



## MANAGEMENT OF POCKET GOPHERS

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Vertebrate Pest Specialist  
Montana Department of Agriculture



1

## SOME POCKET GOPHERS OF THE U.S.

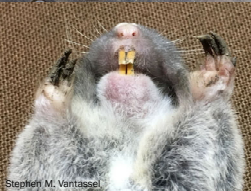


Plains PG (dark)      Northern PG      **Southeastern PG**  
Botta's PG (light)      Yellow-faced PG      Southern PG



2

## POCKET GOPHERS

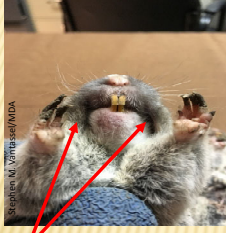



- ✖ Color tends to match soil color
- ✖ Small eyes & ears
- ✖ Nearly naked tail
- ✖ Long claws for digging
- ✖ Not a "mole"
- ✖ Avoids wet or shallow/rocky soils



3

## POCKET GOPHER

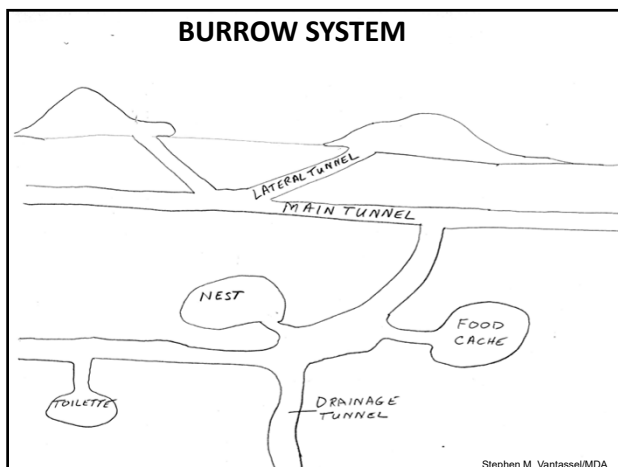


- ✖ Used to carry root clippings
- ✖ Fur is clean and well groomed
- ✖ Moves in both directions

Pouches on outside of cheeks



4



5

## POCKET GOPHER CAPABILITIES




- ✖ Moves 254 cu/ft of soil acre/yr<sup>1</sup>
- ✖ Burrow has a volume of at least 24 cu/ft<sup>1</sup>.
- ✖ Digs ½ to 1-inch/minute<sup>2</sup>



6

### LIFE CYCLE

- ✖ Solitary
  - + Except when breeding
  - + Except when rearing young<sup>1</sup>
- ✖ Breed in early Spring
  - + (April-May)<sup>2</sup>
  - + 21-day gestation period
- ✖ Active all year
  - + do not hibernate



7

### HABITAT & REPRODUCTION

Grassland – 3 to 5 young<sup>4</sup>Alfalfa—5 to 7 young<sup>1</sup>

Grown young establish own burrow systems late summer to fall (July-Sept<sup>2</sup>)



8

### DAMAGE

- Reduce yields by
- ✖ Mounds that bury vegetation
  - ✖ Consumption of roots
  - ✖ Can reduce alfalfa production by ~23%<sup>1</sup> and rangeland production by 18%<sup>2</sup>



Photo UNL



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9

### DAMAGE



Mounds damage equipment

Destroy plastic & rubber piping 2.1" in diameter or smaller<sup>1</sup>

10

### HOW ABOUT THESE? SOIL CASTES



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11

### POCKET GOPHER VS. GROUND SQUIRREL

- |                     |                      |
|---------------------|----------------------|
| ✖ No holes          | ✖ Holes              |
| ✖ Mounds            | ✖ Small or no mounds |
| ✖ Rarely see the PG | ✖ Often see the GS   |



