believes atomisers are superior. The downside of dip treatments include wet fruit on the pack line and a dip mixture that becomes dirty and contains progressively less fungicide.

De Kock and Wilson investigated several variables that could affect residue levels. They found that exposure times of ten seconds resulted in the same residue levels as the recommended exposure time of thirty seconds. Extended exposure times of three and four minutes led to residues increasing by about thirty percent. "This means we must make sure the fruit doesn't stand under the atomiser when the pack line is switched off," said De Kock.

Harvest maturity and cultivar affects residue levels — Songold retains more fludioxonil than Laetitia — but adjustments to the fungicide dosage should not be necessary. The temperature of the fruit and the fungicide solution didn't affect residue levels in these experiments.

"If used correctly the application of fludioxonil with atomisers can be highly effective to control decay in stone fruit," concluded De Kock. **FQ**



Arrie de Kock
ExperiCo
Arrie@experico.co.za