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PACKINGHOUSE NEWSLETTER

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EFFECTIVE USE OF TRUCK BIN DRENCHERS FOR DECAY CONTROL

Treating fruit with a fungicide before degreening is an effective treatment for controlling *Diplodia* stem-end rot and green mold. Even after the degreening season, if delays between harvest and packing exceed 24 hours, a fungicide application before packing is needed to consistently control green mold. Truck bin drenchers offer an effective way of applying fungicides to pallets of fruit, and several of these are now in use within the industry for the application of benomyl.

Drenchers are only effective, however, if they are used properly. If correct conditions of benomyl and chlorine concentration, pH, and proper treatment time for thorough coverage are not maintained, the treatment can significantly enhance decay rather than control it.

Last season, we were able to work with the newly constructed drencher at Waverly Growers Cooperative to obtain information on the proper conditions for effective drenching. The drencher was designed to treat the load by moving the truck slowly through the drencher for a period of at least 3 minutes. Other systems have been designed to treat the entire load in place. The length of the treatment required for good coverage is specifically controlled with an automatic timer to eliminate operator error and to be more exact and consistent with the treatment. This system requires greater fungicide volume, pumps of higher capacity, and a larger overhead distribution system than the Waverly design.

Each truck load removed 30-40 gallons of fungicide suspension. To maintain the proper treating strength of 600 ppm, add-back concentrations of benomyl had to be maintained at 950 ppm. This concentration will vary some among drenchers depending upon how

effective benomyl is kept in suspension. The Waverly drencher had mechanical agitators in each of the 2 side tanks that ran continuously. All of the benomyl run-off from the truck returned back to a small undisturbed center tank where heavy sand particles settled quickly. Fungicide suspension flowed back to the 2 side tanks through PVC pipes. The center tank was cleaned several times before it was necessary to clean the entire system after treating 17,500 pallets of fruit. The fungicide suspension was allowed to drop to its lowest treating volume so that a minimum amount of fungicide had to be removed when the system was cleaned by a commercial septic tank company.

To maintain the necessary levels of chlorine, it had to be added continuously to the system. A minimum concentration of 25-50 ppm free (not total) chlorine was required in the drencher to keep the fungicide suspension sanitary. This prevented the build-up of sour rot, brown rot, and benomyl-resistant green mold in the fungicide suspension. Chlorine was cycled through the drencher 1-2 hours before start-up in the morning and then continuously during operation of the drencher.

The pH of the fungicide suspension should be maintained between 6.5 - 7.5. Below pH 6.5, the chlorine is more corrosive and volatile, and therefore, difficult to keep in solution and more irritating to the drench operator and truck driver. Above pH 8, part of the benomyl may convert to a non-fungicidal form, and the chlorine begins to convert to the less active hypochlorite ion.

Levels of chlorine and pH can easily be monitored with a kit and a pocket pH meter. All that is required is a chlorine kit which measures free chlorine over a range of 10-200 ppm, and a small pocket pH meter with calibration solution to calibrate the meter. Contact the authors for sources of the kit and meter if they are not available through your local suppliers.*

A simple field test to measure benomyl concentrations is not available. However, an easy reliable lab test requiring a UV-spectrophotometer (1,2) can be performed by your service company. Our experiences with the test consistently gave results within 50 ppm of a known benomyl standard over a range of 50-1300 ppm. A small sample (100 ml) was taken from the agitated drench suspension and filtered through a layer of cheesecloth to remove large pieces of debris. Since the suspension contains a mixture of benomyl and some of its breakdown product, MBC, the sample was autoclaved at 250 F for 1 hour to convert all of it to MBC. After cooling, the sample was shaken for 5 minutes and a 1 ml aliquot was added to 50 ml of 95% ethanol. The mixture was shaken an additional 5 minutes, filtered through coarse filter paper, and the absorbance was measured at 282 nm. The absorbance value was multiplied times 1143 to obtain the benomyl concentration in ppm. Concentrations of benomyl greater than 1300 ppm should be diluted before measuring.

To reiterate, drenching is effective only when done correctly. Otherwise, it will be costly because of the lack of improved decay control or the actual enhancement of decay.

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- * Editor's note to suppliers of this type of equipment. Send us descriptions of your equipment so that we may include you in our list of sources.

AVAILABLE PUBLICATIONS

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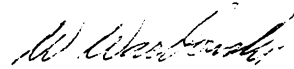
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