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12

### HABITAT MODIFICATION<sup>1</sup>

| Land Use <sup>1</sup> | Pocket Gopher Preference | Potential Pop. Densities/acre |
|-----------------------|--------------------------|-------------------------------|
| Alfalfa               | 100% ❤️                  |                               |
| Pasture               | 80%                      | 38.4 <sup>2</sup>             |
| Disturbed grsslnd     | 70%                      |                               |
| Woodland              | 50%                      | 2 <sup>2</sup>                |
| Wetlands              | 20%                      |                               |
| Annual crops          | 0% 💀                     |                               |

13

### FIELD TREATMENT: 2,4-D

- + Reduced PGs by 87%
- + Reduced forbs by 83%
- + PG diet changed from 82% forbs 18% grass to 50/50



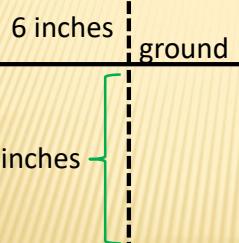
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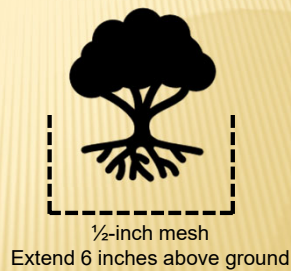
14

### EXCLUSION

#### Fence Property (not perfect)



#### Protect Plantings



15

### CULTURAL CONTROL

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Annual crops



Deep plowing



Flood irrigation

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16

### PESTICIDES-TOXICANTS



- ✗ Read label BEFORE purchasing
- ✗ Follow Label Instructions
- ✗ What kills them can kill you!

THE LABEL IS THE LAW!

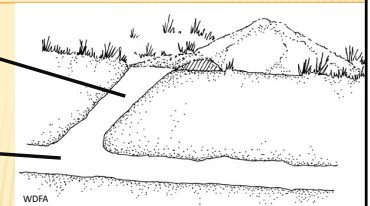


17

### POCKET GOPHER TUNNEL SYSTEMS

Lateral Tunnel

Main Tunnel



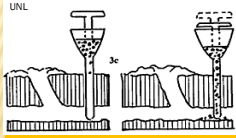
WDFA



18

### BAITERS FOR POCKET GOPHERS

- ✖ Applicators release bait into the burrow.
- ✖ Close hole with foot.



1½ acres/hr<sup>1</sup>

0.125 to 1 pd/acre<sup>2</sup>



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19

### HAND BAITING



Photo: Web

A cutaway to show bait placement.

1. Use probe to locate tunnel
2. Use funnel to place bait
3. Plug hole
4. Disperse mound

#### Tips

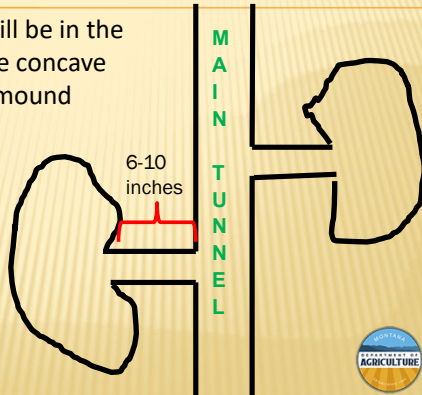
- ✖ Use care not to smother bait with soil
- ✖ Close surface hole carefully



20

### BAITING POCKET GOPHER TUNNELS

- ✖ Main tunnel will be in the direction of the concave or flat part of mound



View from above



21

### READING A POCKET GOPHER FIELD



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Photo: Web

- ✖ Focus on areas with FRESH Mounds

- ✖ Where would you start to probe for the main tunnel?



