



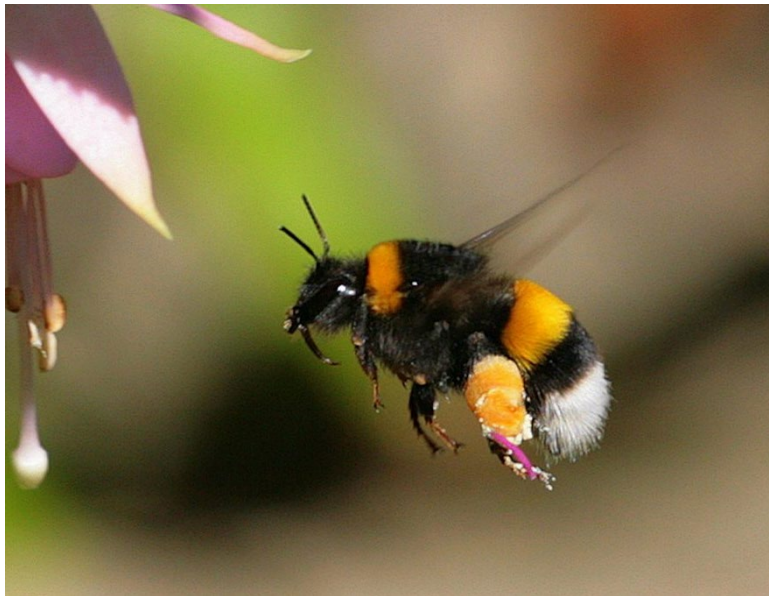
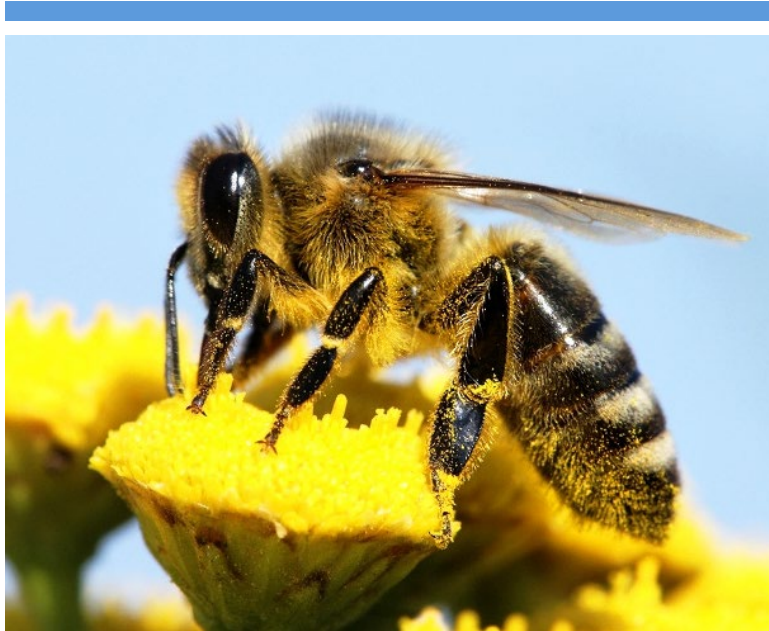
POLLINATORS & PESTICIDES

