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Pharaoh Ants

(and Ghost Ants)

Matt Green
Principal Entomologist

Who are you, why are you here?

I work in the UK in the entomology laboratory

We work for all of Rentokil, not just the UK

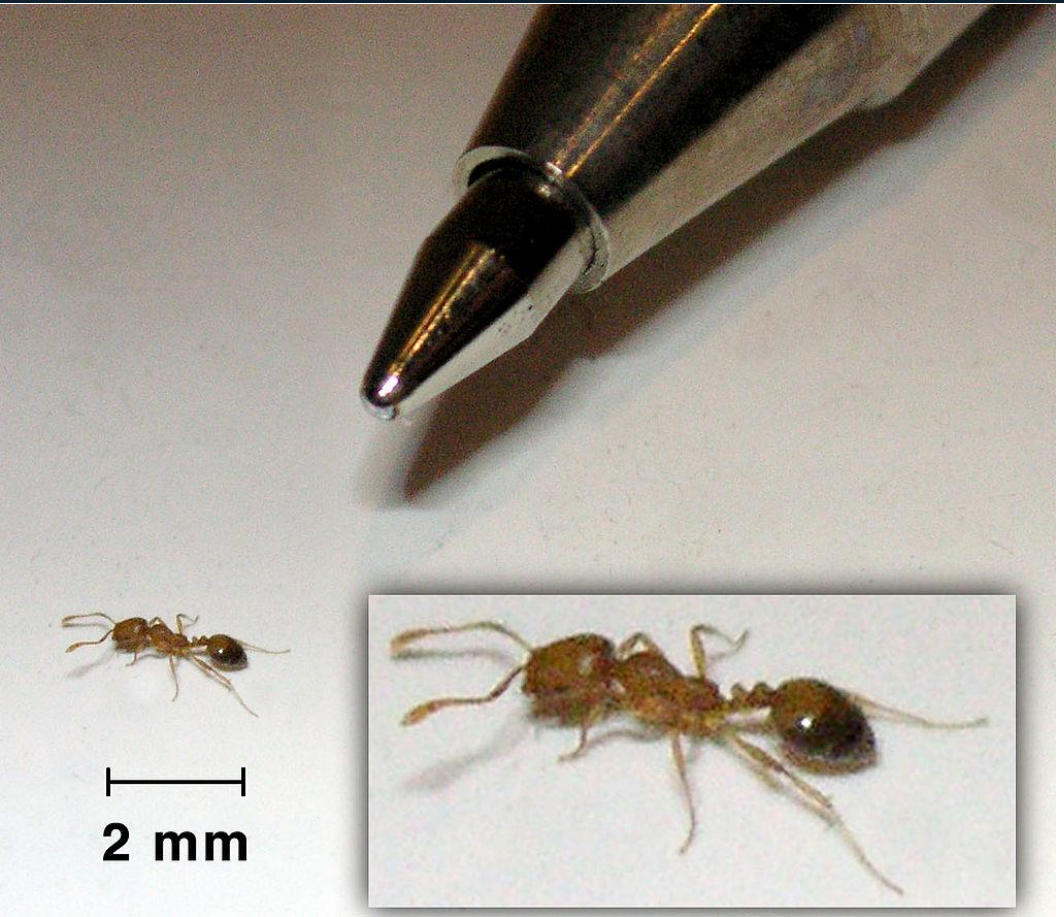
We keep 40+ species of urban pest insects

We:

Create new things
Test 3rd party products*
Support the businesses by doing things like this

*I spend *a lot* of time testing UV light traps and bed bug traps...

The basics



Pharaoh's Ant
Monomorium pharaonis

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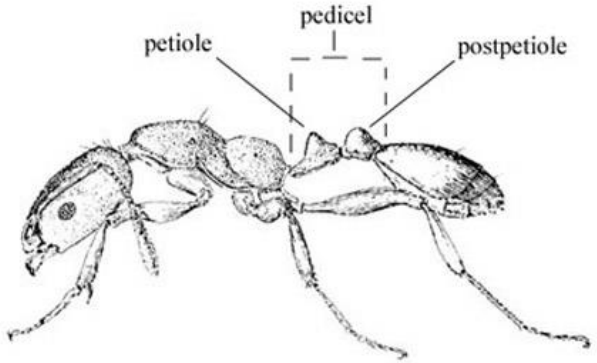
Ideal camera work

Uneven thorax with no spines

Two-node segmented pedicel

Pale yellow to reddish body colour with a darker abdomen on the top and rear



Usual camera work

Three segments in the antennal club

Two-node segmented petiole

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Ghost Ant (*Tapinoma melanocephalum*)

