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The Future of Vertebrate Pesticides

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Vertebrate Pest Damage

How can it be mitigated?

General Vertebrate Control Methods

- Environmental Modifications
- Exclusion
- Biological
- Repellants
- Rodenticides
- Trapping
- Shooting

Rodenticides

- Rodenticides are pesticides used in urban, suburban, and rural areas to control rodents.
- Used to prevent transmission of disease and property damage.
- Used to control rodents that damage crops.

Anticoagulants

- A group of rodenticides which have the same mode of action.
- Anticoagulants are widely used for commensal rodent control.
- Anticoagulants are also used for the control of field rodents.
- Anticoagulants can be separated into two distinct groups.

1st Generation Anticoagulants

Warfarin, Chlorophacinone & Diphacinone

- Warfarin, the first anticoagulant rodenticide, discovered in1943.
- Subsequently, other similar anticoagulants were developed.
- The first generation anticoagulants are chronic in their action.

2nd Generation Anticoagulants

- Genetically linked resistance in rats and mice to 1st generation anticoagulants.
- Concern over resistance stimulated research in Europe.
- Research led to the development and marketing of Brodifacoum, Bromadiolone, Difethialone, and Difenacoum.
- Much more toxic, rodents can consume a lethal dose in one feeding.

Acute Toxicants

- Acrolein, Aluminum Phosphide, Gas Cartridges,& Strychnine - Registered for controlling burrowing rodents (i.e. California ground squirrels and pocket gophers).
- - Zinc Phosphide - Used on grain baits and bait blocks to successfully control meadow voles, pocket gophers, ground squirrels, Norway rats, Polynesian rats, cotton rats, and nutria. Bait shyness with zinc phosphide use has been observed in some instances.

Dangers Associated with Rodenticides

- Children may have access to baits in domestic settings.
- Potential primary and secondary risks to birds and non-target mammals.

Reregistration

- Rodenticides first regulated in 1947 under the Federal Insecticide, Fungicide, Rodenticide Act (FIFRA).
- Reregistration was initiated for the Rodenticide Cluster for pesticides registered prior to 1984.

✓Warfarin	1948	✓Brodifacoum	1979
✓Diphacinone	1960	✓Bromadiolone	1980
✓Chlorophacinone	1971	✓Bromethalin	1984

Important RED Timeframes

- July 1998 Rodenticide Cluster Reregistration Eligibility Decision (RED) issued.
- October 1999 – September 2001 EPA drafted comparative risk assessment.
- September 2004 EPA issued revised ecological risk assessment based on comments received on the preliminary draft.
- January 2007 EPA issued Proposed risk mitigation decision and takes over 700 comments.
- Final risk mitigation decision issued May 28, 2008.

2007 Proposed Mitigation Major Changes

- Make 2nd generation anticoagulants, including brodifacoum, bromadiolone, and difethialone restricted use materials for use by certified applicators.
- Formulation and package restrictions for 1st generation anticoagulants (chlorophacinone, diphacinone, and warfarin) and non-anticoagulants (zinc phosphide, bromethalin, and cholecalciferol), available to homeowners.

2008 Final Mitigation

- 2nd generation anticoagulants (brodifacoum, bromadiolone, difenacoum, and difethialone) not restricted use materials. But packaging and sales restrictions put in place.
- 1st generation anticoagulants (chlorophacinone, diphacinone, and warfarin) and non-anticoagulants (zinc phosphide, bromethalin, and cholecalciferol) available to homeowners, with packaging restrictions.

2008 Final Mitigation Cont.

- "The risk mitigation decision described in this document does not apply to rodenticide field uses or to tracking powder products. Risks associated with field uses and tracking powders were addressed in the 1998 Zinc Phosphide and Rodenticide Cluster Reregistration Eligibility Decision (RED) documents."

1998 RED

- “All products labeled for field uses, except those limited to manual underground baiting, must be reclassified and relabeled as restricted use because of acute toxicity and high potential for primary and secondary risks to nontarget mammals and birds.”

- “EPA’s comparative ecological risk assessment evaluated multiple lines of evidence and concluded that the second-generation anticoagulants have greater potential to adversely affect non-target wildlife, especially birds, than the first-generation anticoagulants.”

- “EPA believes that misuse and overuse of rodenticides is more common among general consumers than occupational users. General consumers are less likely to accurately understand rodenticide risks, rodent behavior, the manner in which particular rodenticides work, and are less likely to read and follow label instructions correctly.”

Who Can Use Restricted Use Pesticides

- **40 CFR 171.7(b)(1)(iii)(D) FAC** 14015. Except as provided by regulation adopted by the director, a restricted material shall only be possessed or used by, or under the direct supervision of, a private applicator, who is certified pursuant to Section 14093, or a certified commercial applicator, as defined by Section 6000 of Title 3 of the California Code of Regulations.

Certification

- All field use rodenticides will become restricted use.
- Only certified applicators will have access to the restricted use products.
- Commercial production agricultural properties generally have staff that are certified.
- Concern is for the smaller “Ranchette” properties.