SHELLEY MILLS MSU EXTENSION AGRICULTURAL EDUCATOR

VALLEY COUNTY

POLLINATORS

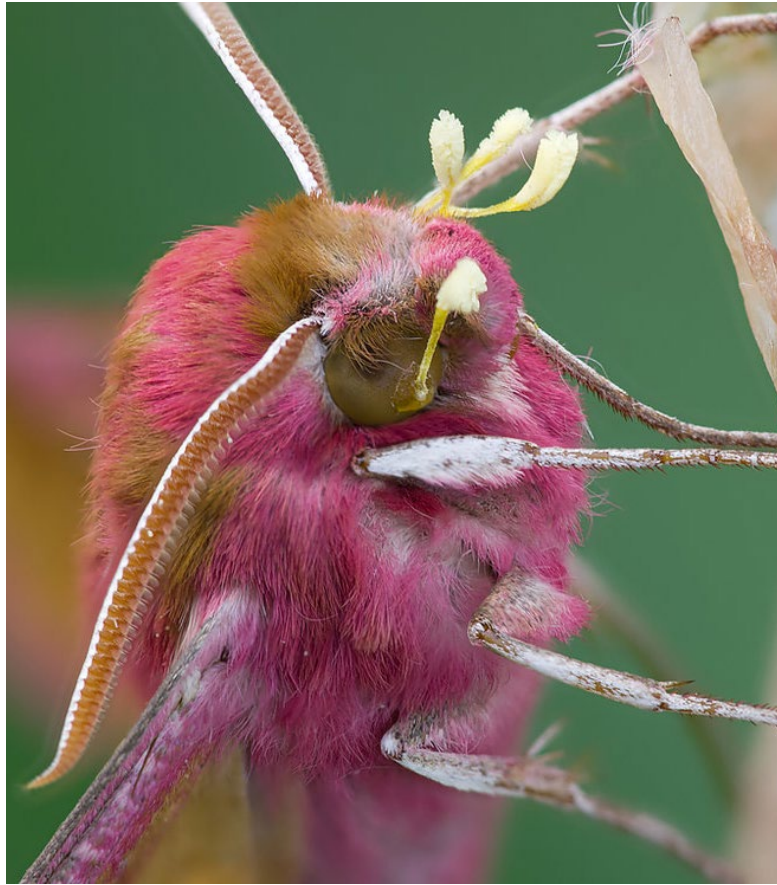
- Honey bees
- Native bees





POLLINATORS

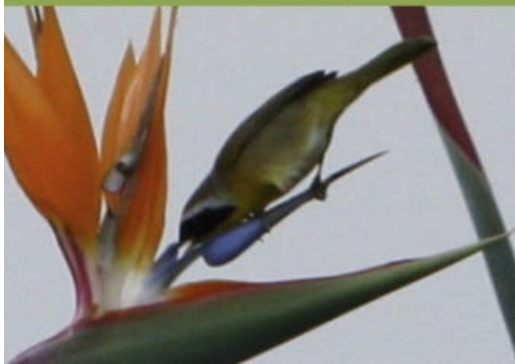
- Butterflies and Moths





POLLINATORS

- Beetles
- Ants
- Bats
- Birds



PESTICIDES

- Herbicides
- Insecticides
- Fungicides
- Rodenticides
- Avicides
- Piscicide
- Miticide





HISTORY OF PESTICIDES

- Paris Green (1870's)
- Cotton boll weevil (1920's)
- DDT, Carbamates, organophosphides (1940's)
- Agent Orange, 2,4-D & 2,4,5-T (War years)
- Synthetic Pyrethroids (1950's)



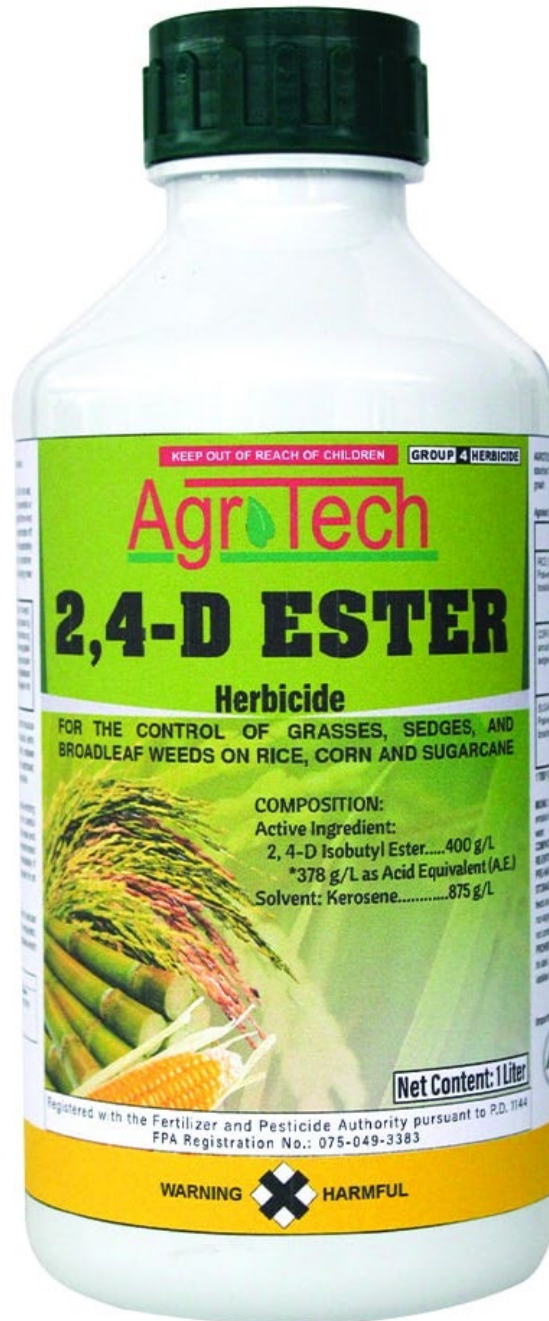
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HERBICIDES

- 2,4,5-T and 2,4-D (1943)
- Dinoseb (1945)
- Silent Spring (1962)
- Glyphosate (1974)



BANNED, RESTRICTED, AND VOLUNTARILY REMOVED



GARDEN TECH[®] **Sevin[®]**

INSECT KILLER DUST

READY TO USE



KILLS OVER 150 LISTED INSECTS
ON VEGETABLES, FRUITS, ORNAMENTALS & LAWNS

Sevin is a registered trademark of Garden Tech, Inc. and Garden Inc.

EPA Reg. No. 53883-484-71004
 EPA Est. 67572-GA-1, 67572-GA-2, 69703-GA-1, 69703-GA-2
 Subscript used is first letter of run code on container.

For Consumer Refund:
 TechPac LLC, PO Box 95437
 Palatine, IL 60095-0437

Please call
 1-866-945-5033

CAUTION: Harmful if swallowed, inhaled or absorbed through skin. Causes moderate eye irritation. Avoid breathing dust. Avoid contact with skin, eyes, or clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet.

ENVIRONMENTAL HAZARDS

This pesticide is toxic to fish and other aquatic organisms. To protect the environment, do not allow pesticide to enter or run off into storm drains, drainage ditches, gutters or surface waters. Applying this product in calm weather when rain is not predicted for the next 24 hours will help to ensure that wind or rain does not blow or wash pesticide off the treatment area. This product is highly toxic to bees exposed to direct treatment or residues on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds if bees are foraging the treatment area.

⚠ **NOTICE:** Cancer - www.P65Warnings.ca.gov

DIRECTIONS FOR USE

It is a violation of federal law to use this product in a manner inconsistent with its labeling.