Twelve segmented antenna, no distinct club

One node segment petiole, hidden

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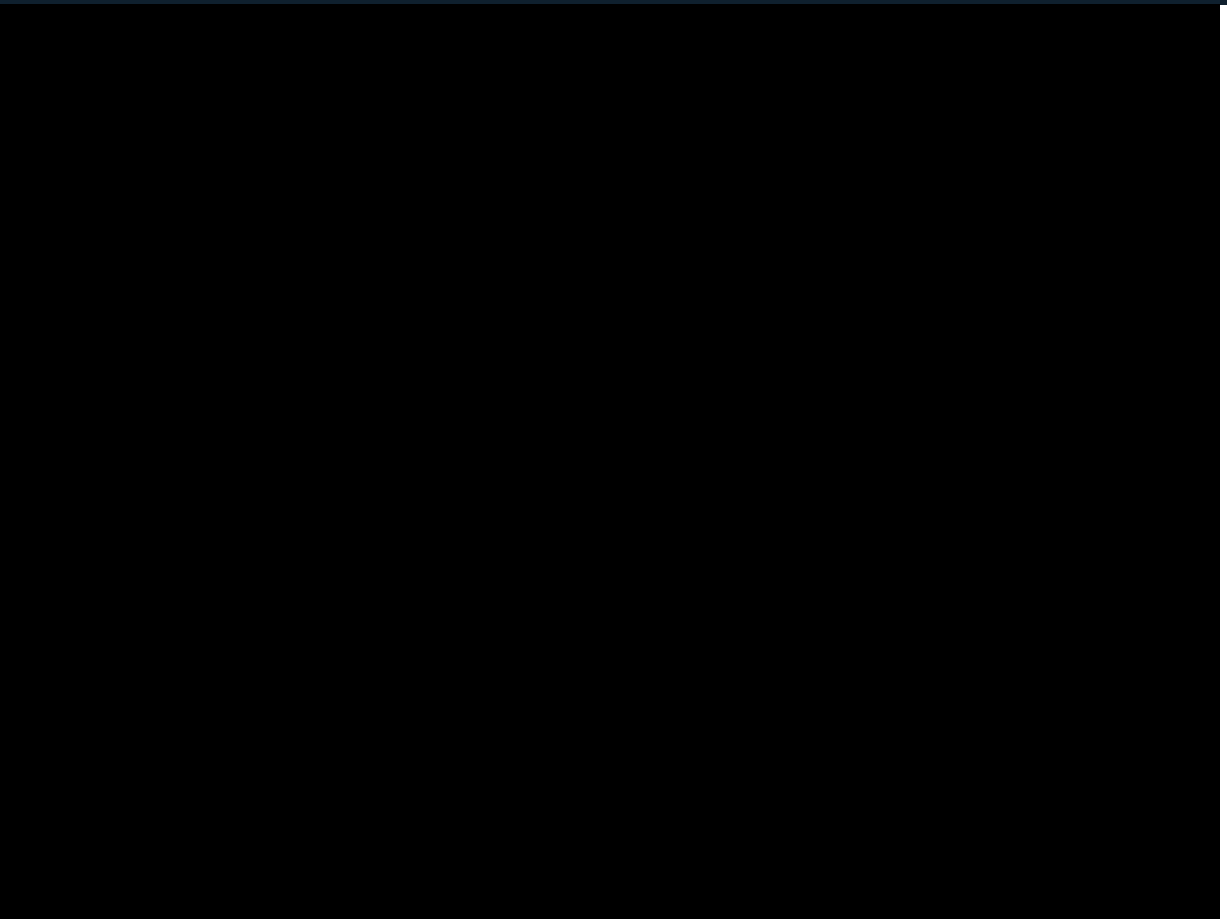
Access



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Pharoah Ants

Appearance

- Workers 1.5–2mm long, yellow–brown with brown abdomen.
- Males 3mm long, black and winged.
- Queens 3.5–6mm long, dark red in colour with wings.
- Black eyes. 2 small segments at the pedicel.

Image ©2003 Bayer

Lifecycle

- Multi–queen colonies.
- Swarming can take place at any time of the year.
- Winged adults seldom fly so rarely seen. Wings are soon lost after mating.

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Colony structure

Polygynous colony structure

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Brood coverage

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Experimental colony sizes

Colony sizes can range between 100,000+ workers with 300+ reproductives; to 100 workers with 1 or two reproductives

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Movement of Pharaoh ants

Worldwide spread of the pharaoh ant, Monomorium pharaonis (Hymenoptera: Formicidae)

James K. WETTERER
Myrmecological News 13 115-129 Vienna, April 2010

The pharaoh ant, Monomorium pharaonis (LINNAEUS, 1758), has long been considered the most ubiquitous household ant in the world. More than a century ago, VIEHMEYER (1906) wrote of M. pharaonis: "Coming from the East Indies, this ant has conquered almost the entire Earth. It has spread through commerce into almost all larger cities." SMITH (1979) concluded that in North America, M. pha-raonis is "probably found in every town or city of com-mercial importance especially in hotels, large apartment buildings, groceries, or other places where food is commer-cially handled." In addition to its ubiquity, SMITH (1979) asserted that *M. pharaonis* **"is the most persistent and difficult of all our house-infesting ants to control or eradicate."**

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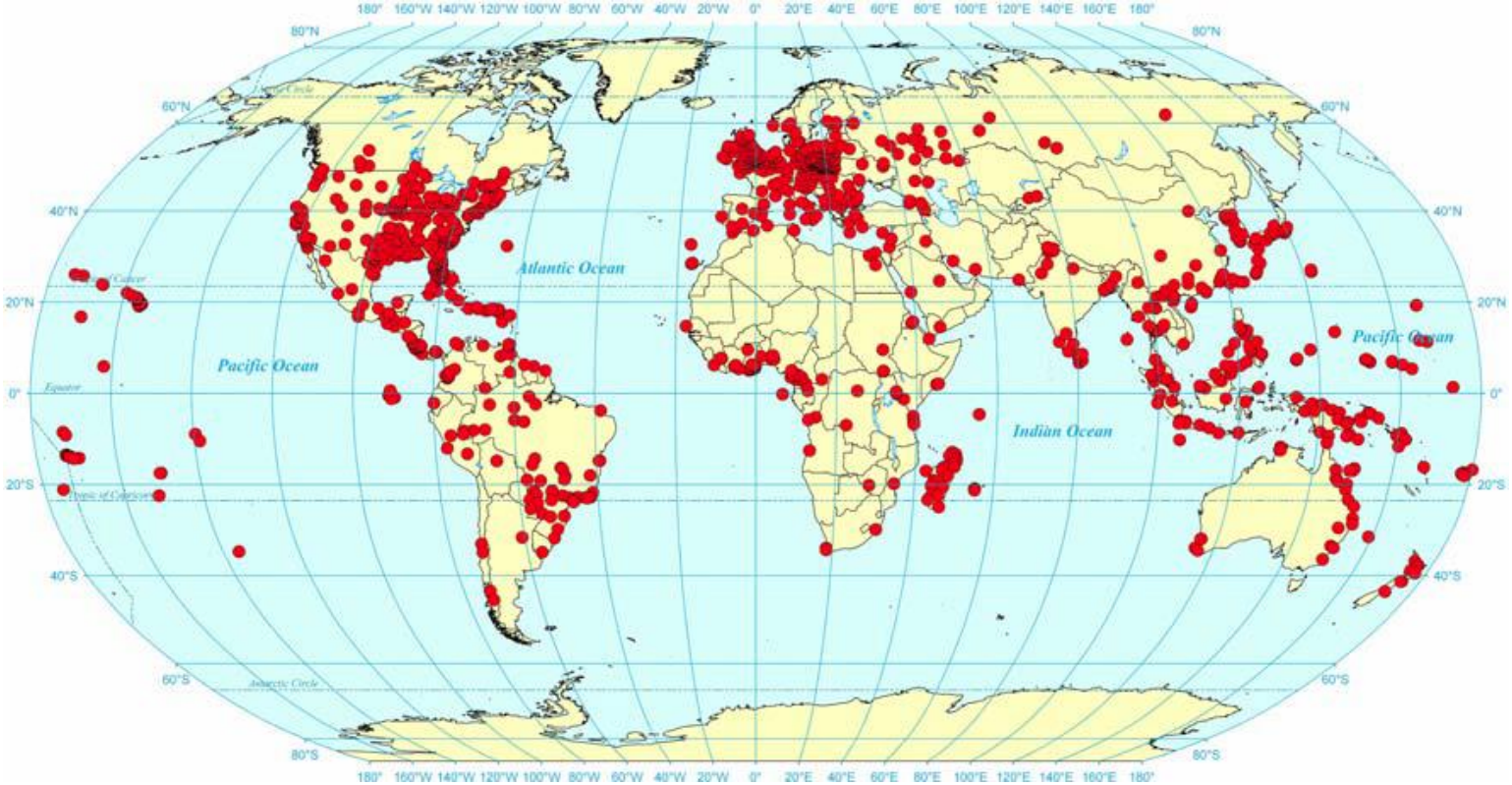
Recorded distribution of Pharaoh Ants



