



MANAGEMENT OF POCKET GOPHERS

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Vertebrate Pest Specialist
Montana Department of Agriculture




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SOME POCKET GOPHERS OF THE U.S.

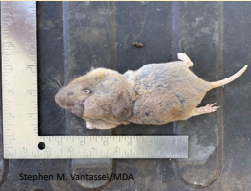



Plains PG (dark) Northern PG **Southeastern PG**
Botta's PG (light) Yellow-faced PG Southern PG




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POCKET GOPHERS

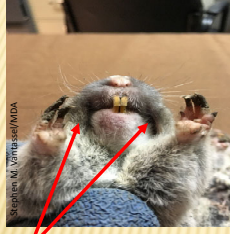



- ✗ Color tends to match soil color
- ✗ Small eyes & ears
- ✗ Nearly naked tail
- ✗ Long claws for digging
- ✗ Not a "mole"
- ✗ Avoids wet or shallow/rocky soils




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POCKET GOPHER

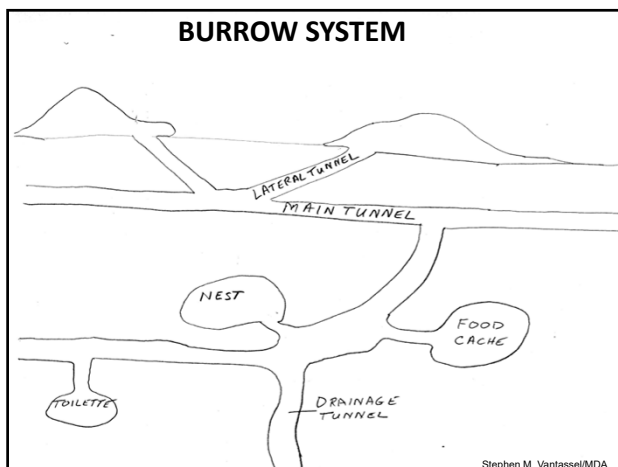


- ✗ Used to carry root clippings
- ✗ Fur is clean and well groomed
- ✗ Moves in both directions

Pouches on outside of cheeks





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POCKET GOPHER CAPABILITIES

- ✗ Moves 254 cu/ft of soil acre/yr¹
- ✗ Burrow has a volume of at least 24 cu/ft¹.
- ✗ Digs ½ to 1-inch/minute²



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LIFE CYCLE

- ✖ Solitary
 - + Except when breeding
 - + Except when rearing young¹
- ✖ Breed in early Spring
 - + (April-May)²
 - + 21-day gestation period
- ✖ Active all year
 - + do not hibernate



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HABITAT & REPRODUCTION

Grassland – 3 to 5 young⁴Alfalfa—5 to 7 young¹

Grown young establish own burrow systems late summer to fall (July-Sept²)



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DAMAGE

Reduce yields by

- ✖ Mounds that bury vegetation
- ✖ Consumption of roots
- ✖ Can reduce alfalfa production by ~23%¹ and rangeland production by 18%²



Photo UNL



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DAMAGE



Mounds damage equipment



Destroy plastic & rubber piping 2.1" in diameter or smaller¹



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HOW ABOUT THESE? SOIL CASTES



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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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HABITAT MODIFICATION¹

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

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FIELD TREATMENT: 2,4-D

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



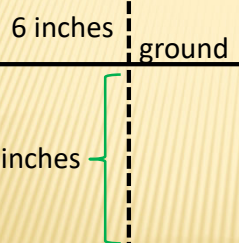
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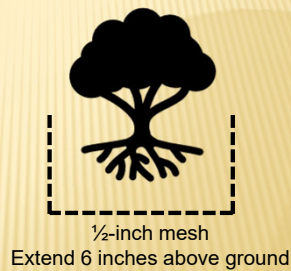
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EXCLUSION

Fence Property (not perfect)



Protect Plantings



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CULTURAL CONTROL

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Annual crops



Deep plowing



Flood irrigation

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PESTICIDES-TOXICANTS



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

THE LABEL IS THE LAW!