IMPORTANT: READ ENTIRE LABEL BEFORE EACH USE.

For Outdoor Residential Use Only

This product is a ready-to-use insecticide dust, which exhibits effective control against the pests listed when used according to label directions. This product is non-injurious to most plants; even so, all varieties of plants have not been fully tested. Before treating large numbers of plants of a single variety or first treating material not previously tested, treat a small area and observe for injury prior to full scale application. Wait 5-7 days after treatment to evaluate results. Plants under stress (such as heat, drought, or frost damage) may be sensitive to this product. Treat surfaces to ensure thorough coverage but avoid runoff. To treat insects harbored in voids and cracks-and-crevices, applications must be made in such a manner to limit dripping and avoid runoff onto untreated structural surfaces and plants.

For most effective results, follow directions for specific use areas.

WHERE TO APPLY: Around Home Foundations, Lawns, Shrubs, Ornamental and Flower Gardens, Fruit and Vegetable Gardens.

WHEN TO APPLY: Apply early to prevent infestation. Otherwise, apply at the first signs of insect activity or damage.

RESTRICTIONS

- Do not apply this product in a way that will contact any person or pet, either directly or through drift. Keep people and pets out of the area during application. Do not allow people or pets to enter the treated area until dust has settled.
- Do not apply to pets or pet bedding/quarters.
- Do not make applications during rain. Avoid making applications when rainfall is expected.
- Rainfall within 24 hours after application may cause unintended runoff of pesticide application.
- Do not apply when the wind speed is greater than 15mph.
- Not for use on plants grown for sale or commercial use, research, or commercial seed production.
- For soil or foliar applications, do not apply by ground within 25 feet of lakes, reservoirs, rivers, permanent streams, marshes or natural ponds, estuaries and commercial fish farm ponds.
- Application is prohibited directly into sewers or drains, or to any area like a gutter where drainage to sewers, storm drains, water bodies, or aquatic habitat can occur. Do not allow the product to enter any drain during or after application.
- Do not spray the product into fish pools, ponds, streams, or lakes. Do not apply directly to sewers or storm drains, or to any area like a drain or gutter where drainage to sewers, storm drains, water bodies, or aquatic habitat can occur.



Tempo[®]

SC ULTRA

INSECTICIDE

ACTIVE INGREDIENT: β - Cyfluthrin,
Cyano(4-fluoro-3-phenoxyphenyl)methyl
3-(2,2-dichloroethenyl)-2,2-dimethyl-cyclopropanecarboxylate11.8%

OTHER INGREDIENTS:.....88.2%

TOTAL:100.0%

Contains 1 lb cyano(4-fluoro-3-phenoxyphenyl)methyl
3-(2,2-dichloroethenyl)-2,2-dimethylcyclopropanecarboxylate per gallon.

EPA Reg. No. 432-1363
EPA Est. No. 92564-TX-01

KEEP OUT OF REACH OF CHILDREN
CAUTION

See Panel for First Aid Instructions and Booklet
for Complete Precautionary Statements and
Directions for Use.

This pesticide is extremely toxic to fish and aquatic invertebrates. Remove from premises or tightly cover fish tanks and disconnect aerators when applying indoors where such containers are present. To protect the environment, do not allow pesticide to enter or run off into storm drains, drainage ditches, gutters or surface waters. Applying this product in calm weather when rain is not predicted for the next 24 hours will help to ensure that wind or rain does not blow or wash pesticide off the treatment area. Rinsing application equipment over the treated area will help avoid run off to water bodies or drainage systems.

Do not apply when weather conditions favor drift from treated areas. Drift and runoff from treated areas may be hazardous to aquatic organisms in neighboring areas. Apply this product only as specified on this label.

This pesticide is highly toxic to bees exposed to direct treatment or residues on crops or weeds. Do not apply this product or allow it to drift onto crops or weeds on which bees are actively foraging. Additional information may be obtained by consulting your Cooperative Extension Service.

PHYSICAL & CHEMICAL HAZARDS

Do not use water-based sprays of this product in conduits, motor housings, junction boxes, switch boxes, or other electrical equipment because of possible shock hazard.

PRODUCT FACTS

- Low Odor
- Non-staining
- No phytotoxicity on a wide range of ornamentals

- Could be toxic to bees

CBI - Proprietary information

Can be just as toxic or more than the active ingredient

They can be the solution, dust or granule that carries the active ingredient

They can be adjuvants, stickers, spreaders or other ingredients that make the product work better.



SO WHY ARE SOME
PESTICIDES MORE
TOXIC TO
POLLINATORS THAN
OTHERS?





FACTORS THAT CONTRIBUTE TO TOXICITY TO POLLINATORS

- Type of pesticide
 - What is it designed to kill?



Monterey Garden Insect Spray

Insect Control Product
Easy-To-Use • Liquid Concentrate
Producto Para el Control de Insectos
Fácil de Usar – Concentrado Líquido



For Use in Organic Gardening
Para Usarlo en la Jardinería Orgánica

Contains Spinosad
Contiene Espinosad

For control of foliage feeding worms (caterpillars), leafminers, thrips, fire ants and other listed pests in:

- Lawns • Outdoor Ornamentals
- Vegetables, Apples, Citrus and Stone Fruit



Tempo
SC ULTRA

INSECTICIDE

ACTIVE INGREDIENT: β - Cyfluthrin,
Cyano(4-fluoro-3-phenoxyphenyl)methyl
3-(2,2-dichloroethenyl)-2,2-dimethyl-cyclopropanecarboxylate11.8%
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TOTAL:100.0%
Contains 1 lb cyano(4-fluoro-3-phenoxyphenyl)methyl
3-(2,2-dichloroethenyl)-2,2-dimethylcyclopropanecarboxylate per gallon.

