

Title Synergistic effects of insect-resistant maize and *Teretrius nigrescens* on the reduction of grain losses caused by *Prostephanus truncatus* (Horn.)

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Abstract

Prostephanus truncatus is a pest that causes serious losses in stored maize (*Zea mays* L.) especially in developing countries. This research was conducted to investigate the use of post-harvest insect resistance maize in combination with biological control of *P. truncatus* by the predator *Teretrius nigrescens* to reduce maize storage losses. We studied the population dynamics of *P. truncatus* with and without a predator in combination with susceptible maize and resistant maize to insects under laboratory conditions. This study confirms that P84c3 is a resistant variety against *P. truncatus*. Maize resistant kernels had a reduction of 30% losses in comparison with susceptible kernels. Significant and favorable interactions were observed between P84c3 maize and presence of *T. nigrescens*. A dramatic reduction of 80% in progeny number, 81% grain weight loss, and 75% frass production caused by *P. truncatus* was observed when the predator was used in combination with P84c3. Resistant maize reduced the prey development time and consequently the insect density allowing the predator to control more effectively the population. Prey/predator proportion on resistant maize was significantly higher in comparison with susceptible kernels; thus, giving a more effective pest population control by the predator. These results demonstrated that the combination of post-harvest insect resistance maize with the predator *T. nigrescens* reduces grain maize losses by *P. truncatus*.