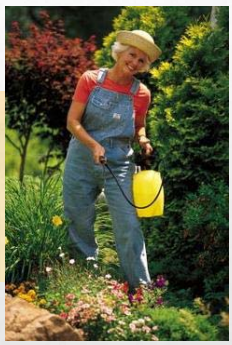
Herbicides



Pesticides and Human Health (from ~~RPIC~~)
Pesticides have a specific purpose in society.
Pesticides are intended to:
- Kill organisms that cause disease and threaten public health
- Control insects, fungus, and weeds that damage crops
- Control pests that damage homes and structures vital to public safety

Because people use pesticides to kill, prevent, repel, or in some way adversely affect some living organism (the pest), pesticides by their nature are toxic to some degree.

Even the least-toxic products, and those that are natural or organic, can cause health problems if someone is exposed to enough of it.

People come into contact with pesticides in many ways, including:
- When pesticides are used in and around our homes and gardens
- When pesticides are used on our pets
- When we work with pesticides
- When pesticides are used in our communities or in our environment
- When pesticides are used on the food we eat

The risk of health problems depends not only on how toxic the ingredients are (Pesticide Ingredients), but also on the amount of exposure to the product.

In addition, certain people like children, pregnant women and sick or aging populations may be more sensitive to the effects of pesticides than others.
To reduce the risk of health problems from pesticides there are several things you can do:
Identify the least-toxic way to control your pest;
learn about Integrated Pest Management (IPM).
Always read the pesticide label first!
Select the appropriate product for your site, method and goals.
Read all precautions and warnings on the label prior to use.
These are intended to help you prevent harmful exposures.
Take steps to minimize your exposure, even when using low toxicity pesticides

References

- UCIPM website- pest notes and PMG's
- National Pesticide Information Center http://npic.orst.edu

Do you need herbicides?

Herbicides are pesticides that control weeds

- Hand-weeding and mulching usually provide adequate control
- Use for special situations
- Figure out the underlying cause
- Use preventive methods
- Choose one labeled for the weed and safe around desirable plants

IPM for Weeds

Selecting the Best Herbicide

- **Identify the weed species to be controlled and life cycle**
- **What is the crop or desired plant?**
- **Determine the soil characteristics**
- **Environmental conditions**
- **Herbicide application equipment available**
- **Duration of weed control desired**
- **Is a pre- or postemergence herbicide best?**

Herbicides

Preemergence ⟷ Postemergence

Contact ⟷ Systemic

Selective ⟷ Non selective

Herbicides

Preemergence

Applied before weeds emerge

- Weed and Feed
- Weed Stopper® (surflan, oryzalin)
- Preen®
- Barricade® (prodiamine)
- Garden Weed Preventer® (dacthal)
- Roundup Extended Control®

Postemergence

Applied after weeds emerge

- Weed and Feed
- Grassgetter® (fluazifop)
- Roundup® (glyphosate)
- Trimec®, Turflon®,
- All organic herbicides

Herbicides

Contact

Causes localized plant injury where in contact with plant

- *All organic herbicides*
- Weed & Grass Killer® (diquat)
- Blackberry & brush block® (citric acid + acetic acid)

Systemic

Moves within plant, causes injury throughout

- Roundup® (glyphosate)
- Trimec® (2, 4-D, dicamba, MCPP)
- Weed B Gone
- Grass Getter
- Grass B Gone
- Roundup For Lawns®

Herbicides

Selective

Toxic only to certain plants

- Weed-B-Gon® (2,4-D) kills broadleaves, not grasses
- Grass-B-Gon® (fluazifop) kills grasses, not broadleaves
- Weed Stopper® (oryzalin) kills grasses and some broadleaves but does not injure established grasses and broadleaf plants

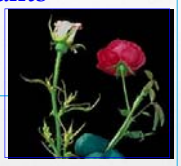
Non Selective

Generally toxic to all plants

- Finale®
- Roundup® (glyphosate)
- Grass Weed & Vegetation Killer®

Herbicides can injure garden plants

Preemergent
- Before seedlings emerge



Postemergent
- After weeds emerge

Selective
- Kills specific types of weeds

Nonselective
- Kills most vegetation

IPM for Weeds

Herbicides can injure garden plants

- When labels are not followed
- When drift occurs
- When roots are buried beneath treated areas

