Rodent Biology and Behavior Relative To Management Programs

Biology and Control of Insects and Rodents Workshop
2007 NEHA AEC Exhibition

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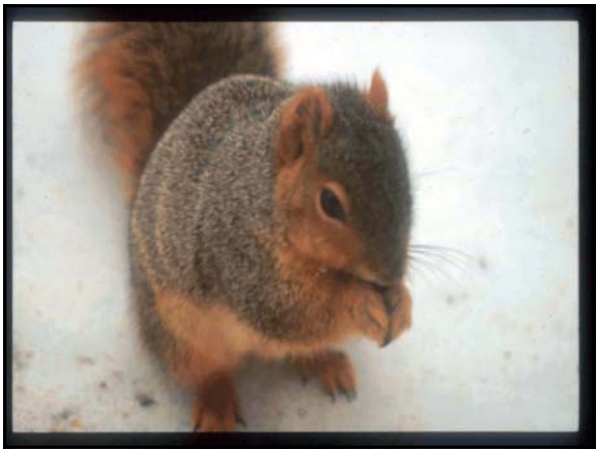

Part I

The biology and behavior of commensal rodents:

Adaptations to urban and

structural environments

1. Mus musculus, H. mouse (2nd most successful mammal).
2. Rattus norvegicus (Brown rat)
3. Rattus rattus

(Black rat)

Of Metropolises & Ratopolises

Rats Gone Wild in NYC (March 2007) a significant milestone in urban pest management:

1. The Food Industry

2. The Pest Management Industry

3. City Boards of Health


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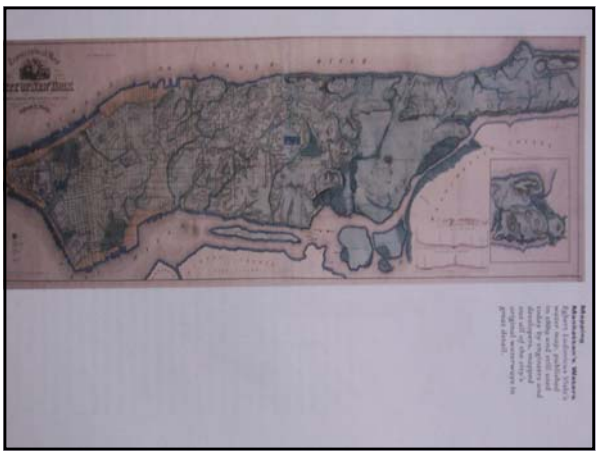
BROOKLYN
BRIDGE
278
EAST
BATTERY
PARK
HELIPORT



Research Updates

1. Vibrissal utilization

2. Cognitive Thinking

The deeper we look,
The more we learn.
A classic case of interspecific underestimations?

Rats isolate their whiskers to feel their way
14 February 2007

New high-speed video footage has revealed the extraordinary dexterity with which rats use their whiskers. The rodents are able to move these groupings of feelers independently on each side of their heads, allowing them to navigate efficiently in the dark.

When the whiskers on one side of the rodents' face hit a surface, they slow down by one-third. Meanwhile, those whiskers on the other side begin rapidly sweeping back and forth, even more broadly, in search of another contact point.
Journal reference: *Proceedings of the Royal Society B* (DOI: 10.1098/rspb.2007.0347)

A highly complex, adaptable, opportunistic, kleptoparasitic mammal.

The Average Brown Rat:

- Lives for about 5-6 months/wild
- Home range 50-100 ft (dis: 4 miles)
- 8-12 Pups per litter
- 5-6 Litters a year
- Sexual maturity: 8-12 weeks

The Average House Mouse:

- Lives for about 5-6 months/wild
- Est. Home range 10-30 ft. (d. < 2000ft.)
- 5-7 pups per litter
- 8-10 litters a year
- *Sexual maturity: 5-8 weeks*

High reproductive potential

A Family Unit of Mice/Rats

One male, several females, and the recent young; even more than one litter (10-20 ind).
* In the family unit, no aggression, but strange animals will be attacked even by the young of the family.

Opportunists

Rats and mice usually sample those foods they repeatedly encounter within their daily foraging areas.