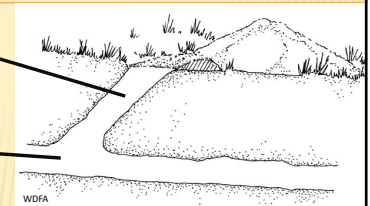


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POCKET GOPHER TUNNEL SYSTEMS

Lateral Tunnel

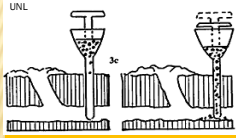
Main Tunnel



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BAITERS FOR POCKET GOPHERS

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



1½ acres/hr¹

0.125 to 1 pd/acre²



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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

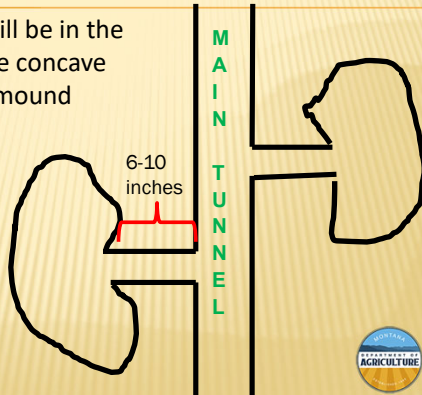
- ✖ Use care not to smother bait with soil
- ✖ Close surface hole carefully



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BAITING POCKET GOPHER TUNNELS

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



View from above



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READING A POCKET GOPHER FIELD



- ✖ Focus on areas with FRESH Mounds



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



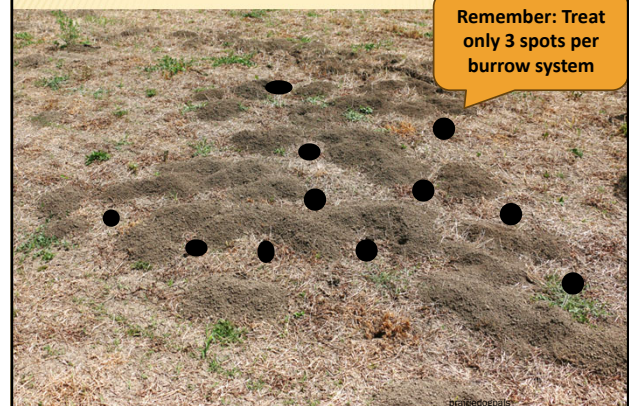
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WHERE WOULD YOU PROBE?



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WHERE WOULD YOU PROBE HERE?



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OVERWHELMED?

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



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TOXICANTS-NON-ANTICOAGULANTS

Zinc phosphide



Less effective

Strychnine



More effective

Both sensitive to excessive moisture



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STRYCHNINE APPLICATORS MUST WEAR



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ANTICOAGULANTS



- ✖ Chlorophacinone & Diphacinone¹.
- + Multiple-dose toxicants
- + More bait needed
- + Bait tolerates moist/wet conditions better



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EFFICACY RATES

~3 hours to hand-bait 10 acres⁵

Toxicant	Avg ⁸	Low	High
Strychnine	70%	30% ²	72% ¹ -83% ⁴
Zinc Phosphide	40-50%	13% ^{1,3}	62% ⁴
Chlorophacinone	50%	0% ²	77-95% ⁷
Diphacinone	0-30%	0% ²	62% ¹ -78% ⁶

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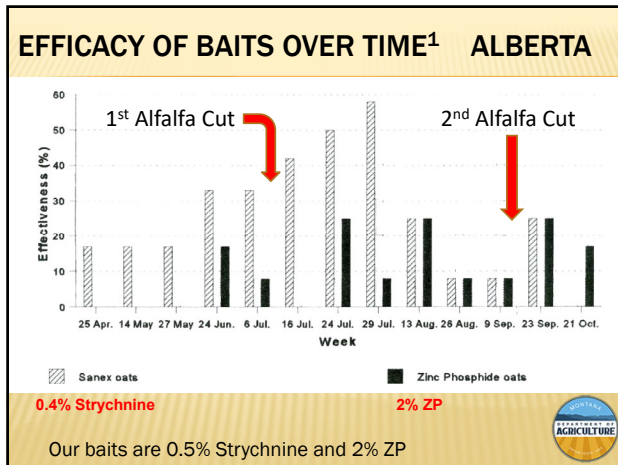
ALFALFA & RODENTICIDES



