



Pesticide Application Decisions To Protect Stormwater

SCVURPP

Landscape IPM Workshop

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Hazard vs Risk:

Hazard is the inherent danger in something

Risk is the probability of actual harm



Hazard vs Risk:

Hazard is the inherent danger in something

Risk is the probability of actual harm

Understand the difference to manage both!



Active Ingredient and Formulation

Water solubility

Soil mobility

Persistence in the environment



Active Ingredient and Formulation (cont'd)

Toxic to aquatic organisms



“This product is toxic to aquatic invertebrates.
Do not apply directly to water, or to areas
where surface water is present or...”

Active Ingredient and Formulation (cont'd)

Toxic to aquatic organisms

Solid formulations

Plant uptake

Application Method

Directed/shielded application and spot treatment,
including injection and drench

Solids vs liquids

Baits and bait stations



Product Category may not be Relevant!

DPR's Groundwater Protection List:

(<https://www.cdpr.ca.gov/docs/legbills/calcode/040101.htm>)

Chemical classes

- Organophosphates (“OPs”)
- Pyrethroids (Pyrethrin is **not** a pyrethroid!)
- Carbamates
- Fipronil
- Indoxacarb
- Diuron
- Diamides



Product Category may not be Relevant!

DPR's Groundwater Protection List:

(<https://www.cdpr.ca.gov/docs/legbills/calcode/040101.htm>)

Chemical classes

Avoid chemical classes known to be problematic



Regulatory Categories may be Helpful:

25b Exempt materials

“Organic” pesticides?

Biopesticides

Reduced-Risk pesticides



FIFRA 25b Exempt Materials:

Defined by EPA (based on 6 criteria)

Most are “commonly consumed food commodities, animal feed items, and edible fats and oils”

Consult List 25b (active ingredients) and 4a (inerts)



“Organic” Pesticides

Ain't no such!

Label Endorsements: OMRI-Listed, WSDA, USDA

“This product is toxic to aquatic invertebrates.

Do not apply directly to water, or to areas where surface water is present or...”



Biopesticides

Pollution prevention is a regulatory goal/standard!

Complicated regulatory structure

May be difficult to identify products/options



Biopesticide Categories:

Biochemicals

Microbials

Plant Incorporated Protectants



Biochemical Pesticides:

Naturally-occurring materials *or synthetic versions*

History of human/environmental exposure that demonstrates minimal toxicity

Non-toxic mode of action



Biopesticide Challenges:

“Biopesticide” is not going to be on the label!

Manufacturer positioning (and advertising?)

Consult the EPA’s list!



epa.gov/ingredients-used-pesticide-products/biopesticide-active-ingredients



All these materials
are biopesticides!!

(Z)-7-Dodecenyl Acetate: (80286-27 80286-28 80286-29
80286-30)

(Z)-8-Dodecen-1-ol

(Z)-8-Dodecen-1-yl acetate

(Z, E)-7, 11-Hexadecadien-1-yl Acetate

(Z, Z)-7, 11-Hexadecadien-1-yl Acetate

(Z,E)-9,12-Tetradecadien-1-yl acetate

(Z,Z) - 3,13 - Octadecadienol

(Z,Z)-11,13-Hexadecadienal

(Z,Z)-3,13-Octadecadien-1- yl acetate

(Z,Z)-7,11-Hexadecadienal

(Z,Z,E)-7,11,13-Hexadecatrienal

1,2,4-Trimethoxybenzene

1,2-Octanediol

1,4-Dimethylnaphthalene

Reduced-Risk Pesticides

“May...reduce the potential for contamination of groundwater, surface water, or other valued environmental resources.”

“Reduce the risks...to non-target organisms.”

Fairly complex regulations



Reduced-Risk Pesticides, Challenges & Tips

251 listed specific uses; ~80 are “OP Alternatives”

Show entries

Registrant ▲	Pesticide Type ⚡	Chemical ⚡	Site	Reduced Risk OP Alt
IR-4	H	Glyphosate	animal feed, non-grass group (exc. alfalfa); aloe vera; ambarella; artichoke, globe; bamboo shoots; betelnut; biriba; blimbe; borage, seed; buffalo gourd; chaya; crambe, seed; custard apple; dokudami; epazote; feijoa; flax; foliage of legume veg.; galangal root; ginger, white (flower); Governor's plum; gow kee leaves; grass, forage, fodder and hay group; herb and spices group; hops; ilama; imbe; imbu; jojoba (seed); juneberry; kava (root); kenaf; leafy veg.; leaves of root and tuber veg.; lesquerella (seed); leucaena; lingonberry; meadowform (seed); mioga (flower); mustard seed; okra; oregano, Mexican (leaves); palm heart; palm oil; papaya, Mountain papaya; pawpaw; pepper leaf; perilla (tops); pulasan; quinoa grain; root and tuber veg.; salal; sesame seed; Spanish lime; stevia (leaves); surinam cherry; teff, grain; ti leaves; wasabi (roots); water spinach (tops); watercress, upland; wax jambu; yacon tuber	RR
Monsanto	H	Glyphosate	glyphosate-tolerant corn, canola, sugar beet	RR



Reduced-Risk Pesticides, Challenges & Tips

251 listed specific uses; ~80 are “OP Alternatives”

Fairly few non-crop uses listed

Pyrethroids, fipronil, and indoxacarb are
all listed (mostly as OP Alternatives)



Examples from Product Labels

Sluggo and Ferroxx AQ

Fiesta Turf Weed Killer

Antixx Plus (2 labels)



Sluggo and Ferroxx AQ

Active ingredient: iron phosphate

A solid bait, intended to last 2+ weeks

Biodegrades completely



Fiesta Turf Weed Killer

Active ingredient: chelated iron (FeHEDTA)

A wholly new mode of action for selective
weed control in turf

10+ year track record in Canada



Antixx Plus (2 labels: PCO and Nursery)

Active ingredients: spinosad (a microbial insecticide) and iron phosphate

A solid bait, intended to last 2+ weeks

An alternative to, or rotation with fipronil, indoxacarb, pyrethroids



QUESTIONS?

Thanks for your time and attention!

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