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Fire Ant-Detecting Canines: A Complementary Method in Detecting Red Imported Fire Ants

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Abstract

In this investigation, detection dogs are trained and used in identifying red imported Þre ants, Solenopsis invicta Buren, and their nests. The methodology could assist in reducing the frequency and scope of chemical treatments for red imported Þre ant management and thus reduce labor costs and chemical use as well as improve control and quarantine efÞciency. Three dogs previously trained for customs quarantine were retrained to detect the scents of red imported Þre ants. After passing tests involving different numbers of live red imported Þre ants and three other ant speciesÑCrematogaster rogenhoferi Mayr, Paratrechina longicornis Latreille, and Pheidole megacephala F.Ñplaced in containers, a joint Þeld survey for red imported Þre ant nests by detection dogs and bait traps was conducted to demonstrate their use as a supplement to conventional detection methods. The most signiÞcant Þndings in this report are 1) with 10 or more red imported Þre ants in scent containers, the dogs had 98% chance in tracing the red imported Þre ant. Upon the introduction of other ant species, the dogs still achieved on average, a 93% correct red imported Þre ant indication rate. Moreover, the dogs demonstrated great competence in pinpointing emerging and smaller red imported Þre ant nests in red imported Þre ant-infested areas that had been previously conÞrmed by bait trap stations. 2) Along with the bait trap method, we also discovered that 90% of red imported Þre ants foraged within a distance of 14 m away from their nests. The results prove detection dogs to be most effective for red imported Þre ant control in areas that have been previously treated with pesticides and therefore containing a low density of remaining red imported Þre ant nests. Furthermore, as a complement to other red imported Þre ant monitoring methods, this strategy will significantly increase the efÞcacy of red imported Þre ant control in cases of individual mount treatment.

Key words：Red imported Þre ant; Bait trap station; Detection dog; Odor recognition; Fire ant detection