EPA Reg. No. 432-1363
EPA Est. No. 92564-TX-01

KEEP OUT OF REACH OF CHILDREN
CAUTION



INSECTICIDES

- Contact Insecticides
 - Acute toxicity
 - Chronic toxicity
- Systemic insecticides
 - Absorbed into the plant tissue

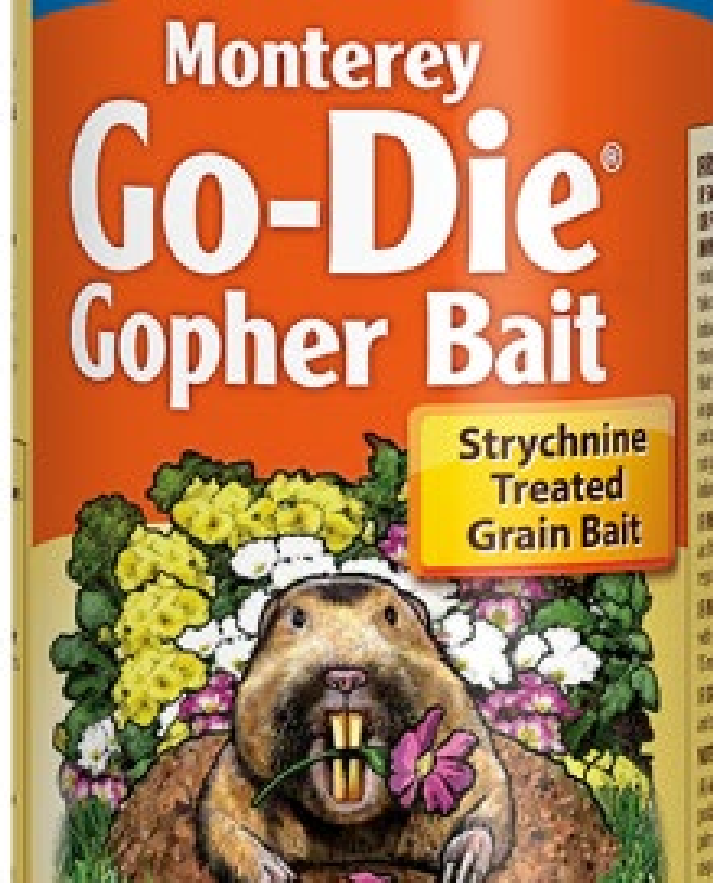
HERBICIDES

- Loss of habitat
 - Nesting
 - Foraging
 - Resources





FUNGICIDES



OTHER PESTICIDES (ACARICIDES, MOLLUSCICIDES, AVICIDES, RODENTICIDES, PISCICIDES, ALGICIDES, ETC.)

70% Neem Oil

Fungicide/Insecticide/Miticide

Controls Black Spot, Powdery Mildew, Rust, Needle Rust, Downy Mildew, Spider Mites, Aphids, Whiteflies, Twig and Tip Blight, Anthracnose, Scab, *Botrytis*, *Alternaria*, and Other Insect Pests

For Use on Roses, Flowers, Houseplants, Ornamental Trees and Shrubs, Fruits, Nuts and Vegetables

For Use In and Around the Home and Home Garden



Active Ingredient:	
Clarified Hydrophobic Extract of Neem Oil	70.0%
Other Ingredients:.....	30.0%
Total:	100.0%

EPA Reg. No. 70051-2-54705 EPA Est. No. 48498-CA-1

Net Contents: 8 FL OZ / 1 PINT / 16 FL OZ / 1 GAL

Manufactured for:
LAWN AND GARDEN PRODUCTS, INC.

pesticide off the treatment area. Rinsing application equipment over the treated area will help avoid run off to water bodies or drainage systems.

BEE HAZARD

This product is toxic to bees exposed to direct treatment. Do not apply this product while bees are actively visiting the treatment area.

DIRECTIONS FOR USE

IT IS A VIOLATION OF FEDERAL LAW TO USE THIS PRODUCT IN A MANNER INCONSISTENT WITH ITS LABELING.

Inert Ingredients

- Could be toxic to bees
- CBI - Proprietary information
 - Can be just as toxic or more than the active ingredient
 - They can be the solution, dust or granule that carries the active ingredient
 - They can be adjuvants, stickers, spreaders or other ingredients that make the product work better.

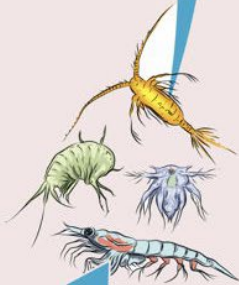
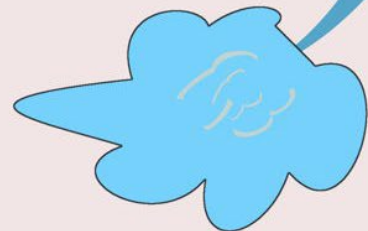
Fish-eating birds of prey
25 ppm

Large fish
2 ppm

Small fish
0.5 ppm

Zooplankton
0.04 ppm

Water
0.000003 ppm



FACTORS
THAT
CONTRIBUTE

PERSISTENCE

FACTORS THAT CONTRIBUTE FORMULATION



PESTICIDE FORMULATIONS: LIQUID



Pesticides in this formulation may be mixed with water. However, some may be used with crop oil, diesel fuel, kerosene, or some other light oil as carrier.