In general, the grains, meats, chicken and sweets are well accepted.

Research has not demonstrated any clear food *item* preferance, although local rodent

communities may develop food dialects.

The foods of the city rat

1. Putrescible trash
2. Natural foods (birds, fish, insects, worms, etc.)
3. Pedestrian discarded food litter
4. Parks and pigeons
5. Alleys and cat food
6. Sewers 7. Storm Drains
8. Dog feces 9. Cannibals

Part II: Inspections

Pro-active inspections into *Rodent Vulnerable Areas* are the cornerstone to effective Integrated Rodent Management Programs.

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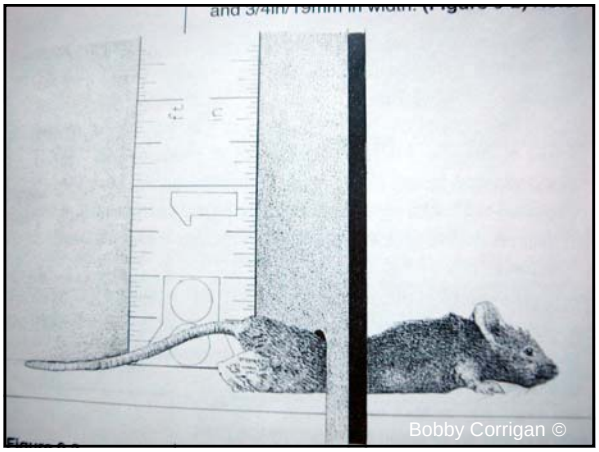

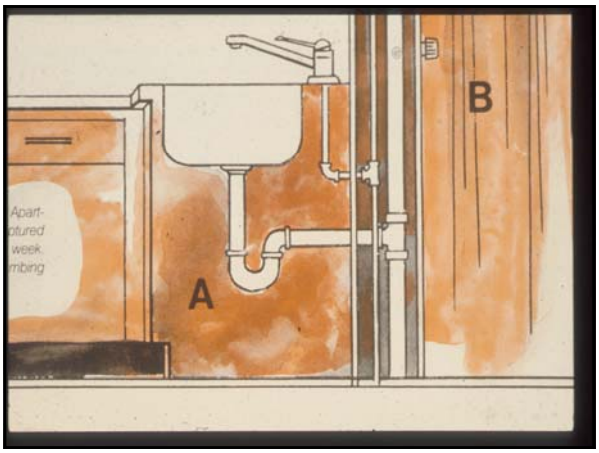

The "GPS" of Effective Urban Rodent Control?

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The Rodent Vulnerable Areas (RVAs) of Urban Structures

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Mice: Warmth + food

Rats: Food + harborage +warmth

Pest management professionals must train themselves to see what others overlook.

The Restaurant Scan
The Cityscape Scan

Warm Walls with Penetrations

Compressor motor voids of everyday kitchen equipment

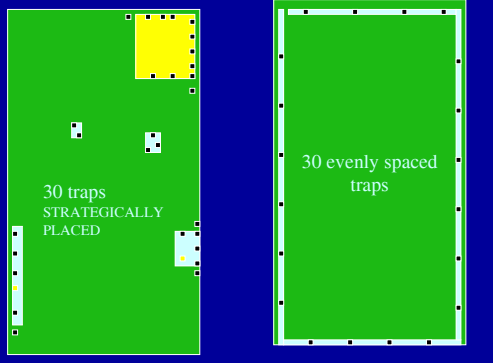
Warm uncapped concrete hollow block

Undisturbed boxes on top of cold boxes, freezers, etc.