22

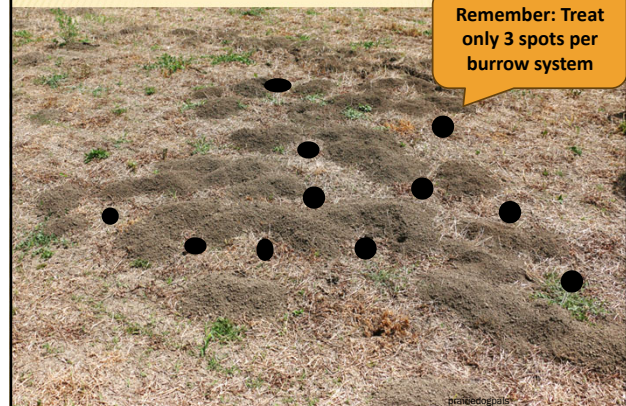
### WHERE WOULD YOU PROBE?



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23

### WHERE WOULD YOU PROBE HERE?



Remember: Treat only 3 spots per burrow system

24

## OVERWHELMED?

- ✖ Knock down the mounds
- ✖ Monitor
- ✖ Treat new ones



25

## TOXICANTS-NON-ANTICOAGULANTS

### Zinc phosphide



Less effective

### Strychnine



More effective

Both sensitive to excessive moisture



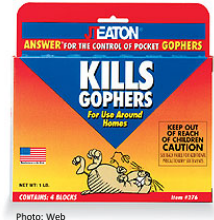
26

## STRYCHNINE APPLICATORS MUST WEAR



27

## ANTICOAGULANTS



- ✖ Chlorophacinone & Diphacinone<sup>1</sup>.
- + Multiple-dose toxicants
- + More bait needed
- + Bait tolerates moist/wet conditions better



28

## EFFICACY RATES

~3 hours to hand-bait 10 acres<sup>5</sup>

| Toxicant        | Avg <sup>8</sup> | Low                | High                               |
|-----------------|------------------|--------------------|------------------------------------|
| Strychnine      | 70%              | 30% <sup>2</sup>   | 72% <sup>1</sup> -83% <sup>4</sup> |
| Zinc Phosphide  | 40-50%           | 13% <sup>1,3</sup> | 62% <sup>4</sup>                   |
| Chlorophacinone | 50%              | 0% <sup>2</sup>    | 77-95% <sup>7</sup>                |
| Diphacinone     | 0-30%            | 0% <sup>2</sup>    | 62% <sup>1</sup> -78% <sup>6</sup> |

29

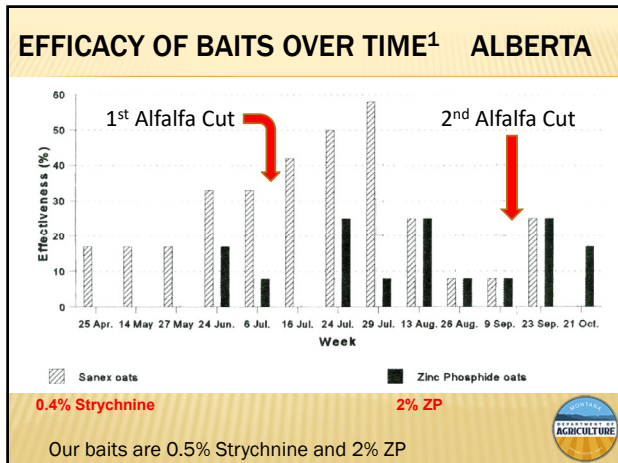
## ALFALFA & RODENTICIDES



- ✖ Palatability of alfalfa makes PG control challenging<sup>1</sup>
- ✖ Bait after cutting (mid-summer)<sup>1</sup>



30



31

### COSTS

Use strychnine baits within 60 days of purchase

| Toxicant                       | Amt/Sys   | Price (2022)        | Pds      |
|--------------------------------|-----------|---------------------|----------|
| ZP Oats Bait Ag <sup>4</sup>   | 1 tsp/2   | \$60.00             | 33       |
| Strychnine (Milo) <sup>2</sup> | 1 tsp/2   | \$161.00+S&H        | 50       |
| Strychnine (Oats) <sup>2</sup> | 1 tsp/2   | \$170.00+S&H        | 50       |
| Chlorophacinone <sup>4</sup>   | ½ cup/2-3 | \$126.25            | 25       |
| Diphacinone <sup>5</sup>       | ½ cup/2-3 | \$88.00<br>\$118.00 | 30<br>50 |

