Rodenticides

Regulations, Risk, and IPM

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Rodents and Rodenticides
Today’s talk will cover:

• Rodent issues in and around buildings
• Preventative practices for all rodents
• Tips for common species in Oregon

• Available active ingredients for rodent bait
• Risk to wildlife, including children
• New regulations that limit access
• What about rodents infesting vehicles?
Across the board

- Rodents need food, shelter, and water
- There is no silver bullet for all rodent species
Don’t create ideal shelter for rodents
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Don’t allow entry points into buildings
Don’t allow entry points into buildings
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Remove sheltered food & water
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Challenging Scenarios
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Identify your pest

• Unlike rats, mice may not need water if they have food.
• Mice typically stay within 35 feet of their nests.
• Rats travel hundreds of feet and memorize their surroundings.
• Norway rats nest in or near the ground. Roof rats nest in elevated locations, including trees.
• Only deer mice can be carriers of Hanta virus.
• Rats and mice can swim, but only rats will dive.
• Rats are wary of new things, mice are more curious.
NORWAY RAT
Average length ¾ inch

ROOF RAT
Average length ½ inch

HOUSE MOUSE
Average length ¼ inch
Who has been digging holes?

Rats, Norway:

Holes tend to be 2-3 inches wide and smooth from repeated use. Rats are secretive and rarely seen during the day. If you see them during daylight hours, it means you have a lot of rats on the premises. Drawing of their burrow system can be seen below. Photo at right shows a Norwary rat hole. Note the 6" ruler above.
Who might have been digging holes?

- Dime-sized, near roots - Voles
- Silver-dollar size – Chipmunk
- 2 inches, near water – Crayfish
- 2-3 inches – Norway rat
- 3 inches – Ground Squirrel

There will be another hole within 20 feet. Look for grooves in the grass.
Who might have been digging holes?

- **Badgers** > 6 inches, lots of excavated dirt outside the hole
- **Mountain beaver** 6-8 inches
- **Prairie dog** – found in colonies, mounded holes
- **Skunks** – Often under sheds or porches, doesn’t always stink
- **Woodchucks** – average 8 inches, prefer dry soil, dirt porch

Foxes will take over dens dug by others, like skunks or woodchucks. Crafty little....
The IPM Checklist

• Identify your pest, get to know your enemy
• Find entry points, nests, estimate the population size
• Change the habitat, remove any “welcome mats”
• Batten down the hatches, seal up any points of entry
Traps

• Consider your pest. Brave or timid? If timid...
  • Consider placing sprung snap traps (harmless) for several days...
    • Then add food-baits (try a variety)
      • Then set the traps, all on one night, with food that is preferred

Estimated rodent population = number of traps
Traps – glue boards

• They scream, gnaw their own legs off, escape
• Pets & kids are vulnerable
• For insects & spiders, a better option
Traps
Ultrasonic Devices

Don’t waste your money.
Rodenticides

- Designed to attract animals
- Flavorings include fish oil, molasses, peanut butter, etc.
- Pets would be just as interested as rodents
The Dose Makes the Poison
Rodenticide Types

Multiple dose anticoagulants (1\textsuperscript{st} generation)
  • Warfarin, chlorphacinone, diphenacinone

Single dose anticoagulants (2\textsuperscript{nd} generation)
  • Bromadiolone, difethialone, brodifacoum

Miscellaneous non-anticoagulants
  • Bromethalin, cholecalciferol (vitamin D3), zinc phosphide, strychnine
Multiple Dose (1st gen) Anticoagulants

- warfarin, chlorphacinone, diphacinone

- Multiple nights of feeding required
- Prevent production of blood clotting agents
- Clotting agents have to run out, can take up to 5 days
- Signs include weakness, bleeding, lethargy
Single Dose ($2^{nd}$ gen) Anticoagulants

- Bromadiolone, difethialone, brodifacoum
- Only a single night of feeding required
- Prevent production of blood clotting agents
- Clotting agents have to run out, can take up to 5 days
- Signs include weakness, bleeding, lethargy
5-7 days with lethargy, weakness...
Rodenticides & Wildlife

- Poisoned rodents may continue eating bait for days, building up large amounts in their bodies.
- Residues can remain in liver tissues for many weeks, if the animal survives that long.

