



## USDA-CSREES 2005 National Water Quality Conference

### Temporal Variation in Mixture Toxicity of Organophosphate Insecticides and Atrazine on Fatheads Minnows

*Abstract:*

*Organophosphate insecticides (OP's) are often used in agricultural and residential settings. Atrazine is also widely used in agriculture being the most heavily applied herbicide in the United States. These chemicals are often found in run-off water at elevated levels, causing exposure to non-target species. Past research has shown greater than additive toxicity when invertebrates were exposed to mixtures of atrazine and OP's. This study expanded the previous knowledge base into vertebrate species, specifically the fathead minnow. Groups of known age fathead minnows, *Pimephales promelas*, (1, 17 & 53 d post hatch) were exposed to the OP diazinon, in binary mixtures with atrazine. These tests were performed using static renewal methods with the endpoint being the 96 h LC<sub>50</sub>. Temporal variations were seen in the organisms' response to the OP in a laboratory setting with younger organisms being significantly less sensitive to the chemical mixtures, with the oldest organisms being adversely affected at the lowest concentrations. These findings have been supported by acetylcholinesterase activity of whole fish homogenates. The affect of atrazine on organophosphate toxicity was not shown in this study. These results may have ramifications concerning early life cycle testing of fathead minnows.*

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