Rodenticides and Secondary Poisoning
What is a rodenticide?

• Pesticides that target rodents
• May be grain or seed based, extruded, liquids, or in dust form
What is Secondary Poisoning?
Why should we be concerned about secondary poisoning?

- Stewardship
- Responsibility
- Law suits
Looking at some active ingredients
Types of Rodenticides

Rodenticides can be classified into 2 broad categories:

- Anticoagulants
- Non-anticoagulants
Anticoagulants

- Cause death by interfering with vitamin k1, which is essential to the blood clotting process.
- Results in death by internal blood loss from damaged capillaries.

Anticoagulant rodenticides are classified into First-generation and Second-generation anticoagulants
First-Generation Anticoagulants

- Includes warfarin, chlorophacinone, diphacinone
- Considered **multiple dose** rodenticides

Examples of First-Generation Anticoagulant Rodenticides

- Liqua-Tox II
- Rozol Tracking Powder
- DiTrac Blocks
Second-Generation Anticoagulants

- Includes brodifacoum, bromadiolone, difethioline, difenacoum
- Kills rodents resistant to first-generation anticoagulants
- Considered *single dose* anticoagulants

Examples of Second Generation Anticoagulant Rodenticides

- Generation BlueMax Mini Block
- First Strike
- Resolve Soft Bait
- Maki Mini Blocks
Non-Anticoagulant Rodenticides

Includes:
- Bromethalin (Affects the nervous system)
- Cholecalciferol (Hypercalcemia) Ultimately leading to cardiac arrest
- Zinc Phosphide (Blocks the body’s cells from creating energy)
- Can be single or multiple dose poisons

Examples of Non-Anticoagulant Rodenticides

<table>
<thead>
<tr>
<th>Terad 3</th>
<th>Motomco Eraze AG</th>
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<tbody>
<tr>
<td>Fastrac</td>
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</tbody>
</table>

Block Baits

• Attractive gnawing surface
• Must be in tramper resistant bait stations
Pellet Baits

- Rodents can readily pick up and handle
- Susceptible to translocation
Loose Meal Baits

- Susceptible to absorbing moisture
- Less suitable in damp locations
- Less susceptible to translocation
Packet style or place Packs

- Contained in plastic or paper packets
- Packaging adds longevity to the bait
- Susceptible to translocation
Liquid Baits

• Must be placed in professional liquid containers to minimize spillage

• Susceptible to hot and cold environments
Tracking Powders

- Restricted Use
- Easily Transferable
- Picked up on body hair and paws then ingested during grooming.
<table>
<thead>
<tr>
<th>Rodenticide</th>
<th>Birds</th>
<th>Mammals</th>
<th>Time to death after lethal dose</th>
<th>Acute LD50 Rats</th>
<th>Antidote</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warfarin</td>
<td>Slight risk</td>
<td>Low risk</td>
<td>~ 3 days</td>
<td>58 mg/kg</td>
<td>Vitamin K</td>
</tr>
<tr>
<td>Chlorophacinone</td>
<td>Slight risk</td>
<td>Highest risk</td>
<td>8 – 12 Hours</td>
<td>50 mg/kg</td>
<td>Vitamin K</td>
</tr>
<tr>
<td>Diphacinone</td>
<td>Moderate risk</td>
<td>Highest risk</td>
<td>4 – 6 days</td>
<td>3.0 mg/kg</td>
<td>Vitamin K</td>
</tr>
<tr>
<td>Bromadiolone</td>
<td>Moderate risk</td>
<td>Moderate risk</td>
<td>3 – 4 days</td>
<td>1.13 mg/kg</td>
<td>Vitamin K</td>
</tr>
<tr>
<td>Difethiolone</td>
<td>Highest risk</td>
<td>Moderate risk</td>
<td>4 – 6 days</td>
<td>7 mg/kg</td>
<td>Vitamin K</td>
</tr>
<tr>
<td>Brodifacoum</td>
<td>Highest risk</td>
<td>Highest risk</td>
<td>4 – 8 days</td>
<td>0.27 mg/kg</td>
<td>Vitamin K</td>
</tr>
<tr>
<td>Bromethalin</td>
<td>Low risk</td>
<td>Low risk</td>
<td>24 – 36 hours</td>
<td>2 mg/kg</td>
<td>None</td>
</tr>
<tr>
<td>Cholecalciferol</td>
<td>Low risk</td>
<td>Low risk</td>
<td>3 – 7 days</td>
<td>42 mg/kg</td>
<td>Various</td>
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<tr>
<td>Zinc Phosphide</td>
<td>Low risk</td>
<td>Slight risk</td>
<td>1 – 3 days</td>
<td>21 mg/kg</td>
<td>None specific</td>
</tr>
<tr>
<td>Strychnine</td>
<td>Possible</td>
<td>Possible</td>
<td>15 – 60 minutes</td>
<td>2.35 mg/kg</td>
<td>None</td>
</tr>
</tbody>
</table>
How can we reduce the risk of secondary poisoning?

• Exclusion
• Habitat & harborage reduction
• Trapping
• Use as little rodenticide as possible
• Pick up and dispose of dead rodents
Sources

- Npic.orst.edu
- Newzealandecology.org
- U.S. EPA
- California Department of Fish and Game
- Bio-Integral Resource Center
- PCT Magazine
- NPMA
- New York Department of Environmental Conservation
- Cornell University