32

### MATERIALS COSTS-2010 VINEYARD STUDY<sup>1</sup>

| Toxicant      | Price    | Pds   | 10 ac        | Cost          |
|---------------|----------|-------|--------------|---------------|
| ZP            | \$56.10  | 33    | 60lbs        | 147.16        |
| Strychnine    | \$249.75 | 50    | 20lbs        | 249.93        |
| Anticoagulant | 93.75    | 50    | 1,316.25     | 2,625.00      |
| AP            | \$23.73  | Flask | 30-40 flasks | 711.90-949.20 |

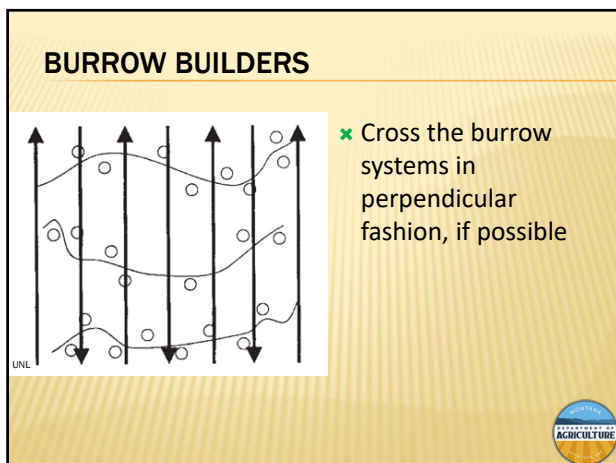
33

### BURROW BUILDERS

- ✖ Soil must congeal
- ✖ Check tunnel depth
- ✖ Check tunnel integrity
- ✖ Turn off feeder before turns!
- ✖ Watch the weather

Label **MUST** say toxicant is for use in a burrow builder!!

34



35

### FUMIGANTS FOR POCKET GOPHERS (RUP)

- ✖ Most effective when
  - + Soil is moist
  - + Soil is a loam or clay
  - + Tunnel system is small (new)
- ✖ P. gophers may sense gas and push soil between it and them.
- ✖ Not recommended as primary control due to costs
- ✖ Place pellets/tablets in 2 locations in each burrow syst.
- ✖ (Monitor & apply again as needed. 2 treatments can achieve 84% efficacy or higher)<sup>1</sup>

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500 Tblets<sup>2</sup>  
2450 Plts<sup>3</sup>  
FMP Required

36

## ALUMINUM PHOSPHIDE TESTING

- ✖ Glass Testers
- ✖ \$279.00 pump<sup>1</sup> + \$99.00 10/tubes (2024)<sup>2</sup>
- ✖ Metered Testers
- ✖ \$719 and up (2024)<sup>3</sup>
- ✖ Calibration



37

## WHEN LIMITS ARE EXCEEDED

- ✖ STEL-Short Term Exposure Limit (1.0ppm)
- ✖ 8-hour TWA-Time Weighted Avg (0.3ppm)<sup>1</sup>
- ✖ Respirator must<sup>2</sup>
  - + Fit
  - + Be rated for Phosphine
  - + Seal check



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38

## GOPHER GENERAL



- ✖ Burrow Builder for AP
- ✖ Fields, including alfalfa
- ✖ Built in Canada
- ✖ Legal
- ✖ Research?

