Proposal No. _____

The Andersons Research Grant Program
Team Competition

Project Title:

Ozonation of Corn, Wheat and Barley for the Control of Pests and Spoilage Agents, and the Removal of Off-Odors in Commercial Grain Storage Structures

Principal Investigator(s)

Name	Institution/Agency/Other
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Period of Proposed Project Dates:

Beginning: ____September 1, 2005_____ Ending: _____August 31, 2007_____

Amount Requested (maximum $75,000 per year for two years):

Year 1: _____$75,000_____ Year 2: _____$75,000_____

Problem Identification and Related Research:

Currently, there is a substantial interest in the application of ozone by the U.S. grain industry. Ozone is a powerful oxidant that has regulatory acceptance by the FDA (FDA 2001). EPA's MSDS defines it as "pure air". Numerous beneficial applications have been developed, such as water treatment to disinfect and eliminate odors, taste, and color, as well as to remove pesticidees, inorganic and organic compounds (Legeron 1984, Suffet 1986, EPA 1999, Gottschalk 2000). Ozone (O_3) is an allotrope of oxygen, which can be generated by electrical discharges in air. Ozone has a half-life of 20-50 min, and rapidly decomposes to diatomic oxygen, a natural component in the atmosphere. Because ozone can be easily generated at the treatment site using only electricity and air, it offers several safety advantages over other post-harvest treatments such as conventional pesticides. First, there are no stores of toxic chemicals, chemical mixing hazards, or disposal of left over insecticides or containers (Law and Kiss 1991). Second, with a short half-life, it reverts back to naturally occurring oxygen. Third, if needed it would be possible to neutralize ozone through techniques such as thermal activated charcoal, as well as catalytic and chemical abatement (Law and Kiss 1991).

Research on the efficacy of ozone on insect mortality indicated 92-100% mortality of