

Title : The Development and Application of New Technology in the Monitoring and Control Techniques of Red Imported Fire Ant

Speaker : Chung-Chi Lin (Professor, Department of Biology, National Changhua University of Education, Changhua, Taiwan)

Related RISH mission : Mission 5 (Quality of the Future Humanosphere)

Abstract :

This seminar is to introduce the application of novel technologies in managing red imported fire ants (hereinafter referred to as fire ant) in Taiwan. The unmanned aerial vehicle (UAV) is employed to monitor fire ants and also to facilitate area-wide broadcast of toxic bait, especially for infestations located in challenging terrain (e.g., personal property without access, hillside or riverbank). A high-resolution camera that provides multispectral/hyperspectral/near infrared imaging capabilities is mounted on a UAV that flies over the target area at a height of roughly 20-50 m. Fire ant nests are detected based on the reflectance spectrum of a nest relative to surrounding areas, and the efficiency of detection is enhanced by the AI-powered image recognition system. Using UAV to broadcast toxic bait has reduced the need of manpower, amount of bait and cost while increased the accuracy of bait treatment that collectively lead to a better control outcome. We also developed and manufactured a novel lure station and trap using 3D printing technology (Fig. 1), and both are now incorporated in the current fire ant control framework in Taiwan. A cellphone application incorporated with the AI image recognition system is now being developed and expected to assist in field identification of fire ant, particularly for those front-lined fire ant management practitioners as well as general public.

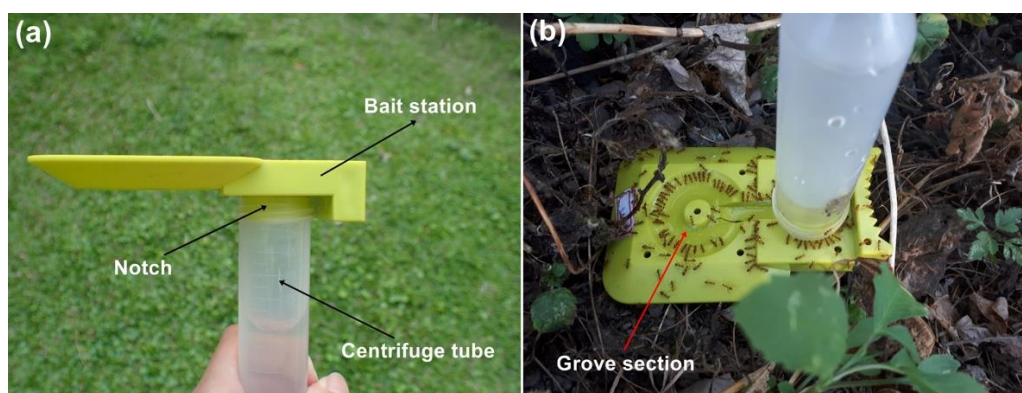


Fig. 1 Bait station device manufactured by 3D-printing (a) and workers of red imported fire ants feeding on 10% sucrose solution at the device (b).