Earliest Norwegian record from ≤ 1975 (MEHL 1978)

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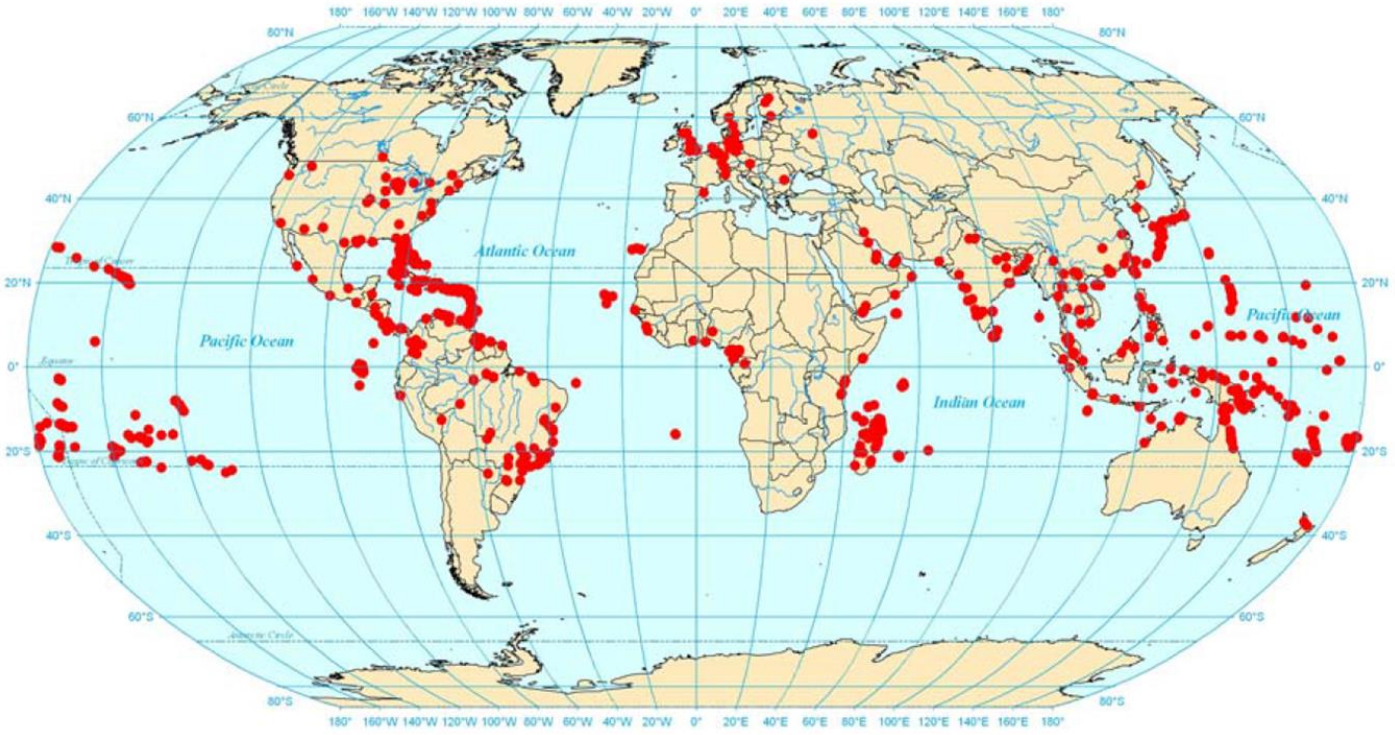
Recorded distribution of Ghost Ants



Earliest Norwegian record from ≤ 2006 (Birkemoe, 2006)

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Pest risk

PHARAOH'S ANTS AS PATHOGEN VECTORS IN HOSPITALS

The Lancet Volume 299, Issue 7747, 19 February 1972, Pages 425-427

Susan H.Beatson

Long-standing infestations of Pharaoh's ants (*Monomorium pharaonis* L) in nine hospitals were sampled to determine whether these ants carry organisms of medical interest, in particular *Salmonella* spp., *Pseudomonas æruginosa*, *Staphylococcus* spp., *Streptococcus* spp., and *Clostridium*spp. Examples of all these bacteria were isolated.

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How bad is it?

"patients who develop suppurating lesions are likely to suffer attack by ants that apparently feed on the discharge inside dressings. Workers are able to locate such patients very quickly and also those with a fever or profuse sweating. In intensive-care units the problem can be acute if the ants establish nests in the structure, since workers get into drip-tubes and resuscitation equipment. In baby-units worker ants have bitten the infants around the eyelids. In central sterile supply department stores foraging workers regularly get inside sterile packs."

