

# Annual Report - 2008

*Prepared for the California Pear Board*

Project Title: Evaluation of Postharvest Treatments for Management of Gray Mold, Blue Mold, and other Decays of Stored Pears in California

Project Leader: Dr. James E. Adaskaveg, Department of Plant Pathology, University of California, Riverside, CA 92521 (951) 827-7577

Cooperators: Dr. H. Förster (UC Davis), D. Thompson (UC Riverside), D. Felts (UC Riverside), L. Wade (Arysta Life Sciences)

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No funding was provided by the California Pear Board for this project in 2008. Still, we continued our evaluations on the efficacy of new postharvest decay control treatments of pears using different application methods. This was done to develop strategies to prevent resistance development in pathogen populations against the new postharvest fungicides as has occurred with thiabendazole. The development of additional postharvest fungicides is critical and timely, because the new treatments pyrimethanil (Penbotec), fludioxonil (Scholar), and fenhexamid (Judge; only effective against gray mold) were just recently fully registered in California and resistance has not been reported. In our studies on resistance potential in 2008, however, we demonstrated a high risk for resistance development against pyrimethanil and fludioxonil in populations of *Penicillium expansum* and other species of *Penicillium* infecting pear fruit. We have been working in close collaboration with the registrant of Scholar, Syngenta Crop Protection, that is very supportive of these studies. Evaluating the SBI difenoconazole, also a Syngenta product, we found it to be very effective against *Penicillium* decays. One goal of this collaboration are the evaluation of difenoconazole in a mixture with fludioxonil and to have the two fungicides eventually being marketed as a pre-mixture. This way, with every application, there is a reduced pressure for resistant individuals to be selected as compared to single-fungicide treatments.

To meet our goals, in 2008 we evaluated two new SC formulations of difenoconazole for their efficacy against postharvest gray mold and blue mold in high-volume T-jet applications. In addition, we also evaluated two new formulations of thiabendazole because recent regulatory changes require the re-formulation of many pesticides using inert ingredients that EPA has approved. As shown in Table 1, Scholar by itself at 150 ppm was a highly effective fungicide reducing the incidence and severity of blue mold and gray mold by over 90% as compared to the untreated control. Both formulations of difenoconazole also effectively reduced both decays, whereas Penbotec was somewhat less effective in this study. In comparing the three TBZ formulations, there was no consistent ranking, although the current commercial 340F formulation overall had the highest efficacy.

These results support our plans to get difenoconazole registered for postharvest use on pears through the IR-4 program. We will continue our studies with evaluating the compatibility of the two formulations with the SC formulation of Scholar.

**Table 1. Evaluation of postharvest fungicide treatments for control of blue mold and gray mold of Bosc pear**

No.	Treatment	<i>P. expansum</i> TBZ-S				<i>B. cinerea</i> TBZ-S			
		Inc. (%)	LSD	Sev. (mm)	LSD	Inc. (%)	LSD	Sev. (mm)	LSD
1	Control	97.2	a	13.5	a	34.5	a	6.3	ab
2	Scholar 230SC 150 ppm	5.6	c	0.8	c	2.8	c	1.1	c
3	Mertect 340 F 600ppm	9.1	bc	1.6	bc	5.6	c	2.2	bc
4	Mertect A10466 J 600 ppm	22.2	b	3.1	b	5.6	c	0.8	c
5	Mertect A10466 G 600 ppm	11.1	bc	1.3	c	19.4	ab	3.9	abc
6	Difenoconazole A8574B 600 ppm	8.3	bc	1.6	bc	11.1	bc	2.2	bc
7	Difenoconazole (Dividend) 600 ppm	5.6	c	0.9	c	11.5	bc	2.3	abc
8	Penbotec SC 500 ppm	13.9	bc	1.8	bc	25.0	ab	6.7	a

\* - Fruit were inoculated with *P. expansum* ( $10^5$  conidia/ml) or *B. cinerea* ( $5 \times 10^4$  conidia/ml) and treated after 13-15 h with aqueous solutions of fungicides using a T-Jet system with 2 sequential spray bars. Fungicide treatments were followed by a CDA application with Decco 231 carnauba fruit coating. Fruit were evaluated for decay after 5 days of incubation at 20C.