What Is Triclosan?

Triclosan (TCS) is a synthetic broad-spectrum antimicrobial agent that has been used in consumer products for over 40 years. The Environmental Protection Agency classified TCS as a pesticide in 1969.

**Why Be Concerned?**

With unregulated sales to consumers it has become a common contaminant (Ying 2007). Wastewater treatment plants only remove a portion of the TCS due to its limited biodegradability (Miege 2009, Ternes 2004).

The Focus of the Research

This study investigates the effect of TCS on soybean (Glycine max) nodule formation, biomass production, and reproductive fitness (pods produced). The concentrations studied were similar to those found in natural ecosystems (U.S. EPA et al., 2009).

Materials & Methods

- 12 hour light cycle (3x 400 watt HPS lamps)
- 1 control and 3 treatments
  - 2.62 x 10^{-4} ratio of TCS in soap/soil
  - 1 x 10^{-3} ratio of TCS chemical/soil
  - 1 x 10^{-2} ratio of TCS chemical/soil

Results and Discussion

The TCS treatments significantly diminished nodule number, pod number, and biomass (see graphs), with the highest concentrations of TCS having the most severe effect. The slight reduction in trait values in the soap + TCS treatment versus the control was not significant.

This shows that TCS at concentrations similar to those found in natural ecosystems can have significant and severe effects on plant growth and reproductive fitness. The reduction in nodulation suggests that the *Rhizobium* bacteria are affected by the TCS treatments, although a direct effect of TCS on root growth cannot be dismissed.

References