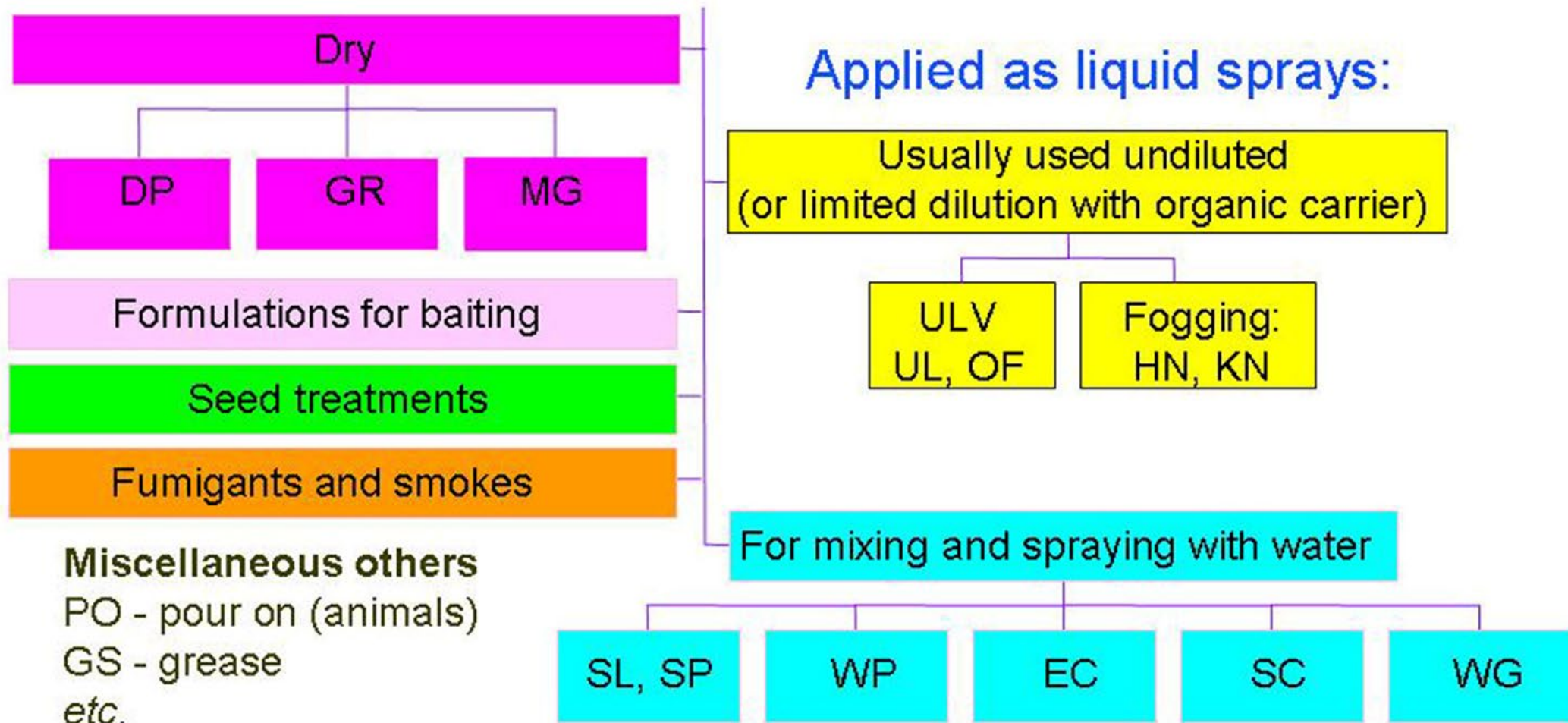
EMUSIFIABLE CONCENTRATES (EC or E)



An **emulsifiable concentrate** formulation contains an active ingredient in liquid form, one or more petroleum-based solvent (brings strong odor), and an **emulsifier** that allows the formulation to be mixed with water to form an emulsion.

FACTORS THAT CONTRIBUTE

Formulation types by use





MICRO-ENCAPSULATED ORGANOPHOSPHATES

PENNCAP-M (1974)



