ABILITY OF TRAINED SCENT DETECTION DOGS TO DETECT GRAIN WEEVIL IN WHEAT SAMPLES

A JUSON AND C JUSON

Merlin Environmental Solutions Ltd. PO BOX 112, Carshalton, Surrey SM5 4XT. UK

Abstract Cereal grains are the major source of food for humans and most domesticated animals. In many developing countries, overall post harvest losses of cereals of between 10–15% are fairly common. The grain weevil, *Sitophilus granaries* is a pest of wheat, oats, rye, barley, rice and corn. Grain weevils cause significant damage to harvested stored grains and may drastically decrease yields. They are hard to detect and usually all of the grain in an infested storage facility must be destroyed. In common with other grain boring species, its larval stage is concealed within the grain, feeding on the germ, only becoming apparent after pupation. Currently on farms, manual samples, traps, and probes have been used to determine the presence of insects. These methods are not efficient and are time consuming. At the industrial level, acoustic detection, carbon dioxide measurement, uric acid measurement, near-infrared spectroscopy, can be used to detect insects in grain samples however these methods are cost prohibitive and not widely available in the developing world. The use of scent detection dogs for the monitoring of wood destroying insects and certain parasites of man is widespread and highly successful, however their role in stored product pest management has not been investigated. Dogs were trained as part of this study to detect grain weevil larvae and adults using a toy and verbal/physical interaction reward system. Their efficacy was tested with adult grain weevils and larvae placed in vented polycarbonate containers under controlled test conditions. Dogs were able to discriminate grain weevil samples from *Blattella germanica*, and *Callosobruchus maculatus*, with a 96% positive indication rate (correct indication behaviour from dog when target present) and 0% false positives (incorrect indication of when not present). Under controlled conditions using infested wheat samples from captive colonies, dogs were 92% accurate in locating live grain weevil larvae prior to pupation at infestation levels as low as 1 infested grain per 100ml of wheat. If trained properly, dogs can be used effectively to locate live grain weevil larvae in stored wheat crop prior to pupation. They could offer a fast and cost effective addition to integrated pest management programmes and subsequently reduce grain losses.