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Habits

Habits

- Well–defined trails are laid which are often associated with heating systems. Feeds indoors on high protein foods — meat, fats, blood, dead insects, etc.
- Nest locations — deep seated in cavities in heated buildings. Often found in hospitals. Associated with humid conditions.
- Swarming characteristics — new colonies are often formed through nests that have been disturbed e.g., as a result of insecticide spray treatments. Each queen produces up to 3500 eggs in its lifetime.

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Types of disturbances

Range of biotic and abiotic factors*

- Physical – removing colony members, placing colony in new area or removing shelter
- Chemical – insecticide spray
- Invasion – by another species (e.g. *Tapinoma melanocephalum*)
- Dietary change – New source or lack of food/moisture

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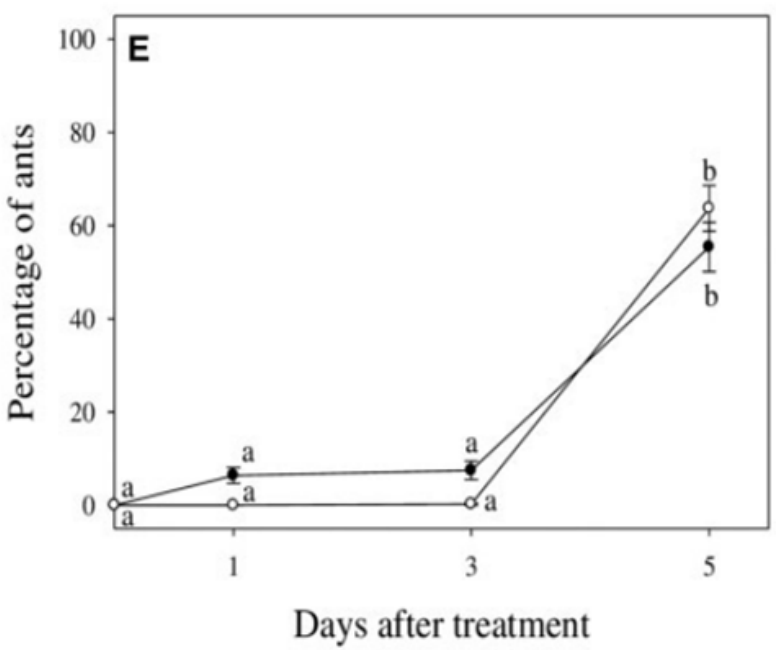
*Buczkowski *et al.,* 2005, Buczkowski & Bennet 2009, and Tay & Lee 2015

Food depletion to trigger colony budding



- Tay & Lee tried to induce budding by food depletion.
- All food was removed from the source nest
- Food was placed in new nests
- Budding was seen with 50% of the colony budding into new nests after 5 days.

Tay and Lee 2015

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Initiating budding in the laboratory

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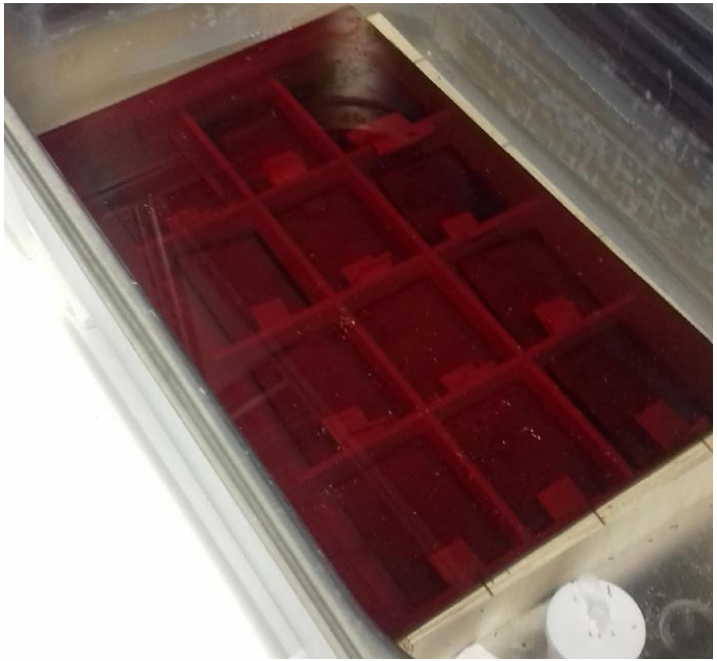
Previously at Rentokil…



- Colony had depleted food source to induce workers to forage for new food and bud into new nests.
- Source nest had a 50% reduction in food source.
- Budding not seen and new nests used for cemeteries

