

Pesticides

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GOALS

- 1- Rodenticides.**
- 2- Fungicides.**
- 3- Herbicides.**
- 4- Dioxins.**

Rodenticides

- **Def:-** Chemicals used for combating rodents (mice and rats).
- **Rodenticides are classified into:**

Organic

- **Anticoagulants**
(Coumarin preparations)
- Alpha naphthyl thio urea (ANTU).
- Sodium fluoroacetate
- Strychnine.
- Endrin

In organic

- **Zinc phosphide** (Zn_3P_2)
- Arsenic trioxide (As_2O_3)
- Barium carbonate ($BaCO_3$)
- Phosphorus element (P)
- **Aluminium phosphide**

Anticoagulants

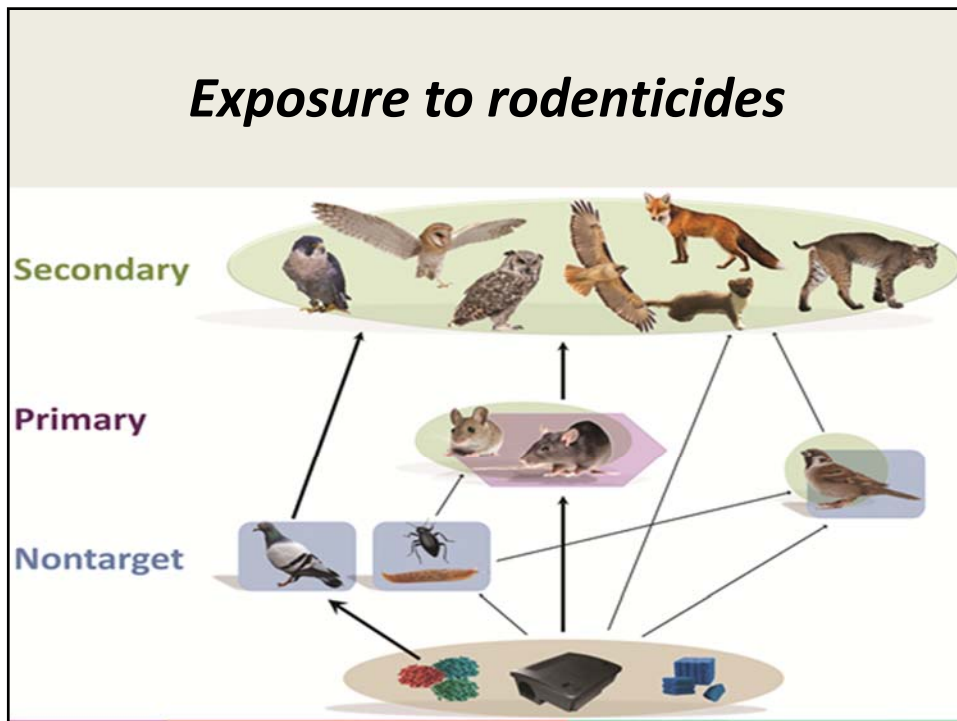
- 1- **First generation** (multiple doses to cause intoxication):
Warfarin and dicoumarol (coumarin derivatives)
 - 2- **Second generation** (more potent, single dose to cause intoxication): **super warfarins, Difenacoum, Bromodiolone, Racumin, Rattak.....**
- 2) Grains or pellets covered with the colored rodenticide.



Colored feed pellets with rodenticide.



- All (acute) rodenticides used in bait while anticoagulants (chronic) used as colored cereals.
- Colored pellets are attractive for birds.



- **Mode of action:-**

- Anticoagulant rodenticides disrupt the normal blood clotting mechanisms through **inhibition of formation of prothrombin from Vit. K (liver)**, resulting in increased tendency to bleed and profuse hemorrhage.
- Prolonged clotting times and damage to the blood capillaries.
- **Factors that enhance the action of anticoagulants:** Vit. K deficiency, dietary factors, long course administration of antibiotics and liver diseases.

Clinical Signs :-

-Bleeding :-

- 1) **Nose bleeding**
- 2) **Bloody diarrhea.**
- 3) **Bleeding Gum.**
- 4) **Bloody vomit & urine (hematuria).**
- 5) **bruises due to ruptured blood vessels**
- 6) **Pale mucous membranes due to anemia.**
- 7) **General exhaustion and general weakness**

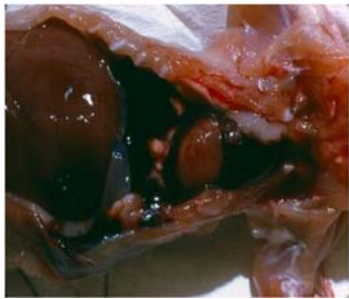
NB: warfarin is **teratogenic if pregnant animal exposed to it.**



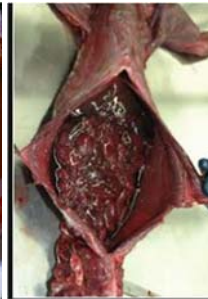
PM:-

- Hemorrhages in the internal organs as well as the eyes, mouth and other organs.
- Pale mucous membranes.
- Collected liquid blood in the body cavities.

