

# Assessment of insecticides for control of *Haploxius crudus*, the vector of lethal bronzing

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## ABSTRACT

Lethal bronzing (LB) is a fatal phytoplasma infection of a variety of ornamental palms in Florida and is a significant threat to the green industries. Current management has emphasized rapid removal of infected palms and preventative inoculations of the antibiotic oxytetracycline (OTC) but little has been done in terms of management of the insect vector, *Haploxius crudus*. In this study, the efficacy of three different formulations of imidacloprid were

evaluated for their potential to kill adults of *H. crudus*. It was determined that a broadcast spray and soil drench were highly effective at killing *H. crudus* while the granular formulation showed no difference relative to the control palms. These findings are valuable in that they demonstrate the efficacy of imidacloprid against *H. crudus* but also show potential in reducing disease spread.

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## METHODOLOGY

Objective 1: Evaluate efficacy of 75WSP as soil drench against *H. crudus*.

Objective 2: Evaluate efficacy of 2F as broadcast spray against *H. crudus*.

Objective 3: Evaluate efficacy of Merit granular treatment against *H. crudus*.

Three different treatments were established on seedlings of *Phoenix sylvestris* (**Figure 1**) using imidachloprid based on formulation. Products used were Merit granular at 0.2g/0.02m<sup>2</sup> per pot, 2F applied at turf rate as broadcast spray (0.6 oz/1000ft<sup>2</sup>), and 75WSP (17ml in 1 gallon of water, 250 ml applied per pot as a soil drench). Each formulation was replicated 10 times. 10 control pots with no insecticides were used for comparison and to assess natural mortality from bring wild caught individuals from the field. All plants were treated 2 weeks prior to addition of *H. crudus* to allow for insecticides to become systemic in plants. 20 adults were used per plant. Mortality was recorded hourly for first 6 hours then daily until all adults on control plants were dead.

# RESULTS



Significant mortality in adults of *H. crudus* was observed within the first 24 hours for 75WSP and 2F treatments with 55% and 35% mortality within 6 hours, respectively, compared to 20% and 13% mortality for the control and merit treatment, respectively (**Figure 2**). At 24 hours post exposure, approximately 92% and 86% were dead for the 75WSP and 2F treatments, respectively, whereas there was about 42% and 34% mortality for control and merit treatment (**Figure 2**). For the 75WSP treatment, 100% mortality was attained at 4 days, 6 days for the 2F treatment and 17 days for the control and merit treatment (**Figure 2**).

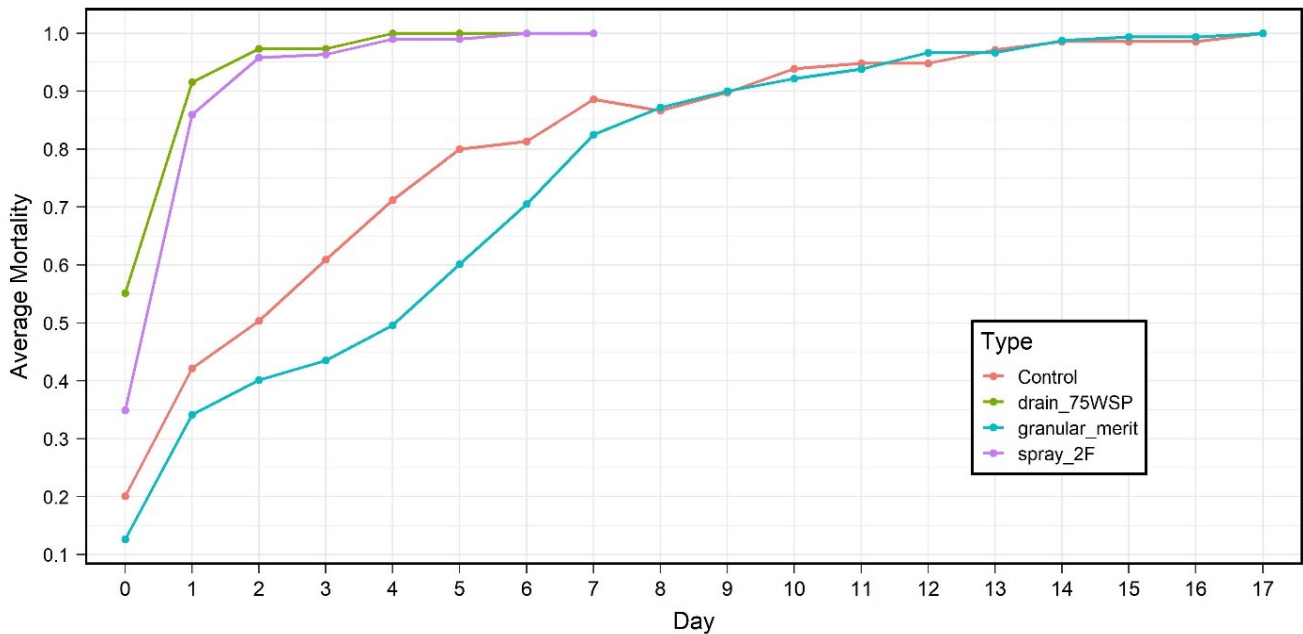


Figure 2. Mortality data for *H. crudus* for all three formulations of imidacloprid on palm seedlings of *Phoenix sylvestris*

# CONCLUSIONS

These data indicate that imidacloprid is highly effective at killing *H. crudus* when applied to palm seedlings as a spray and soil drench but not effective in granular formulation. While these insecticides are registered for use on turf grass, these data are still highly relevant because the immature stages of *H. crudus* are strict grass feeders and persist in the thatch layer of a wide variety of grasses and sedges in Florida. The application of these insecticides on turf grass to control a variety of turf pests and will also target nymphs of *H. crudus*. In addition, if insecticides are applied near palms, the uptake of these insecticides in palms will also grant a degree of protection from infection by LB. It has been determined that optimal acquisition time for LB is 5 days and since the 75WSP killed 100% of *H. crudus* at 4 days, it indicates that palms with imidacloprid in the field will likely result in the death of *H. crudus* prior to it acquiring or transmitting any phytoplasma. Future studies need to assess injection technologies and assess uptake of the above formulations in other palm species to verify efficacy is consistent among different palm species important for the green industries of Florida.