- Survey of 58 fisher carcasses
  - 79% had anticoagulant inside
    - 96% of those had >1
  - Four probably died from anticoagulant poisoning
**Other Rodenticides – Wildlife Risk?**

**Bromethalin**
- Low risk for birds, mammals
- Signs begin sooner, hind legs stop functioning

**Zinc phosphide**
- Low risk for birds, slight risk for mammals
- ZP breaks down quickly, rodents must be very recently dead, pellets must be intact to harm predators

**Strychnine & Cholecalciferol (vitamin D3)**
- May pose risks, not well-studied
Rodenticide Types

Multiple dose anticoagulants (1\textsuperscript{st} generation)
  - Warfarin, chlorphacinone, diphacinone

Single dose anticoagulants (2\textsuperscript{nd} generation)
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Miscellaneous non-anticoagulants
  - Bromethalin, cholecalciferol (vitamin D3), zinc phosphide, strychnine
Risks to Children & Wildlife

• Poison Control Centers were receiving 12,000 – 15,000 calls per year about rodenticide exposures in children under 6
  - Average 115 cases per year had symptoms
  - Average 17 cases per year went to ICU

• Spot surveys found 2nd gen anticoagulants in wildlife carcasses:
  • 48% of raptors and owls (248 analyzed)
  • 80% of bobcats, mountain lions and kit foxes (106 analyzed)
Why not make them RUPs?

Poultry and livestock producer groups spoke up: “It would be a significant burden to get our people certified.”
2nd generation anticoagulants

Registrants must control distribution:
- Only allowed in agricultural, farm, and tractor stores
- ... or directly to commercial applicators
- Not allowed in regular hardware stores, home improvement stores, grocery stores, etc.

For all outdoor, above-ground placements:
- Tamper-resistant bait stations required wherever kids, pets, or non-target wildlife may be.

Bromadiolone, difethialone, brodifacoum = 2nd gen
New Rodenticide Regulations

To reduce exposure to children, products marketed to general and residential consumers:
• No more loose pellets
• Baits sold only with bait stations

To reduce wildlife impacts:
• Residential products will not contain single dose (2nd gen) anticoagulants
• Bait stations required for all outdoor, above-ground uses of single dose (2nd gen) anticoagulants

Bromadiolone, difethialone, brodifacoum = 2nd gen
Products marketed to residential consumers

- No more than one pound of bait can be sold in each unit.
- Refills cannot be sold without bait stations.
- No more meal, treated whole-grain, pelleted, and liquid forms of bait.
- If products are only labeled for outdoor, below-ground use, no bait station is required.
Products marketed to professionals

Agricultural professionals:
• *Minimum* package size = 8 pounds
• That’s for products labeled only for use in and around agricultural buildings (within 150 feet), not for use around residences

Commercial applicators:
• *Minimum* package size = 16 pounds
Too hot, too cold, or just right?

D-Con producer balked and sued EPA, saying the new rules were unreasonable. They continued selling pellets for residential use from 2011-2014.

California balked, saying the new rules didn’t go far enough. They designated all of the 2nd generation anticoagulants as RUPs.
What about rodents infesting vehicles?

- Eliminate food inside/nearby
- Drive it regularly
- Park in different places
- Noise playing overnight
- Strobe lights overnight
- Balloons or pie plates tied to underside of vehicle
- A garden gnome with eyes directed under the car...
Conclusions

• It is definitely possible to manage rodents without rodenticides, but they can be important tools.

• Identify your pest. It makes a difference.

• Some products are more/less likely to harm wildlife. Choose wisely for your situation.

• New regulations keep tools available, but they make it HARD for residential users to buy the most toxic rodenticides.
Conclusions

I want this gnome next Christmas.

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