FACTORS THAT CONTRIBUTE

TIMING OF APPLICATION



FACTORS THAT CONTRIBUTE

APPLICATION AT BLOOM

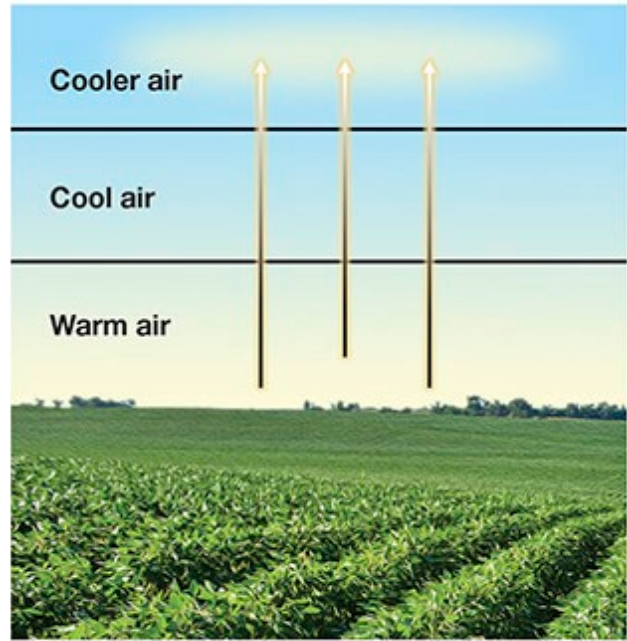


FACTORS THAT CONTRIBUTE

AIR TEMPERATURE



DO NOT ENTER
PESTICIDE APPLIED

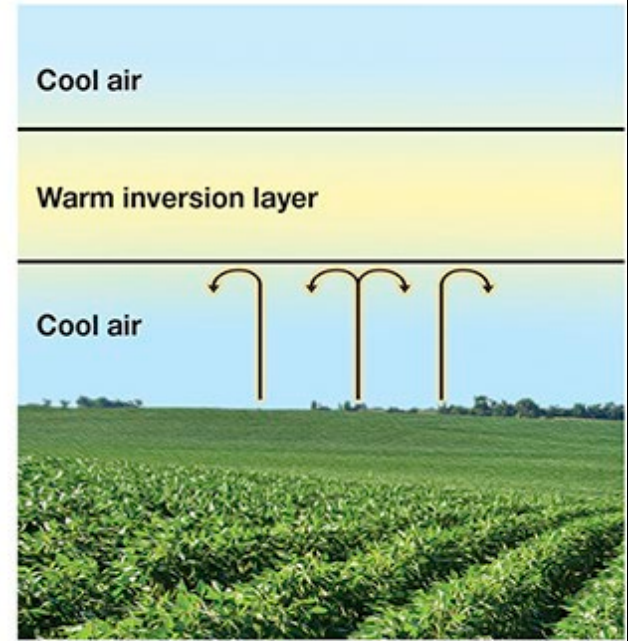


Cooler air

Cool air

Warm air

Normal Pattern

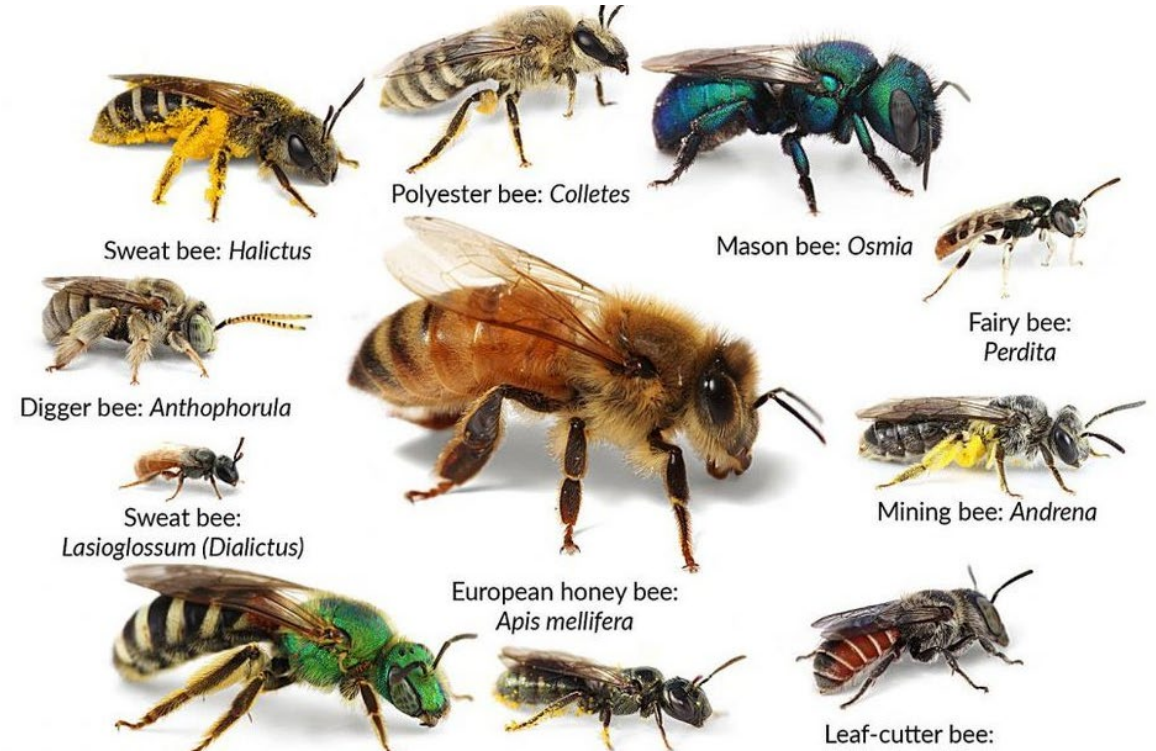


Cool air

Warm inversion layer

Cool air

Thermal Inversion



FACTORS THAT CONTRIBUTE - BODY SIZE

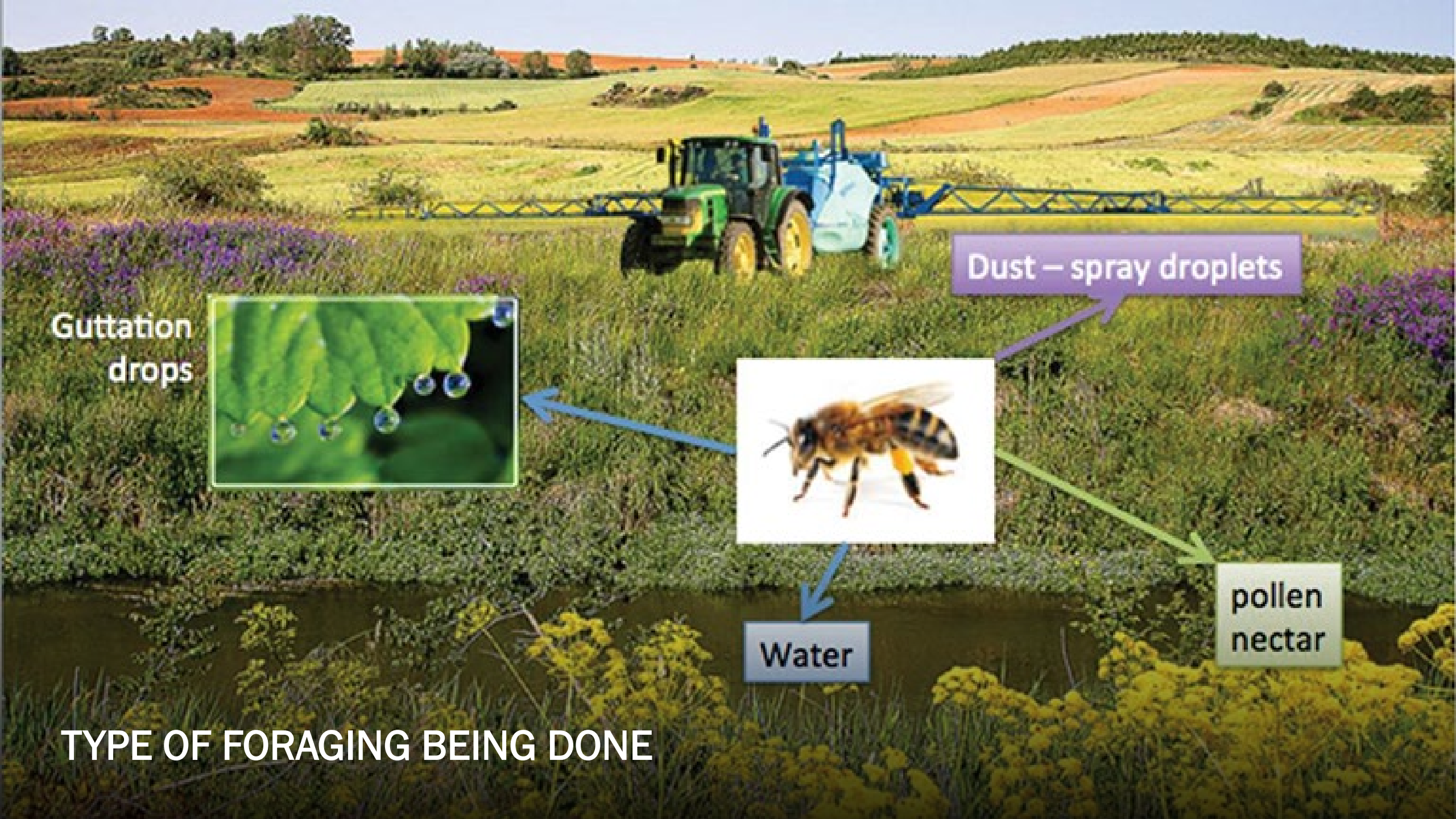
HONEY BEES SPECIFICALLY

(Apis mellifera)





HONEY BEES SPECIFICALLY



Guttation
drops



Dust – spray droplets



Water

pollen
nectar

TYPE OF FORAGING BEING DONE

HONEY BEES SPECIFICALLY

Strong Colony



Weak Colony



HONEY BEES SPECIFICALLY INSECTICIDES





A wide-angle photograph of a field of yellow Black-eyed Susans in the foreground. In the background, a road with several cars is visible, flanked by a dense forest of green trees. The sky is overcast with grey clouds. The word "HERBICIDES" is centered in white, serif, all-caps font, with a thin white horizontal line underneath it.

HERBICIDES



FUNGICIDES

REDUCING RISK

- Avoid spraying during full bloom
- Formulations – choose wisely
- Use least toxic, lowest residual product
- Notify beekeeper if you are in area
- Spray in the evening
- Leave a buffer
- Don't apply just prior to a heavy rain
- Contact nearby beekeepers or MDA apiary registry