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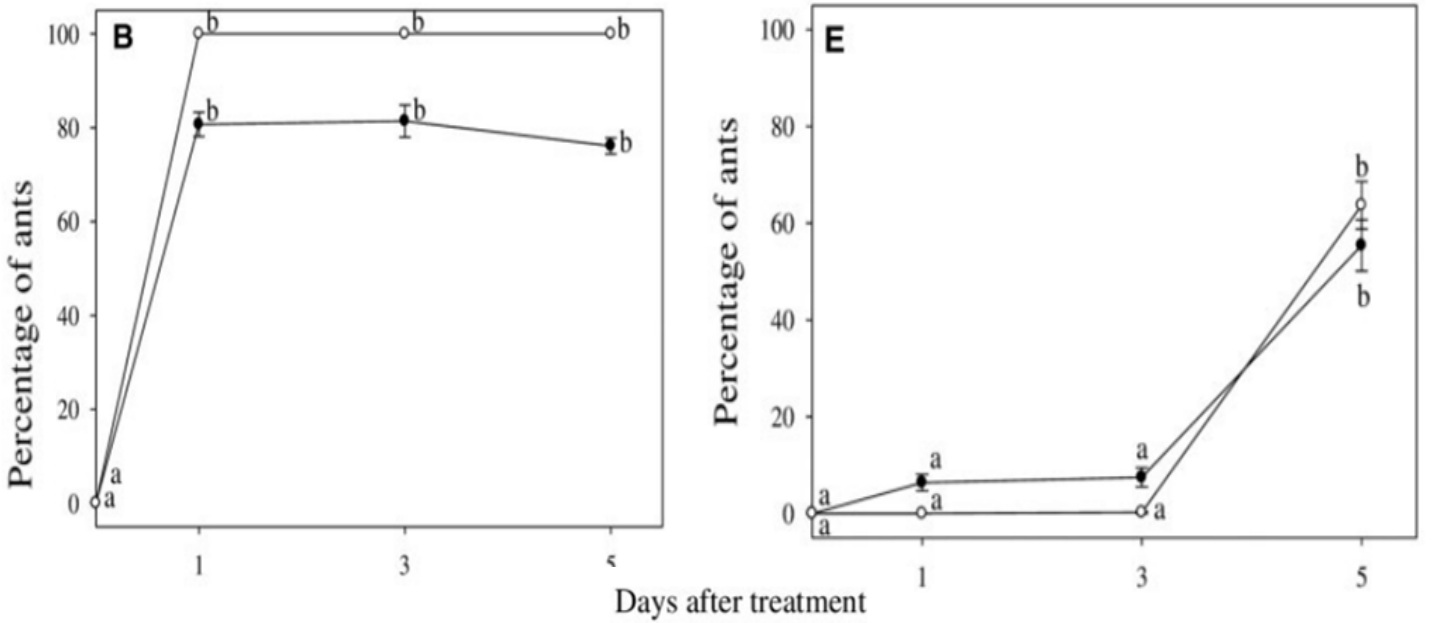
Physical disturbance to trigger colony budding

- Use a physical disturbance to cause budding as successful by Tay & Lee (2015) and Buczkowski & Bennet (2009).
- Budding occurred quicker with physical disturbance vs food depletion (movement of ants out of colony)



B – Physical disturbance

E- food depletion

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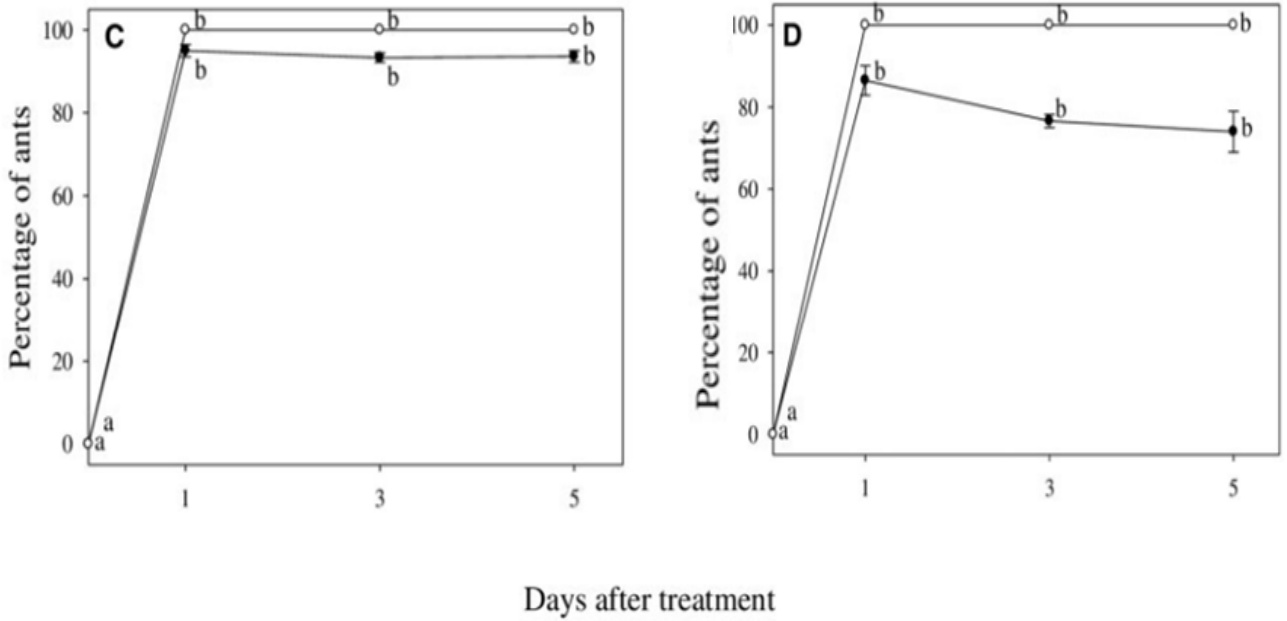
Chemical disturbance and ghost ant invasion

- Major disturbance may be needed to cause budding (shelter removed + new location)
- Other disturbances (chemical and invasive) are unfavourable due to their complexity