“Ranchette”

Small Agricultural Property

Production Agriculture

How Does a “Ranchette” Owner Use Restricted Use Products?

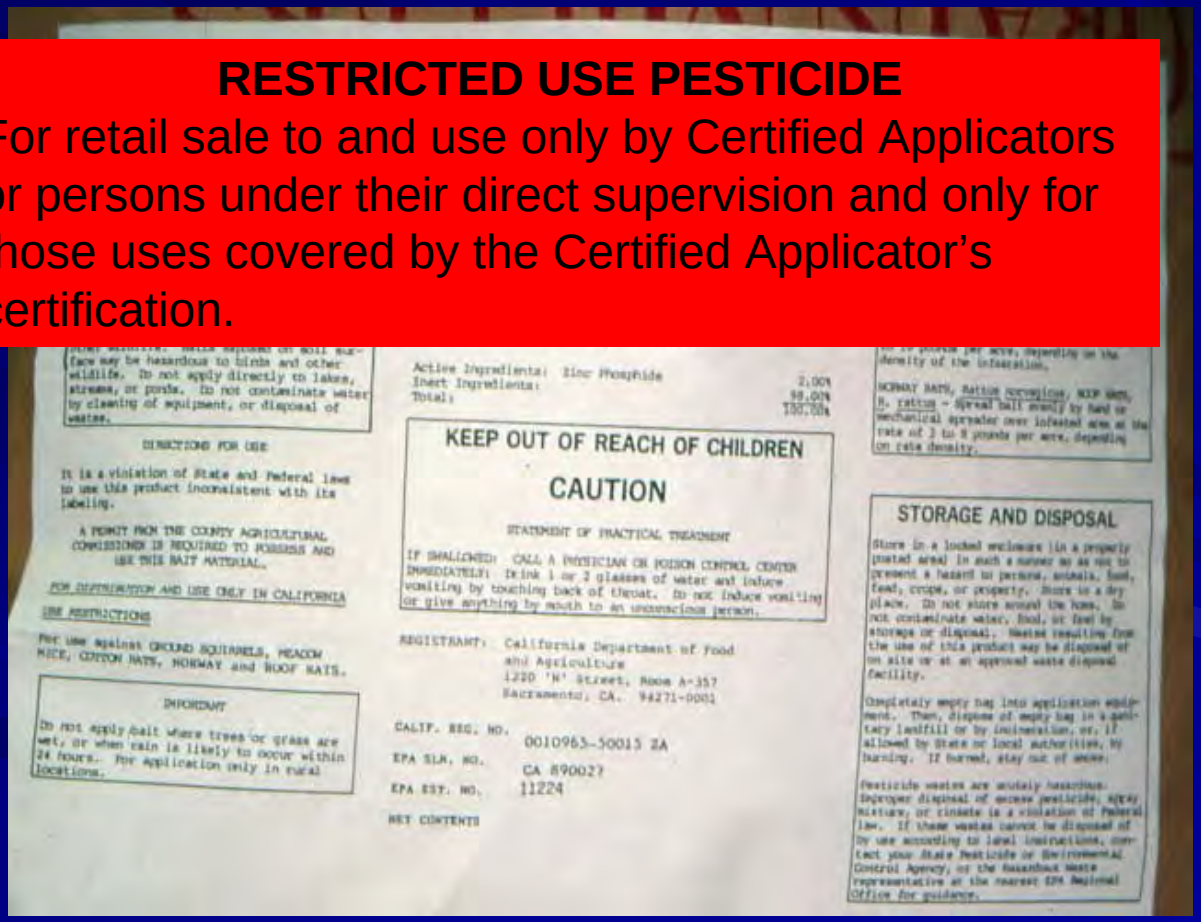
- Take the private applicator exam.
- Certified to use any restricted use material.
- Use per the label directions.

*The problem is that many of the “Ranchettes” do not use any other products that are, or may become restricted.

Example of Currently Registered Pesticide Label

RESTRICTED USE PESTICIDE

For retail sale to and use only by Certified Applicators or persons under their direct supervision and only for those uses covered by the Certified Applicator's certification.



DIRECTIONS FOR USE

It is a violation of State and Federal laws to use this product inconsistent with its labeling.

A PERMIT FROM THE COUNTY AGRICULTURAL COMMISSIONER IS REQUIRED TO POSSESS AND USE THIS BAIT MATERIAL.

FOR DISTRIBUTION AND USE ONLY IN CALIFORNIA

USE RESTRICTIONS

For use against GROUND SQUIRRELS, MEADOW MICE, COTTON RATS, NORWAY and ROOF RATS.

IMPORTANT

Do not apply bait where trees or grass are wet, or when rain is likely to occur within 24 hours. For application only in rural locations.

Active Ingredients: Zinc Phosphide 2.00%
Inert Ingredients: 98.00%
Total: 100.00%

KEEP OUT OF REACH OF CHILDREN

CAUTION

STATEMENT OF PRACTICAL TREATMENT

IF SWALLOWED: CALL A PHYSICIAN OR POISON CONTROL CENTER IMMEDIATELY: Drink 1 or 2 glasses of water and induce vomiting by touching back of throat. Do not induce vomiting or give anything by mouth to an unconscious person.