Thoracic hemorrhage, anticoagulant rodenticide poisoning



Mesenteric hemorrhage, anticoagulant rodenticide poisoning



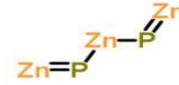
✓ TREATMENT:-

- The poisoned animal should be kept quite and avoid traumas.
- **Vit. K injection (specific antidote)** in a dose of 1 mg/kg I/V followed by I/M for 5 days.
- Blood transfusion if possible.
- Blood substitutes (fluid therapy) as glucose or saline solution.



Zinc phosphide

(inorganic rodenticide)

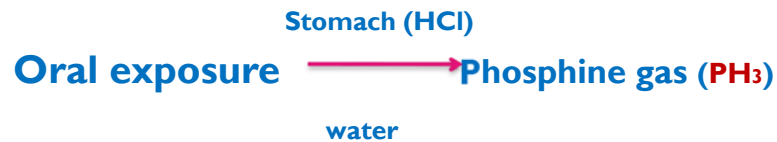


Zinc phosphide bait used around farms while

Aluminum phosphide used to fumigate grain

Zinc phosphide

- Dark grey powder, dangerous to animals and birds due to its high toxicity and lack of selectivity.



Phosphine gas is very toxic and causes death in poultry within 24 hours and in farm animals within 48-72 hours.

- Pulmonary edema.

- Clinical signs:-

- the same as phosphorus toxicity
- GIT irritation.
- ✓ - Vomiting (black)
- Garlic odor on the breath of intoxicated animals
- Abdominal pain
- Convulsions.
- Respiratory failure and death.

PM:-

Gastroenteritis (black stomach contents),
 Congestion of heart, Lung, Liver and Kidney.
 Lung edema.
 Odor of phosphine gas and zinc phosphide.

Treatment (Symptomatic)

- There is **no specific treatment** or specific antidote.
- Gastric lavage using **sodium bicarbonate**.
- **Fluid therapy**.
- **Symptomatic treatment**.

Fungicides

- Fungicides are used to prevent or treat fungal infections.
- They are used for **seed protection**, on **cereal crops**, fruits, vegetables and flowers, wood preservatives and in paint and plastics.
- **Poisoning in poultry and farm animals** usually has resulted from the incorporation of treated seeds or feed stuffs into poultry or animal feed.

- **Examples:**

- **1- Copper oxychloride:**

Toxicity of copper oxychloride is due to the presence of **copper** and characterized by:

- Hemolysis of RBCs. - Necrosis of hepatocytes.
- Corrosion and protein coagulation of GIT. - Toxicemic jaundice complex.

- **Treatment:**

- Penicillamine is the specific antidote given orally in a dose of 15-50 mg/kg body weight as chelating therapy.
- Molybdenum in the form of molybdate given orally.
- supportive treatment and fluid therapy is also recommended.

- **2- Mercurial fungicides** (ethyl or methyl mercuric chloride).

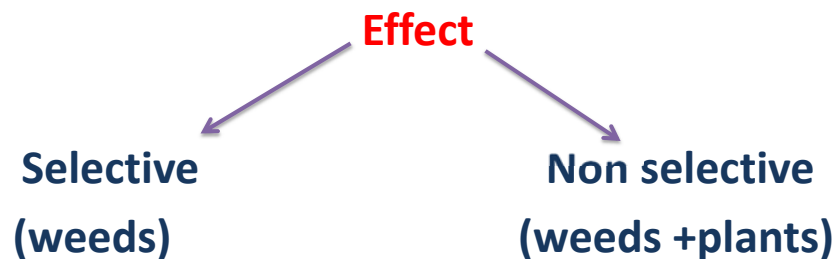
- **3- Anvil, Tilt 100, Trimiltox, Ridomil, Rubigan, Formaldehyde and Dithane (mancozeb).**

