

How subterranean termites find food

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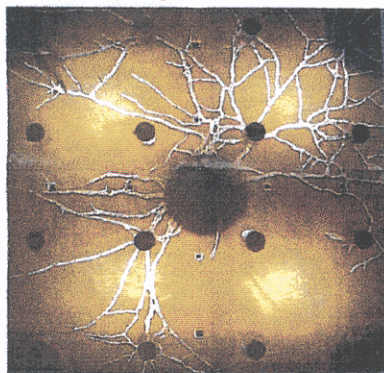
Gaining a better understanding of how subterranean termites tunnel in search of food has become critical as treatment strategies continue to focus more on baits and using slow-acting pesticides that can be spread through the colony, rather than on simply keeping the termites away with repellent insecticides. Exactly what termites are doing under the soil has been somewhat of a mystery, but scientists at the University of Hawaii are seeking to shine light on the termites' secrets by studying their behaviour in two-dimensional foraging arenas.

Designed like horizontal ant farms, plexiglass sheets containing thin layers of moistened sand are providing windows into the world of termite tunnelling and food searching behaviour. Early research using these arenas determined that in the absence of anything in the soil termites constructed tunnels in a systematic fashion that divided their search area up into equal parts. The soil environment, however, is rarely uniform - especially in an urban environment. So more recently, researchers at the University of Hawaii have used the arenas to simulate a situation in which Formosan subterranean termite foragers encounter multiple objects in the soil. They discovered that indeed, before en-

countering any object, termite tunnels divided the area up like spokes of a wheel showing equal preference for all directions. However, when termites found either food (wood) or a hollow space in the soil, tunnelling activity was shifted to the area surrounding that spot and ceased in areas where nothing had been encountered. Bursts of radial tunnels were repeated at each encounter before object and lead to subsequent encounters with nearby objects. Apparently, both finding food and possible nesting areas (hollow spaces) in the soil causes the termites to tunnel out again

searching for more food in that immediate area. This knowledge could be applied to termite control by helping to determine where to place baits or insecticide applications to maximise the probability of a termite encounter.

University of Hawaii researchers are now using these same sorts of plexiglass arenas to study termite foraging at natural outdoor locations. Results from this research will continue to be used to improve the effectiveness of termite control methods and assist in the development of new techniques that exploit termite behaviour to their own demise.



Looking down on an experimental termite foraging arena. Termites tunnel outward from the centre, encounter wood in the sand, and tunnel outward again from those locations.

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