Wear gloves per label



39

## PRESSURIZED EXHAUST (PERC®)<sup>1</sup>

Photo: Web



- ✖ Not regulated
- ✖ Carbon monoxide
- ✖ ~62% successful in pocket gopher
- ✖ Fastest application method
- ✖ Study done in CA

Cost: \$8,203-\$25,550 (2024)<sup>2</sup>

40

## PROPANE/OXYGEN DEVICES

### Results

- ✖ 12% reduction<sup>1</sup>

### Safety

- ✖ Avoid subterranean utilities (i.e. gas & water lines)
- ✖ Account for fire hazards<sup>2</sup>
- ✖ Eye/Ear and body protection

Cost to purchase \$2,400+<sup>3</sup>

41

## Trapping

- ✖ Best control (92% efficacy)<sup>1</sup>
- ✖ Training improves efficiency<sup>2</sup>
- ✖ Anchor traps with wire, not string
- ✖ All the traps work. Gophinator has good reputation.<sup>3</sup>



Macabee \$9.00

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DK-2 \$14.00

Gophinator<sup>3</sup> \$9.00

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42

## TRAPPING

- ✖ Best for small acreages or as a cleanup
- ✖ Set freshest mounds
- ✖ Probe to locate plug
- ✖ Remove the soil with a trowel.



Dig through here

Narrow Blade  
Trapper's Shovel



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43

## SETTING GOPHER TRAPS

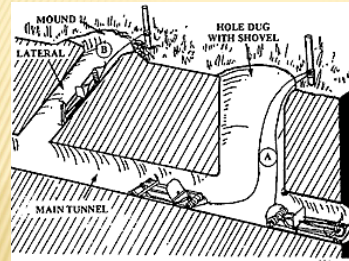


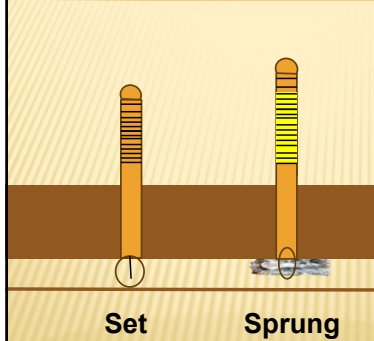
Photo: UNL

- ✖ Always place traps below ground
- ✖ Always wire-tie them to a stake. Surveyor's flag will suffice.



44

## GOPHERHAWK



San Diego Seed Co.

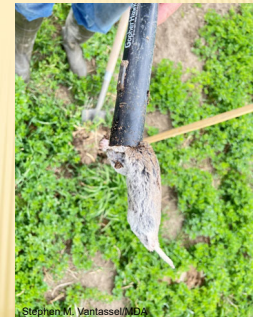


45

## GOPHERHAWK



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46

## QUACKERY & ILLEGALITY

- ✖ Spearmint Gum<sup>1</sup>
  - + Wrapped
  - + Unwrapped
  - + Eaten with no ill effects
- ✖ Anhydrous Ammonia<sup>2</sup>
  - + Off-label use
  - + Only 46% efficacy



tvandgumareawesome.com



Uky.edu



47

## CAUTION!!!

- ✖ Have realistic expectations!!
- ✖ Efficacy of dry toxicants in alfalfa can be low.<sup>1</sup>



Photo: Web

Wishes only take you so far



48

## BEST PRACTICES

- ✖ 20-30% of pocket gophers aren't building mounds at any given time<sup>1</sup>
- ✖ Plan to control a second time in 2 to 3 weeks (twice a year)

Caddyshack



49

## TIMING AND PERSISTENCE

- ✖ Consider control 2x/yr
  - + After thaw
  - + Before freeze up
- ✖ Control after cutting!
- ✖ Control as large an area as possible
- ✖ Goal is <2 pg/acre<sup>1</sup>



Cooper trying (and failing) to get a pocket gopher



50

## REINVASION PROBLEM

- ✖ Young pocket gophers occupy poor ground and invade good ground when not occupied<sup>1</sup>
- ✖ Reinvasion can result in higher numbers than untreated areas.