C – Chemical disturbance

D – Invasion of ghost ants

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Pharaoh Ant Control

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Bioassay testing

- Number of feeding instances
- Number of queens
- Percentage brood cover

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Bait bioassay

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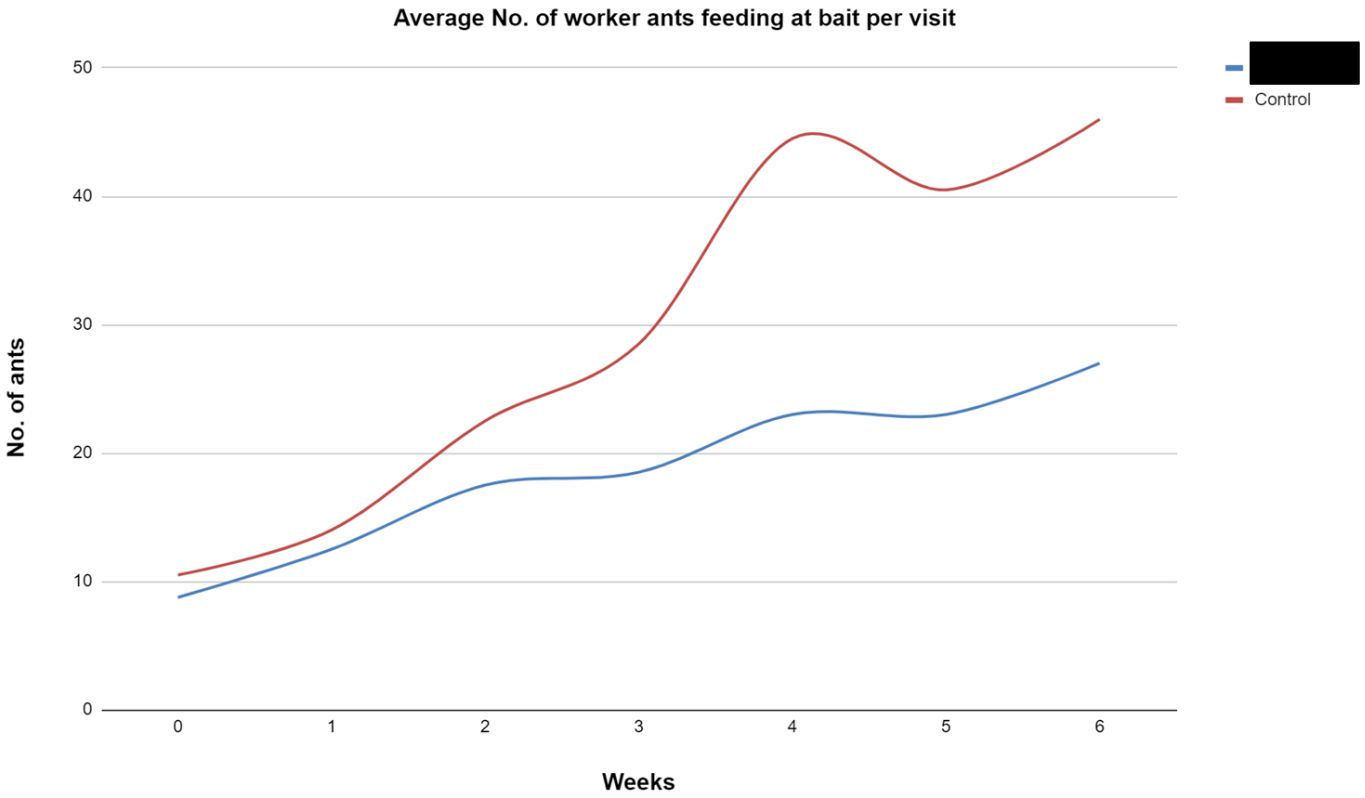
Measuring bait effectiveness: Feeding



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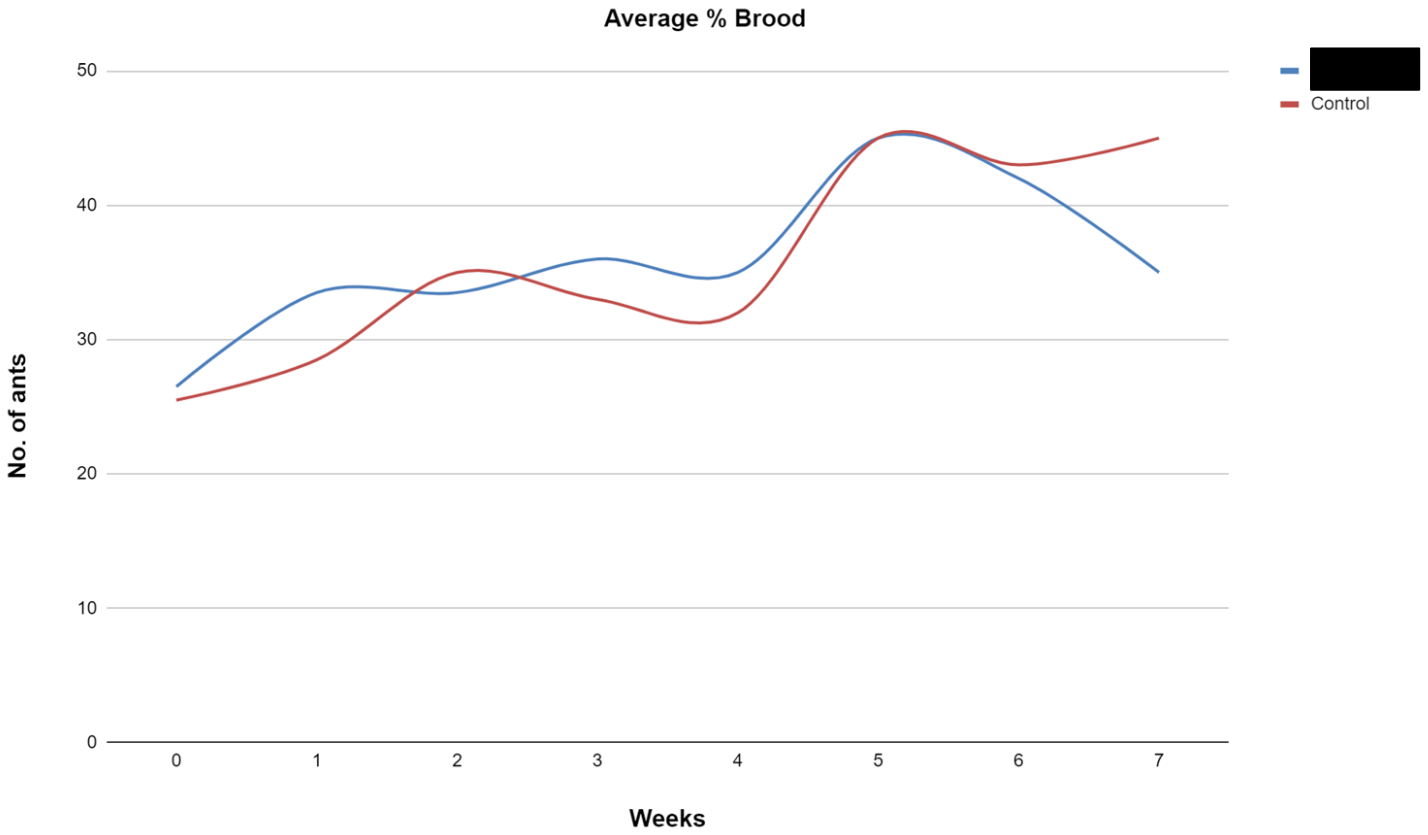
Measuring bait effectiveness: Brood