REGISTRANT: California Department of Food and Agriculture
1220 'N' Street, Room A-357
Sacramento, CA. 94271-0001

CALIF. REG. NO. 0010963-50015 ZA

EPA SLN. NO. CA 890027

EPA EST. NO. 11224

NET CONTENTS

STORAGE AND DISPOSAL

Store in a locked warehouse in a properly posted area in such a manner as not to present a hazard to persons, animals, food, feed, crops, or property. Store in a dry place. Do not store around the home. Do not contaminate water, food, or feed by storage or disposal. Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

Completely empty bag into application equipment. Then, dispose of empty bag in a sanitary landfill or by incineration, or, if allowed by State or local authorities, by burning. If burned, stay out of smoke.

Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

1st Generation Anticoagulants

- Consumer size ≤ 1pound of bait above ground in a bait stations.
- Underground baiting for pocket gophers exempt, can use grain or pellets for manual underground baiting.
- Agricultural use or professional applicators:
  - Does not have to be sold in a bait station, but label must require if children or non-target animals have access.
  - Any form of bait acceptable.
  - Must be sold in packages containing more than 4 pounds of product.

Number of Products Registered In California

	Total	Home
Warfarin	17	10
Diphacinone	54	31
Chlorophacinone	17	10
Difenacoum	1	
Difethialone	25	
Brodifacoum	23	
Bromadiolone	54	
Bromethalin	34	30
Cholecalciferol	6	6
Zinc Phosphide	27	7

2nd Generation Anticoagulant homeowner uses will no longer be available in California

Products Available to Homeowners

- Solid bait blocks, sold in packages containing 1lb of bait, would be the only form of rodenticide bait approved for the consumer market (No 2nd Gen).
- Tamper-resistant bait stations sold pre-loaded with bait blocks.
  - Refills can be packaged for sale with at least one pre-loaded bait station.
  - Bait stations must meet one of four categories of specifications.

Impacts to Agriculture From 1998 RED

- Current field uses (e.g. in orchards and rangelands) include products containing chlorophacinone, diphacinone, and zinc phosphide[2].
  - Federal Restricted Materials.
- 2nd generation anticoagulants for non-field uses.
  - However, above ground placements must be in a tamper-resistant bait station.

[2]Zinc phosphide is currently a Federal Restricted Material

Economic Impact

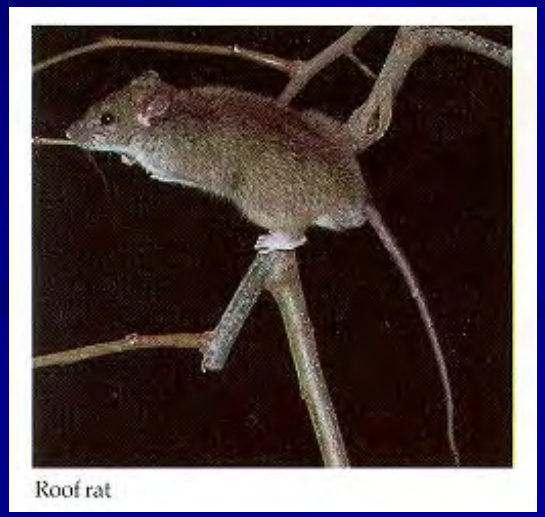
- A 1997 * study of 19 crops in California valued at $8 billion suffered an mean estimated loss due to non-predator vertebrates of $95.9 million. (range was $43.2 to $155.7 million)
- It was estimated that 400 jobs annually are lost as a result of vertebrate damage.
- The results represent the lower end of total impacts because of the selected crops studied. Also, many agricultural related problems such as infrastructure damage were not considered.

(*Hueth, Cohen, Sangrujee, and Zilberman, UCBerkley)

Vertebrate Pest Disease and Health Issues

- Rabies
- Relapsing Fever
- Sylvatic Plague
- Rock Mountain Spotted Fever
- Rat Bite Fever
- Tularemia
- Toxoplasmosis
- Babesiosis
- Coccidiomycosis
- Colorado Tick Fever
- Hantavirus Pulmonary Syndrome
- Leptospirosis
- Lyme Disease
- Murine Typhus Fever

How will we continue to control rodent pests?



Roof rat

What do We Propose?

- Create a Private Applicator exam specifically for field use rodenticide products.
- Use the Kiosk as an exam delivery system to minimize impact to County staff.
- Allow “Ranchette” owner/operators to become certified private applicators.

What Happens if…..

- No exam, 100’s of users unable to purchase and use any field use rodenticide. Potential reservoir of reinfestation and disease. Economic impacts will be extensive.

- Specific exam, better prepared and trained individuals using the same products they used previously. Under the Field Use Rodenticide Private Applicator Certification.

WEB SITES

http://icwdm.org/

www.vpcrac.org

http://www.ipm.ucdavis.edu/

http://www.invasivespeciesinfo.gov

Thank you !