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Killing stored grain pests by radio frequency and its effect on grain quality

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ABSTRACT

In this study, four radio frequencies (RFs) were studied for insecticidal effect. Eexperiments were carried out on different insect species, and the insecticidal effect in paddy with different moisture content was studied. The results showed that when heated to 58℃ by RF without heat preservation, the mortality of *Rhyzopertha dominica* (F.) (Coleoptera: Bostrychidae) adults reached 100%. It took at least 8 min to reach the lethal temperature of *R. dominica* at 40.68 MHz. The main influencing factor of insecticidal rate in different grain varieties was the density of the grain. The higher density, faster was the insecticidal effect. Under the condition of 27.12 MHz, the time needed to increase mortality was not linear with the increase of moisture content of paddy. Furthermore, paddy after RF treatment had no significant effect on processing quality, storage quality and seed quality. These studies provided alternative physical methods for killing stored grain pests to replace chemical fumigation.

Keywords: Radio frequency, Stored grain pests, Insecticidal effect, Quality