RVAs : *Structural* Guide-Words for quickly locating rats and mice
In and around buildings:
Shadowy corners
Ledges **(e.g., sill plates)**
Lines (heating, electrical conduits).
Door thresholds
Fascia boards
Voids (furniture, equipment, ceiling, etc.)
Thick vegetative cover
Cavernous shrubs (Taxus)

Key *Conditional* Words for finding rats and mice in and around buildings:

*Warmth
* Near food
* Stationary items
* Let any droppings be your roadmaps.. To baits and traps place



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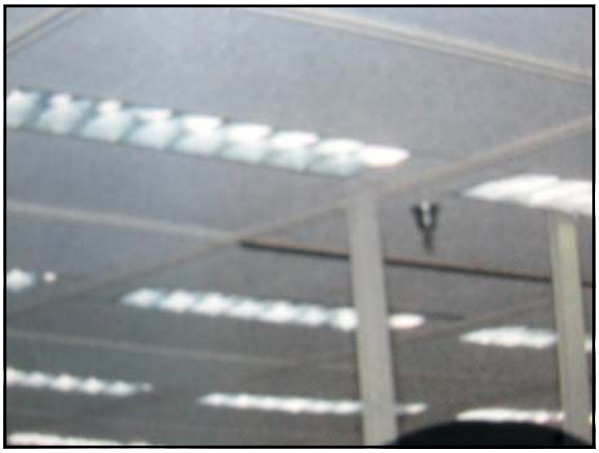
Rodent droppings are the road maps to rodent high activity areas
(I.e. Locations for traps and bait placements).


Reese.
SMALL PEARL
TAPIOCA
OPEN OTHER SIDE
Del Monte
Carb
Peach Chunks




STANFORD
HOTEL

Feces are commonly deposited in visible / accessible areas;
But rodents also commonly deposited their feces in Out-of-sight areas.
Pest and health professionals *should* always inspect OOS areas.

Pheromones define high activity areas
Rodent feces can serve as the roadmaps for placements of traps and/or baits.

In many cities, the presence of rodent feces are considered by health and food safety inspectors
As " smoking guns"
As to the premises having a rodent problem.

Part III
Tools and Techniques for IRM programs.

Mouse Traps

1. Snap traps superior to glue traps
2. Several bait choices into each territory; many traps 75-100 for infestations.
3. Pre-conditioning periods (unset traps) will facilitate complete control weeks later.

Rat Traps

1. Several bait choices into each territory.
2. Pre-conditioning periods (unset traps) will facilitate complete control weeks later.
3. Sandwhich technique for elusive rats.

Our jobs as best as we can do them are to manage (eliminate?) local *populations;*
Not "harvest down" to simply reduce the complaints

Integrated Rodent Management Programs

1. **Inspection and analysis**
2. Exlusion (not weatherstripping)
3. Sanitation is rodent control
4. Non-chemical
5. Chemical (rodenticide baits).
6. Emerging trends: (1) Green Programs and (2), Non-Lethal.

Pest control is a science
And a complex one at that.

We must expect evolutions and changes --
But the rate has definitely accelerated….

Rodent Baits: Formulation can dictate application hazards

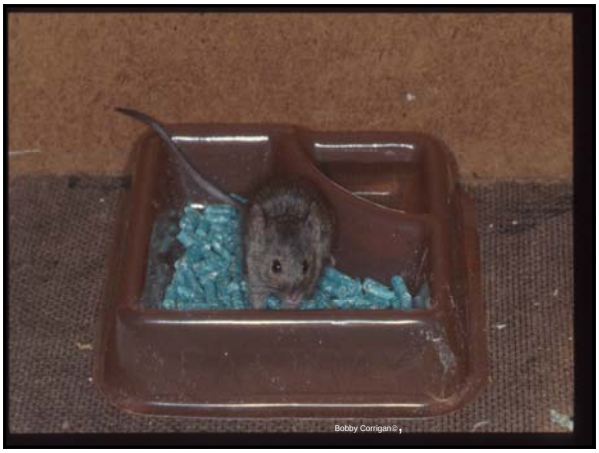
Secured bait blocks inside bait stations for most *structural* rat and mouse programs.

Unsecured blocks, pellets, packets and tracking powders:
High translocation threats into areas in which people (I.e., children) and pets can contact.

Rodents and Food:

Squirrels and found acorns is the kindergarden lesson.