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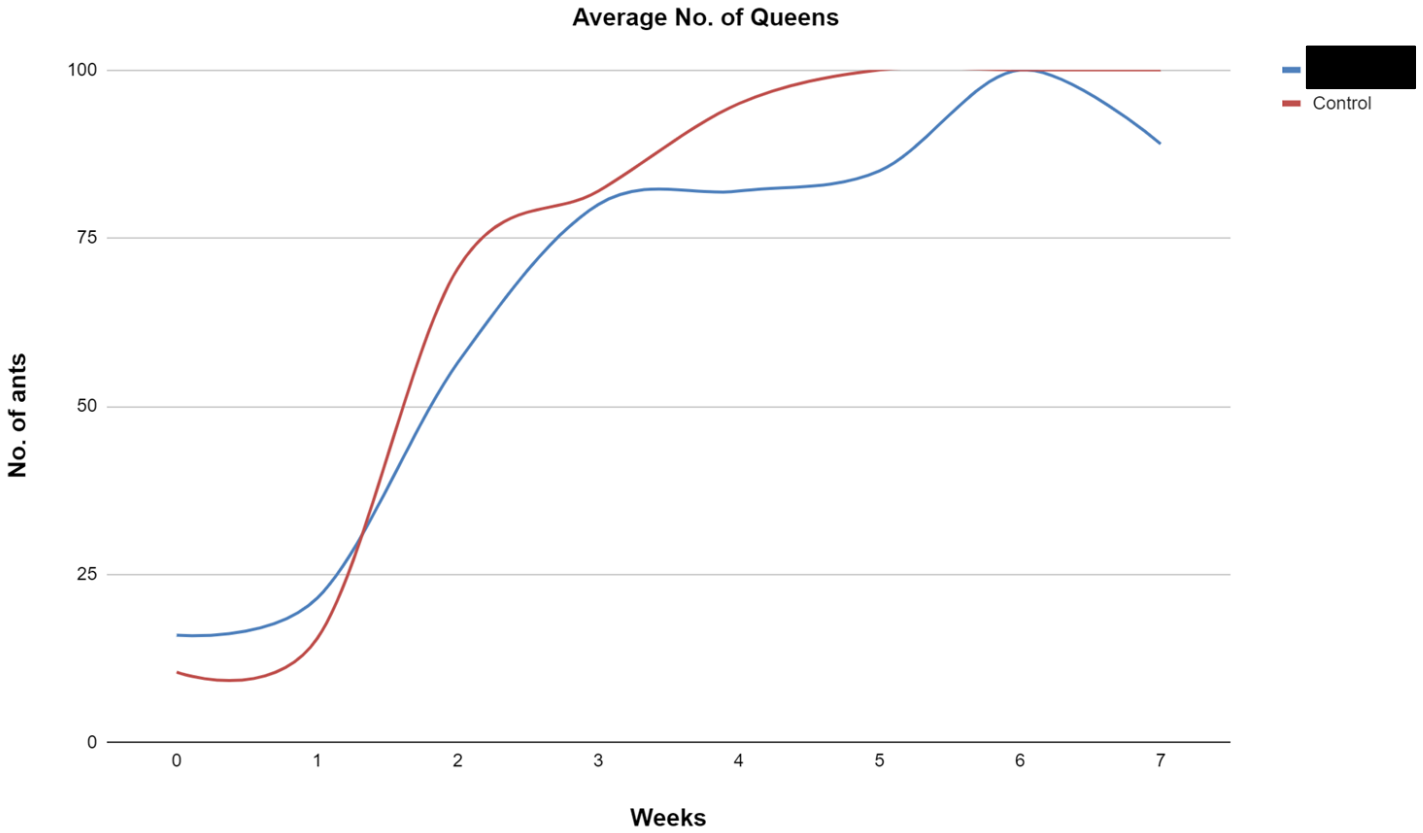
Measuring bait effectiveness: Queens



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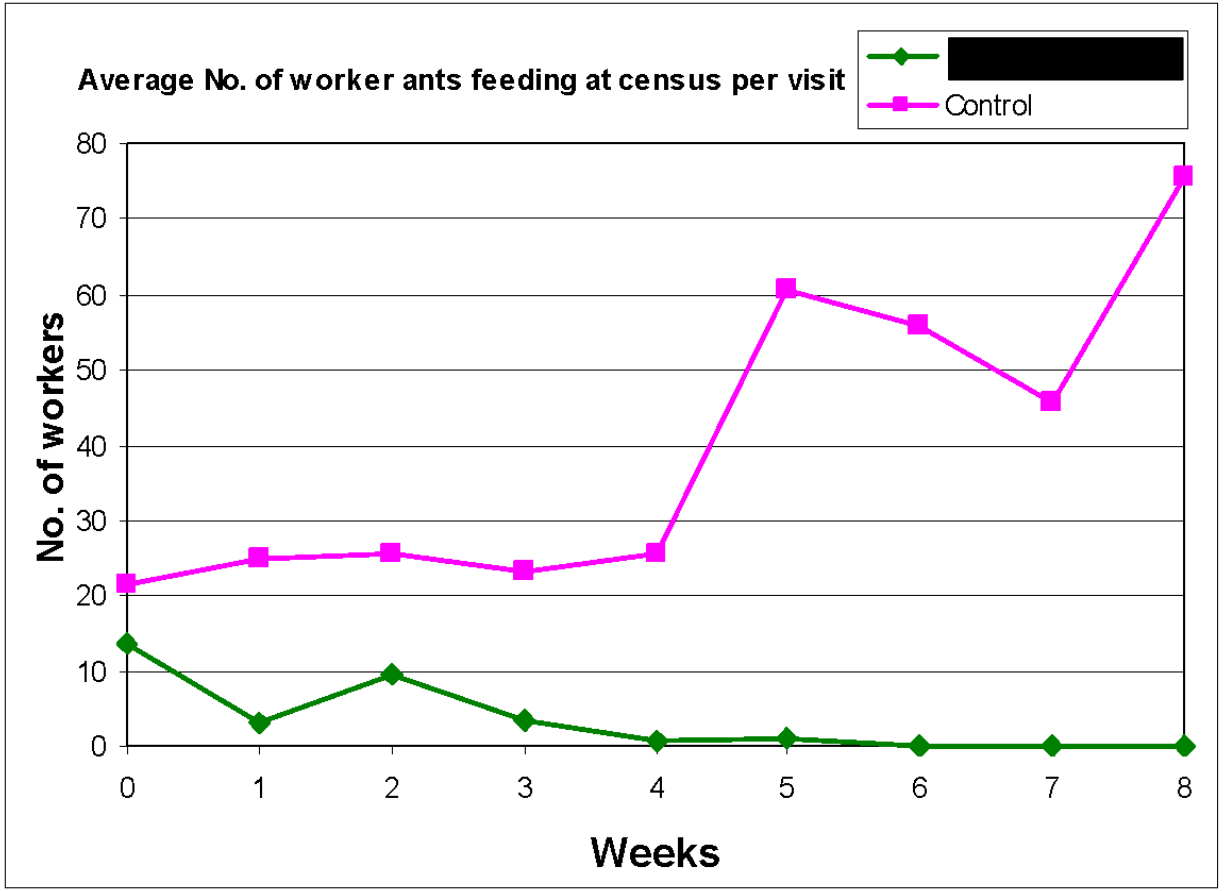
Measuring bait effectiveness: Feeding



