

## **Efficacy of fumigant hydrogen cyanide to control *Tribolium confusum* under laboratory and field conditions**

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### **Abstract**

*Tribolium confusum* is difficult to exterminate. We measured the concentration time product (Ct-P) achieved during hydrogen cyanide (HCN) fumigation and examined whether the Ct-P levels in real-world mills are sufficient to control field strains of *T. confusum*. Using an originally constructed, gastight fumigation chamber, it was estimated that the Ct-P required for a complete kill of the field strain of *T. confusum* was 4x higher than the levels required to kill the laboratory strain. The Ct-P reached during real-world mill fumigations with HCN were less than half of the labelled HCN rate. Nevertheless, the current HCN dosage is still sufficient since the Ct-P reached during real-world mill fumigations was at least 99x higher than that required to exterminate the lab strain and 18x higher than that required for the field strain. These results were confirmed in mill validation testing, where 100% mortality of *T. confusum* adults was achieved.

Keywords: hydrogen cyanide, fumigation, *Tribolium confusum*