Some pesticide formulations in certain uses are *inherently* hazardous to non-targets and the urban environment




meijer

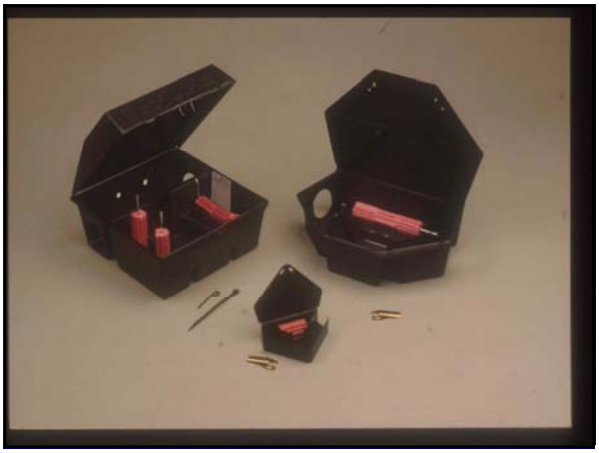
Pesticide

(e.g., Rodenticides)

formulations and applications that are IPM-compatible

Baits inside homes and the majority of commercial urban structures can be quite safely used: but its about the formulation choice and an *exact* placement via professional inspections

Blocks only: placed in tamper-resistant stations: placed only in out of reach/sight areas

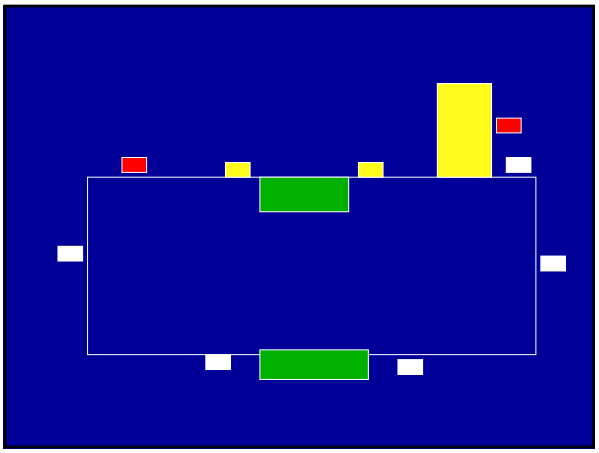


Significant changes *are* on the horizon for exterior commercial baiting programs.

1. Environmental concerns by EPA
2. PMP stewardship for environment
3. Client driven

EPA and other Important Organizations are currently evaluating the exterior use of 2nd generation anticoagulants
For potential impact to non-target mammals and birds

Presence, Spacings, and Type of Exterior RM Stations Are Undergoing Challenge and Study



There ***are*** important environmental questions needing to be evaluated.

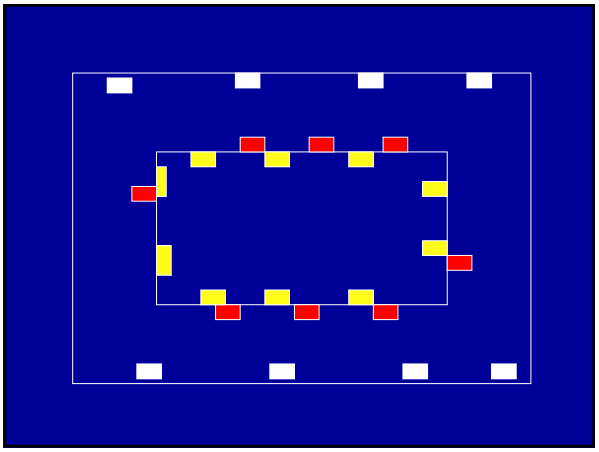
Exterior wall RM stations are necessary. But distanced fence-line stations may or may not provide any additional protection; depending on situation and distance.

Potential impact of rodenticide baiting programs along fence lines nearby vegetation.

1. Non target small mammals
2. Predators (birds and mammals) of those small mammal populations

Small and invisible does not mean insignificant…….

a small "rodent" is not of any less ecological importance than the large, visible, and more " glamorous" wildlife species.



Should property line rodent management programs be standard?

Yes.

Should property line *poison baiting* programs be *standard ?*

No.

Alternative Options

1. Snap Trap Stations
2. Detex Stations

In coordination with building side data.


Protecta Sidewinder
Protecta RTU
Protecta Keyless
Protecta LANDSCAPE


DO NOT TOUCH
POISON