Synergistic Effect of Temperature and Ozone on Management of Adults of *Oryzaephilus surinamensis* (Coleoptera: Silvanidae) Infesting Rice Seeds

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ABSTRACT

The efficacy of ozone gas (approximately 600 mg/ h) at different temperatures was evaluated against the adult saw-toothed grain beetle (SGB), *Oryzaephilus surinamensis,* on rice seeds. Laboratory experiments were conducted to assess the effects of four ozone exposure durations (1, 2, 3, and 4 hours) at five temperatures (25, 30, 35, 40, and 45°C). The results indicated that Ozone exposure significantly increased the mortality of adult SGB at all exposure intervals compared to non-exposed groups. Mortality rose from 11.46% to 50.00% after 4 hours of ozone exposure; however, non-exposed mortality remained low. Temperature also had a significant effect; the mortality increased from 9.38% at 25°C to 74.50% at 45°C. The combined high temperature and ozone produced a synergistic effect, leading to 100% mortality at 40°C and 45°C within 2 hours. These findings demonstrate that temperature enhances the efficacy of ozone as an eco-friendly pest control strategy for controlling *O. surinamensis* adults.

Keywords: Management, *Oryzaephilus surinamensis*, Ozone gas, saw-toothed beetle, Temperature