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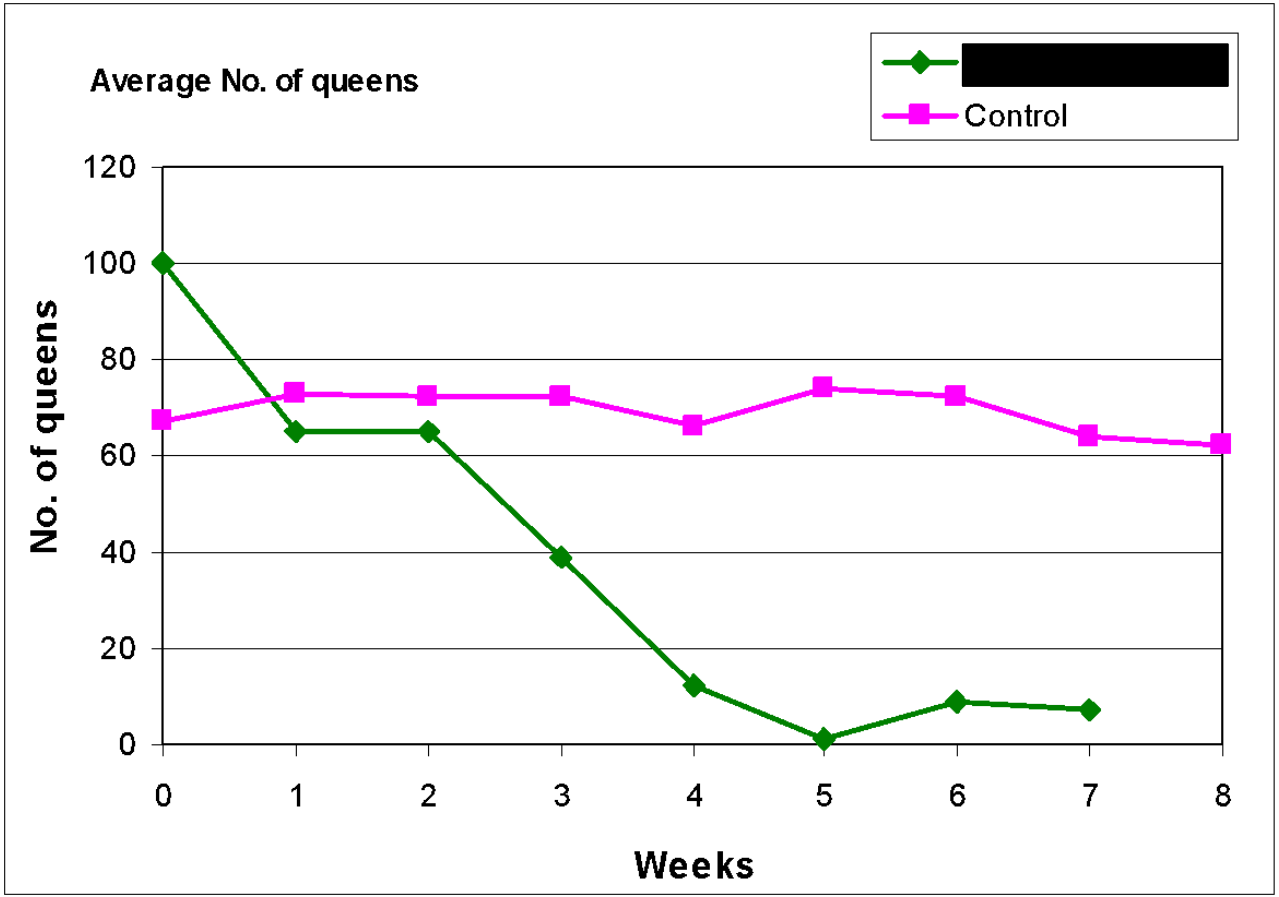
Measuring bait effectiveness: Queens



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What features make a good bait?

- Slow acting
- Palettable
- Lateral transfer

IGRs are an example of this, but IGRs are not the only baits that work well

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Sammendrag

- **Veldig små maur, veldig store kolonier**
- Faraomurene har mange dronninger og kolonier kan og vil dele seg hvis de blir forstyrret av fysisk eller kjemisk aktivitet
- Spraybehandlinger bør aldri brukes for faraomaur
- En produktetikett som sier "faraomur" er mer nyttig enn en som sier "maur"

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