

Title Effect of fludioxonil on germination and growth of *Penicillium expansum* and decay in apple cvs. Empire and Gala

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### Abstract

*Penicillium expansum* is the predominant fungal pathogen responsible for blue mold of apple. The sensitivity of three thiabendazole-sensitive (TBZ<sup>S</sup>) and three thiabendazole-resistant (TBZ<sup>R</sup>) isolates of *P. expansum*, collected from apple stores in Ontario, to fludioxonil was determined in vitro (conidial germination and colony diameter on fludioxonil amended medium) and in vivo (apples). On fungicide amended medium, the concentration of 50% inhibition (EC<sub>50</sub>) of germination for the TBZ<sup>S</sup> and TBZ<sup>R</sup> isolates of *P. expansum* ranged from 0.079 to 0.113 µg a.i. of fludioxonil/ml and for mycelial growth from 0.013 to 0.023 µg a.i. of fludioxonil/ml. Harvested apples were wounded and co-treated with a suspension of conidia of *P. expansum* and the fungicides by drenching. Fludioxonil at a concentration of 100 µg a.i./ml was found effective against blue mold induced by both TBZ<sup>S</sup> and TBZ<sup>R</sup> isolates of *P. expansum* on apple cv. Empire. In post-inoculation treatments, wounded apples were inoculated with *P. expansum* and incubated for 18–20 h at 13°C, and then drenched with appropriate concentrations of fungicides and incubated at 20°C for 6 days. Fludioxonil at a concentration of 100 µg a.i./ml controlled blue mold in the co-treatment and in the post-inoculation treatment on cvs. Empire and Gala. The activity of fludioxonil on two or more stages, conidial germination and mycelial growth, of life cycle of *P. expansum* and on decay formation in two cultivars of apples suggests that this compound potentially can provide an alternative to TBZ in post-harvest control of blue mold of apple, where any TBZ<sup>R</sup> conidia are present.