



**XI ENCONTRO BRASILEIRO DE ECOLOGIA QUÍMICA**  
**XI BRAZILIAN MEETING ON CHEMICAL ECOLOGY**

October 23-26, 2019

Maceió, Brazil

**DEVELOPING SMARTER SOLUTIONS FOR ENSURING CROP AND  
LIVESTOCK HEALTH BASED ON CHEMICAL ECOLOGY.**

*Michael Birkett.*

Biointeractions and Crop Protection, Rothamsted Research, West Common, Harpenden, Hertfordshire, AL5 2JQ. United Kingdom.

**KEYWORDS:** HOST; PEST; ATTRACTANT; REPELLENT; VOLATILE; PHENOTYPE.

**ABSTRACT:** Invertebrate arthropod pests (insects and arachnids ie. ticks and mites) use their sense of smell to detect and locate suitable hosts (plants, animals) for feeding prior to reproduction and for oviposition. The odour of hosts comprises of attractive and repellent volatile organic compounds (VOCs), and it has been shown that hosts that are more resistant to pests produce higher levels of repellent VOCs, compared to those hosts that are less resistant. This ecological interaction can be exploited in crop and livestock protection by using attractive VOCs to pull pests into traps, using repellent VOCs to push pests away from hosts, and using both sets of VOCs at the same time eg as part of a push-pull strategy. Although the use of synthetic attractive and repellent VOCs in pest management has been explored, this technology is not always sustainable for extensive or smallholder crop and livestock production systems because protection can be short-lived or difficult and expensive to deliver. A further development of the use of VOCs is that they can be delivered by the hosts themselves, eg by deployment of botanically-derived attractants, and by breeding/selection of hosts with altered volatile phenotypes. The prospect of exploiting botanically-derived attractants and host volatile phenotypes for ensuring crop and livestock health will be discussed with a focus on three major pests affecting tropical and sub-tropical agriculture.