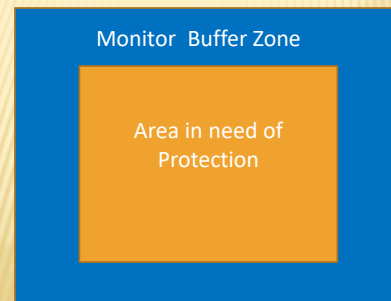
After 6 months, 86% of burrows can be invaded!<sup>2</sup>



51

## MONITORING ZONE

- ✖ Create a buffer zone (400 ft wide<sup>1</sup> or 200 ft wide)<sup>2</sup>
- ✖ Monitor Monthly (March-October)



52

## RESOURCES

- ✖ MT Dept of Ag website
- ✖ Pocket Gopher Control Techniques Bulletin
- ✖ Revised in 2023



<https://agr.mt.gov/Vertebrate-Pests>



53

## QUESTIONS?

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[svantassel@mt.gov](mailto:svantassel@mt.gov)



Stephen putting in a pocket gopher set

<https://agr.mt.gov/Vertebrate-Pests>

Download Pubs Here



54

## CONTROL

### Complete removal of PG

- ✖ On areas up to 4.5 acres had little or no effect on population numbers the following year



55

## NEED YOUR HELP TO LOBBY THE EPA

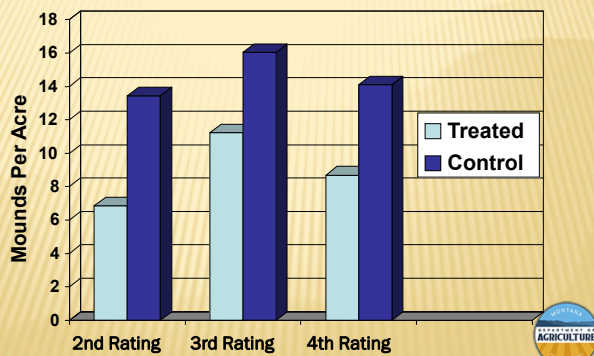
### Letters of Support for SLN

- ✖ Production losses due to prairie dogs
- ✖ Need for flexible use of rodenticides that are provided by SLNs
- ✖ Use of Zinc Phosphide grain for control of prairie dogs during summer
- ✖ Letters that describe your experience are helpful.
- ✖ Include your full contact info & business name



56

## 2006 P. GOPHER TRIAL #2



57

## EVALUATION TECHNIQUE

Opened all burrows after treatment



Evaluated whether closed or open 24-48 hrs after treatment<sup>1</sup>



58

## 3 WAYS TO HAND BAIT

Hand baiting through mound

½ acre/hr<sup>1</sup>

Use of probe with bait applicator

1½ acres/hr<sup>1</sup>

Gopher Snake:  
Bait applicator

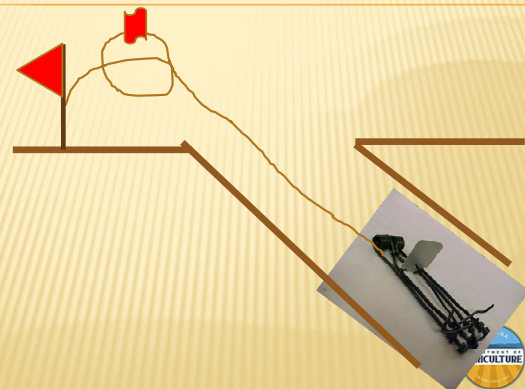


Image: UNL



59

## TRAP CHECK TECHNIQUE<sup>1</sup>



60

### CARBON MONOXIDE-BURROW R<sub>x</sub>®<sup>1</sup>



- ✖ Not regulated
- ✖ Manual says follow CA laws<sup>2</sup>
- ✖ Claims can kill PG, Rats, & GS in 3 min<sup>3</sup>
- ✖ Uses Smoke Oil to enhance smoke visibility

Quality Manufacturing & Distributing, Inc.  
 Cost \$2,550 ppd (2024)  
 +\$181.95/12 smoke oil & 24' hose  
 \$284.00<sup>5</sup>  
 Not legal on US Forestry Land<sup>4</sup>



61