DOSE RESPONSE OF WEED SEEDS, NEMATODES, AND PATHOGENS TO TWELVE RATES OF EDN

Husein Ajwa*[1], S.Thalavaisundaram[2], Michael Stanghellini[3]

[1]University of California, Davis, CA; [2]Draslovka Services Pty Ltd. North Melbourne, Australia; [3]TriCal, Inc., Gilroy, CA

The objective of this study was to develop EDN dose-response curves (24-hr exposure LC_{50} and LC_{90} values) for pathogenic fungi, parasitic nematodes, and weeds.

In this laboratory study, weed seeds, nematodes, and fungal pathogens were placed in jars with two soil types and treated with known amounts of EDN. Because EDN degradation is affected by soil pH, two soils that have different pH values (Florida soil with a pH of 5.6 and California soil with a pH of 7.6) were used in this study. Approximately 320 g - soil was placed in a glass jar and the moisture content was adjusted to 70% of the soil field capacity. Infested soils with four pathogenic fungi (*Fusarium oxysporum, Pythium ultimum, Macrophomina phaseolina,*and *Verticillium dahlia*), two nematodes (*Meloidogyne hapla* and *Globodera rostochie*), and four weeds were prepared in separate mesh bags and placed inside the glass jars. The weeds were little mallow (*Malva parviflora*), common purslane (*Portulaca oleracea),* common chickweed (*Stellaria media*), and yellow nutsegde (*Cyperus esculentus*).

Infested soils inside the glass jars were pre-incubated for 24 hours at 20°C. EDN gas was applied through a septum at the following doses: 0, 0.0088, 0.022, 0.044, 65.7, 87.6, 109.5, 218.9, 437.8, 656.7, 1094.5, 1751.2 mg/Kg soil. The vessels were incubated at constant temperatures (20°C) for 24 hours and then ventilated for 12 hours under a fume hood. The mesh bags were assayed for pathogen, nematode and weed mortality.

Logistic dose-response models were used to estimate the effective concentration necessary to reduce soil pest viability by 50% (LC_{50}) or 90% (LC_{90}) percent using SAS probit procedure. For example, LC90 for *Fusarium oxysporum* was 96 mg/kg (Figure 1). The LC_{50} and LC_{90} for the various fungal pathogens, nematodes, and weed seeds in two soil types will be presented.

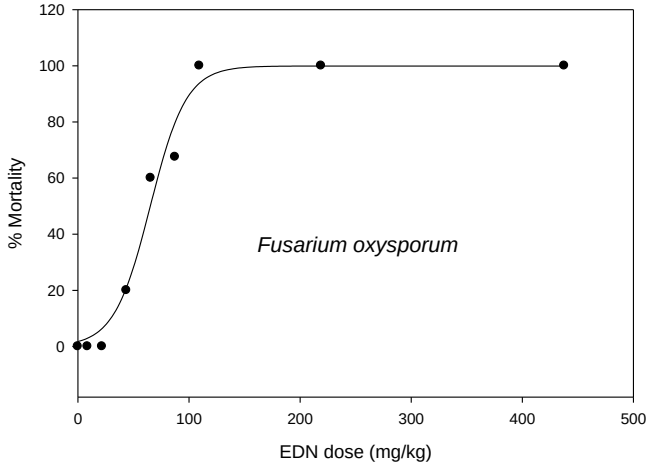

Figure 1. Logistic curve for *F. oxysporum* mortality.