

Identification of stored-grain insects using microwave/RF electric fields

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Abstract

Identification of the species and quantities of seven stored-grain insects were investigated with a new measuring method using a sensor and an electric field device in the frequency range of 0.3MHz to 1200MHz.. Three different constant voltages, 0, 20, and 40V and three different frequencies, 0.01Hz, 0.5MHz, and 5MHz alternating electric fields were tested to address the possibility of improving the identification of insects. Frequency ranges were optimized to maximize the identification and detection recognition rate using neural network techniques. Strong recognition rates of identification of species and quantities of insects were achieved at the band-pair (660.1 and 768.1 MHz) under 0, 20, and 40V constant electric fields and at the band-pair (174.3 and 432.2 MHz) under 0.01Hz, 0.5MHz, and 5MHz alternating electric fields. (Jones et al., 2009; Ding et al., 2009)

References

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