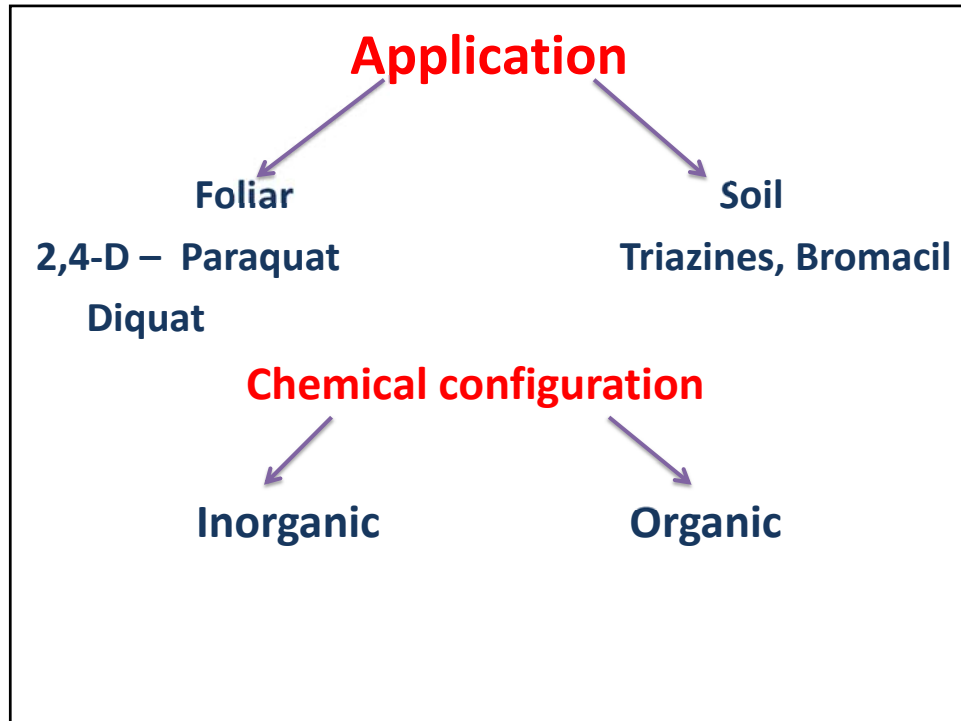
Herbicides (weed killer)

Def. chemicals used for weed control
(phytotoxic chemicals)

Classification of herbicides

According to :-





Herbicides:

1- The chlorphenoxy acid-type herbicides:

- 2, 4-D (2, 4-Dichlorophenoxy acetic acid),
- 2, 4, 5-T (2, 4, 5-Trichlorophenoxy acetic acid), and
- silvex [2- (2, 4, 5-Trichloropenoxy) propionic acid].

2- The triazine herbicides: atrazine, cyanazine, prometryn, metribuzin and simazine.

3- The carbamate and thiocarbamate compounds .

4- The bipyridyl compounds: paraquat and diquat

5- Sodium and potassium chlorates.

Toxicity:-

-**2,4-D** (Dichlorophenoxy acetic acid)

- Loss of appetite and weight
- Muscular weakness , paralysis of hind limbs
- Stiffness & paralysis
- Abortion, Dermatitis (cattle) dermal exposure

Treatment:

- Symptomatic treatment

Paraquat:-

Clinical signs

- Excitation , Convulsions & GIT Symptoms
- dyspnea and difficult respiration
- Respiratory distress after few days
- cyanosis
- Death due to respiratory failure (10 days)

PM Lung congestion & oedema

Treatment

- Gastric & skin wash
- Fuller's earth

Round up (glyphosate) herbicide

a systemic, broad-spectrum glyphosate based herbicide.

<https://www.youtube.com/watch?v=cG0G0JvmlHM>

<https://www.youtube.com/watch?v=o8QLR2SizJs>

The most recent problem August 14 /2018

Monsanto Roundup Weed killer **Case Cancer**
(lymphoma).

The judge ordered Monsanto co. to pay
289 million dollar.



Dibenzo -p-Dioxins (Dioxins)

- They are a class of substances **never intentionally** released to the environment which are formed as a result of contamination of commercial chemical products.
- They occur in very low concentrations in the environment.
- Highly toxic
- EX. **TCDD** (2,3,7,8- tetrachlorodibenzo-p-dioxin)
- TCDD is formed in the manufacture of the herbicide 2, 4, 5-T (2, 4, 5-Trichlorophenol).
- In Italy 2,4,5-T plant accident resulted in contamination of surrounding area with TCDD and caused mortalities of domestic & wild animals and suspected effect on human health.

- In Vietnam (1960) US army used 2,4-D & 2,4,5-T (**Agent orange**)
- Resulted in exposure to dioxins + herbicides.
- Dioxins also produced from burning vegetation treated with 2, 4, 5-T and 2, 4-D.

Toxic effects:-

- Delayed mortalities (2-8 weeks)
- Immunosuppressive effect
- Affect the enzymatic system
- Carcinogenic.
- in human being exposed to dioxin **chloracne**, which is a severe skin disease with **acne-like lesions** that occur mainly on the face and upper body.