- ✖ Palatability of alfalfa makes PG control challenging¹
- ✖ Bait after cutting (mid-summer)¹



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COSTS

Use strychnine baits within 60 days of purchase

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

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MATERIALS COSTS-2010 VINEYARD STUDY¹

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

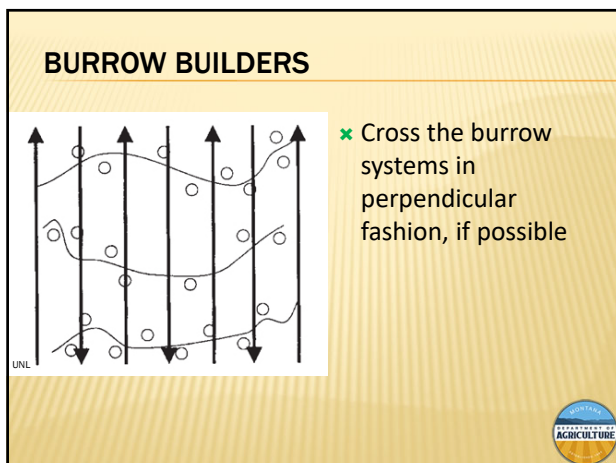
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BURROW BUILDERS

- ✖ 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!!

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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)¹

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500 Tblets²
2450 Plts³
FMP Required

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ALUMINUM PHOSPHIDE TESTING

- ✖ Glass Testers
- ✖ \$279.00 pump¹ + \$99.00 10/tubes (2024)²
- ✖ Metered Testers
- ✖ \$719 and up (2024)³
- ✖ Calibration



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WHEN LIMITS ARE EXCEEDED

- ✖ STEL-Short Term Exposure Limit (1.0ppm)
- ✖ 8-hour TWA-Time Weighted Avg (0.3ppm)¹
- ✖ Respirator must²
 - + Fit
 - + Be rated for Phosphine
 - + Seal check



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GOPHER GENERAL



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

Wear gloves per label



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PRESSURIZED EXHAUST (PERC®)¹

Photo: Web



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

Cost: \$8,203-\$25,550 (2024)²

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PROPANE/OXYGEN DEVICES

Results

- ✖ 12% reduction¹

Safety

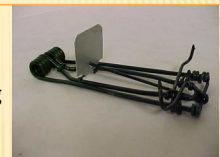
- ✖ Avoid subterranean utilities (i.e. gas & water lines)
- ✖ Account for fire hazards²
- ✖ Eye/Ear and body protection

Cost to purchase \$2,400+³

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Trapping

- ✖ Best control (92% efficacy)¹
- ✖ Training improves efficiency²
- ✖ Anchor traps with wire, not string
- ✖ All the traps work. Gophinator has good reputation.³



Macabee \$9.00

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DK-2 \$14.00

Gophinator³ \$9.00

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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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SETTING GOPHER TRAPS

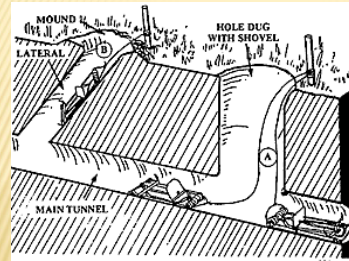


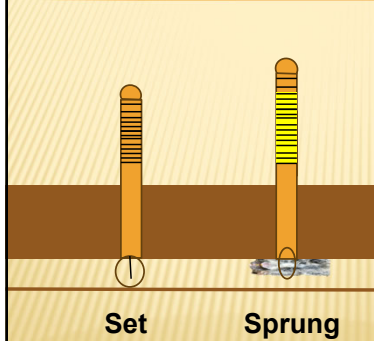
Photo: UNL

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



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GOPHERHAWK



San Diego Seed Co.



