

Section III
Biological & Cultural Control

**Efficacy of *Metarhizium anisopliae* as a Curative Application for Black Vine Weevil
Infesting Container-Grown Nursery Crops**

Denny J. Bruck
USDA-ARS Horticultural Crops Research Laboratory
3420 N.W. Orchard Avenue
Corvallis, OR 97330
(541) 738-4026
bruckd@onid.orst.edu

The black vine weevil (BVW), *Otiorhynchus sulcatus* (F.) (Coleoptera: Curculionidae) is a serious pest of nursery crops. The fungus, *Metarhizium anisopliae* (F52), is registered by the US Environmental Protection Agency for BVW control. The objective of this study was to determine the efficacy of a curative drench application of *M. anisopliae* for BVW larval control in container-grown nursery plants. Trials were performed in the spring of 2004 and 2005 as well as the fall of 2006. Laboratory studies were also performed to quantify the impact of temperature (10, 15, 20, 24 and 28°C) on fungal growth and speed of kill. *Metarhizium anisopliae* applied in the greenhouse and outdoors in 2004 were 92 and 30% effective, respectively. Fungal drench applications to container-grown plant material maintained outdoors in the spring of 2005 were nearly 100% effective 28 days after application. Fall applications in 2006 provided statistically significant reductions in the number of live BVW larvae per pot, but were not as effective as spring applications in 2005. The mean media temperature of containers maintained outdoors in the fall of 2006 dropped considerably (10-12°C) over the course of the experiment. Laboratory experiments demonstrated that temperatures below 20°C significantly retarded fungal growth and the speed at which *M. anisopliae* infected BVW larvae. When soil temperatures were adequate (16°C) topical drench applications of *M. anisopliae* were very effective at eliminating BVW infestations in container-grown nursery plants. The use of *M. anisopliae* curative drench applications have similar limitations as the use of nematodes for BVW control in regards to soil temperature. Therefore, applications will have to be made as early in the fall as possible once egg laying has ended or potentially late in the spring just prior to pupation.