

DEVELOPMENT OF A RAPID METHOD TO DETERMINE INSECT INFESTATION IN GRAIN BINS WITH ELECTRO-ACOUSTIC DEVICES

F. Fleurat Lessard and A.J. Andrieu

INRA, Laboratoires des Insectes des Denrées, Pont de la Maye, France

Abstract

An assessment technique useful both for evaluating the hidden infestation in grain samples and for monitoring insect infestation activity inside the bins has been developed at the laboratory of stored products entomology and acarology in Bordeaux, France. First a study was conducted to determine the suitability of different acoustic or vibration sensors currently available for this purpose, and then an electro-acoustic device was used to monitor the typical signals produced by the activity of the insects when they feed or move inside the grain or the bulk of grain respectively.

One possible application of such a method of insect detection was to solve the problem of hidden infestation in samples of grain. A portable device was designed with up-to-date technology for detection of the presence of insects in grain samples during deliveries of grain, especially for milling. Also, wheat bins were equipped with a network of sensors for monitoring population increase of the granary weevil and rice weevil during storage periods of up to one year on a pilot scale.

The lowest level of infestation to be detected is five larval instars or one adult per kg of grain in the two above cases. With the silo-detection device, in a bin without sampling, the monitoring of insect infestation is very accurate and insect presence is detected long before the infestation becomes a risk for long term storage.