READ AND
FOLLOW
LABEL
DIRECTIONS

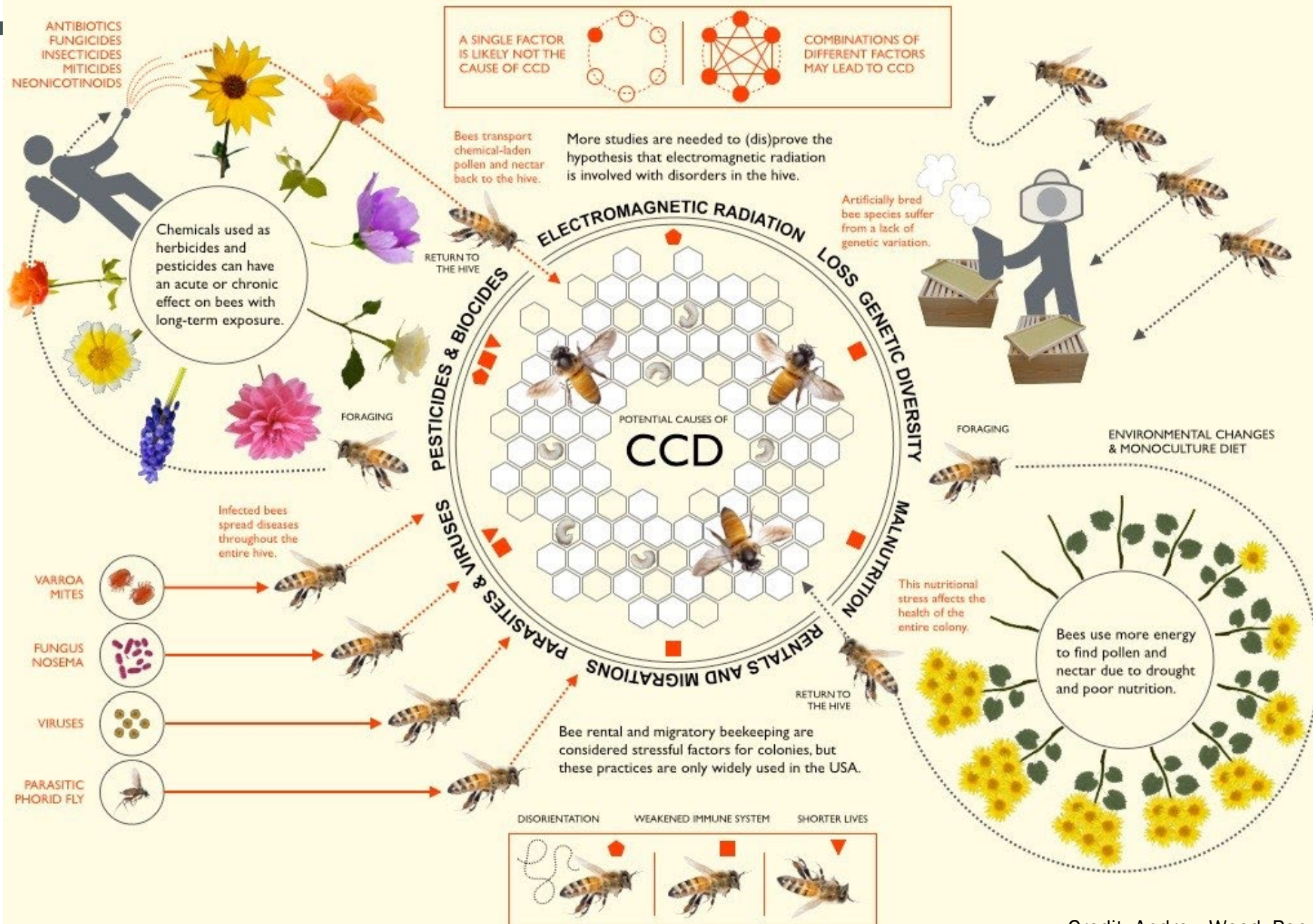


COLONY COLLAPSE DISORDER

- What is it??
 - Majority of workers leave hive and don't return leaving the queen and a few nurse bees to take care of the brood.
 - Plenty of honey stores
 - Very few dead bees
 - 2006-7



COLONY COLLAPSE DISORDER (CCD)





VARROA MITES





DEFORMED WING VIRUS

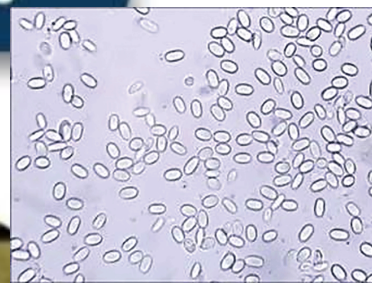


**BLACK QUEEN
CELL VIRUS**



SACBROOD VIRUS

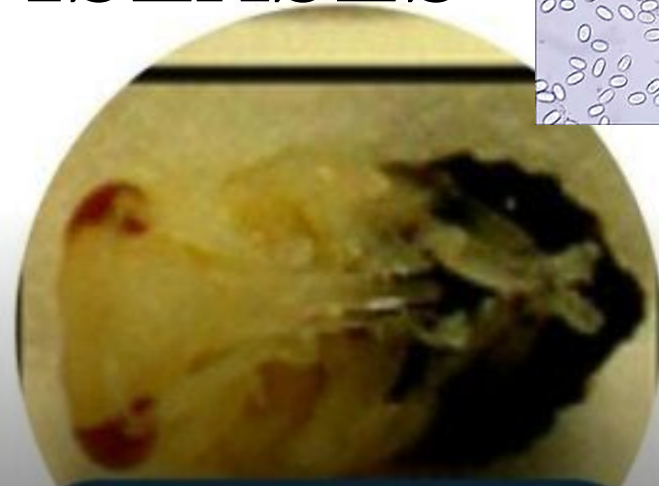
NEW OR EMERGING DISEASES



**CHRONIC BEE
PARALYSIS VIRUS**



**ACUTE BEE
PARALYSIS VIRUS**



**ISRAELI ACUTE
PARALYSIS VIRUS**

PESTICIDE POISONING

- Applications to crops
- Applications to hives for mite control





STRESS MANAGEMENT



HABITAT LOSS/CHANGE & FLORAL RESOURCES



A
COMBINATION
OF ALL THE
ABOVE

**MOST
LIKELY.**

QUESTIONS??

