

LISTENING FOR INSECTS: ACOUSTICS, NON-DESTRUCTIVE DETECTION OF SOIL INSECTS

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From the beginning of soil entomology, the only sure way to know if you had a soil insect problem would be to dig the plant and examine the roots. This was accepted and in many cases, particularly if the grower or advisor did not want to destroy the plants, pesticide was applied at even the minute possibility that there may be a problem. Many other procedures have been tried, i.e. x-rays, infrared photography, atomic labeling, water and other types of floatation and heat sensing. However, all of these and others not mentioned have been useful academically but not useful for business. We had a need to find insects, *Otiorhynchus* spp., in nursery containers. Wholesale nursery is the #1 business in Oregon and high on the business scale in Washington. These nurseries ship to most other regions of the country and the world. State and nursery self-imposed 0-tolerance quarantines against shipment of container stock that may have larvae or adults of *Otiorhynchus* spp. results in economic hardship for originating nurseries. Thus, many nurseries now have scouting procedures that utilize destructive sampling. Acoustic detection has been used successfully with detection of termites inside of wood, with larvae inside of citrus, and with detection of stored grain pests. Several years ago it was used for detection of the very large larvae of *Diaprepes abbreviatus*. Each insect group makes relatively distinct sounds (from movement, chewing and other processes) and insect sounds can often be distinguished from other creatures, worms, slugs, etc. in the soil. Here we detail the status of a portable acoustical method to detect larvae of *Otiorhynchus* spp. in nursery containers ranging from 4 – 40 l volume. We also describe the progression of this instrument and procedures from the confines of a special acoustical room to being able to use a portable instrument in greenhouses and out-of-doors. We are now ready to train scouts, managers, and inspectors in the use of this equipment and procedures.