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GOPHERHAWK



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QUACKERY & ILLEGALITY

- ✖ Spearmint Gum¹
 - + Wrapped
 - + Unwrapped
 - + Eaten with no ill effects
- ✖ Anhydrous Ammonia²
 - + Off-label use
 - + Only 46% efficacy



tvandgumareawesome.com



Uky.edu



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CAUTION!!!

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



Photo: Web

Wishes only take you so far



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BEST PRACTICES

- ✖ 20-30% of pocket gophers aren't building mounds at any given time¹
- ✖ Plan to control a second time in 2 to 3 weeks (twice a year)

Caddyshack



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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/acre¹



Cooper trying (and failing) to get a pocket gopher



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REINVASION PROBLEM

- ✖ Young pocket gophers occupy poor ground and invade good ground when not occupied¹
- ✖ Reinvasion can result in higher numbers than untreated areas.



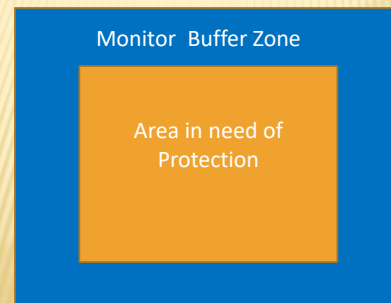
After 6 months, 86% of burrows can be invaded!²



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MONITORING ZONE

- ✖ Create a buffer zone (400 ft wide¹ or 200 ft wide)²
- ✖ Monitor Monthly (March-October)



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RESOURCES

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



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



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QUESTIONS?

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Stephen putting in a pocket gopher set

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

Download Pubs Here



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CONTROL

Complete removal of PG

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



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NEED YOUR HELP TO LOBBY THE EPA

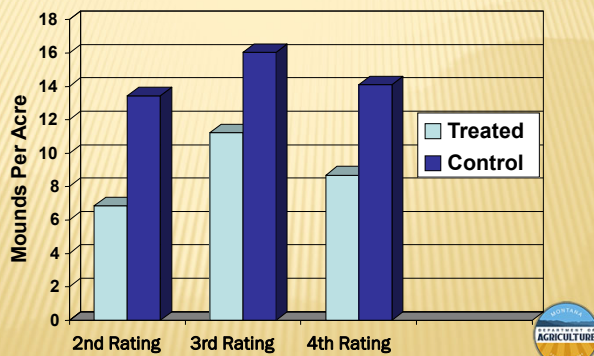
Letters of Support for SLN

- ✖ 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



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2006 P. GOPHER TRIAL #2



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EVALUATION TECHNIQUE

Opened all burrows after treatment



Evaluated whether closed or open 24-48 hrs after treatment¹



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3 WAYS TO HAND BAIT

Hand baiting through mound

½ acre/hr¹

Use of probe with bait applicator

1½ acres/hr¹

Gopher Snake:
Bait applicator

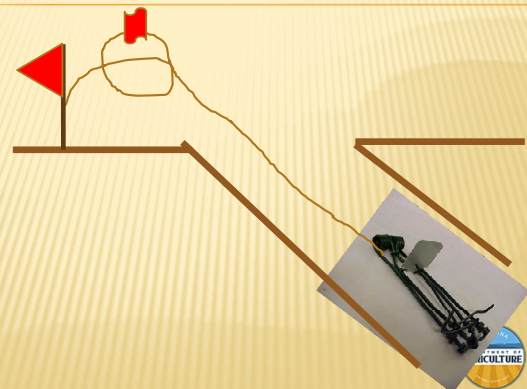


Image: UNL




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TRAP CHECK TECHNIQUE¹




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CARBON MONOXIDE-BURROW R_x®¹



- ✖ Not regulated
- ✖ Manual says follow CA laws²
- ✖ Claims can kill PG, Rats, & GS in 3 min³
- ✖ Uses Smoke Oil to enhance smoke visibility

Quality Manufacturing & Distributing, Inc.
 Cost \$2,550 ppd (2024)
 +\$181.95/12 smoke oil & 24' hose
 \$284.00⁵
 Not legal on US Forestry Land⁴



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