Special problem herbicides

Glyphosate Tryclopyr 2,4-D
Roundup Brush-b-gon Weed-b-gon

IPM for Weeds

Follow the label

- Follow all directions
- Use only the amount needed
- Don't overirrigate

Wear proper PPE

Make sure the product is labeled for your weed and is registered for the area where it will be used

IPM for Weeds

STATE OF CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY OFFICE OF ENVIRONMENTAL HEALTH HAZARD ASSESSMENT SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 CHEMICALS KNOWN TO THE STATE TO CAUSE CANCER OR REPRODUCTIVE TOXICITY July 7, 2017

The Safe Drinking Water and Toxic Enforcement Act of 1986 requires that the Governor revise and republish at least once per year the list of chemicals known to the State to cause cancer or reproductive toxicity. The identification number indicated in the following list is the Chemical Abstracts Service (CAS) Registry Number. No CAS number is given when several substances are presented as a single listing. The date refers to the initial appearance of the chemical on the list. For easy reference, chemicals which are shown underlined are newly added. Chemicals or endpoints shown in strikeout were placed on the Proposition 65 list on the date noted, and have subsequently been removed.

CHEMICAL	TYPE OF TOXICITY	CAS No.	Date Listed
Wood dust	cancer		December 18, 2009
Bracken fern	cancer		January 1, 1990
Diesel engine exhaust	cancer		October 1, 1990
Carbaryl	cancer	63-25-2	February 5, 2010
Leather dust	cancer		April 29, 2011
Glyphosate	cancer	1071-83-6	July 7, 2017
Salted fish, Chinese-style	cancer		April 29, 2011
~~Saccharin~~	cancer	81-07-2	October 1, 1989 Delisted April 6, 2001

Organic and Alternative Herbicides

Organic Herbicides

Good spray coverage is essential

70 GPA?- suppress lower 40?

Work best on clear sunny days.

Some work better in warm weather (80ºF+)

Organic surfactants improve weed control

Treat when weeds are small

Repeat applications are needed for larger weeds

Active Ingredients Which May Be in Minimum Risk Pesticide Products Exempted under section 25(b) of FIFRA

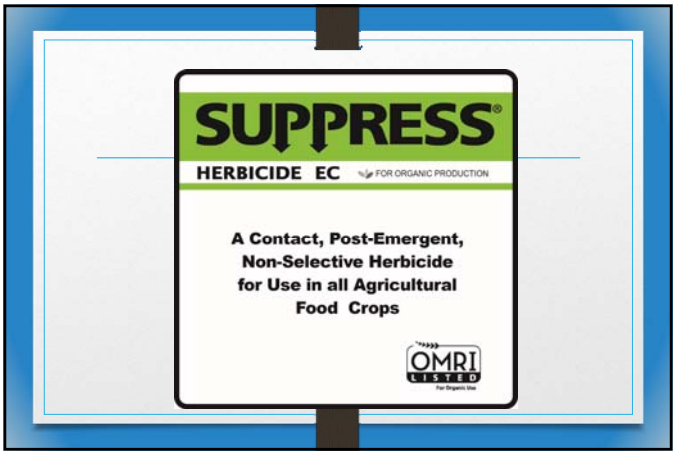
1. Castor Oil (U.S.P. or equivalent) 2. Cedar Oil
3. Cinnamon* and Cinnamon Oil * 4. Citric Acid*
5. Citronella and Citronella Oil 6. Cloves* and Clove Oil*
7. Corn Gluten Meal* 8. Corn Oil* 9. Cottonseed Oil*
10. Dried Blood' 11. Eugenol 12. Garlic* and Garlic Oil*
13. Geianiol14. Geranium Oil 15. Lamyl Sulfate
16. Lemon grass Oil* 17. Linseed Oil 18. Malic Acid*
19. Mint* and Mint Oil* 20. Peppermint* and Peppermint Oil*
21.2-PhenethylPropionate (2-phenylethyl propionate)
22. Potassium Sorbate 23. Putrescent Whole Egg Solids (See 180.1071)
24. Rosemary * and Rosemary Oil*
25. Sesame* (includes ground Sesame plant stalks) (See 180.1087) and Sesame Oil*
26. Sodium Chloride (common salt)* 27. Sodium Lauryl Sulfate
28. Soybean Oil 29. Thyme* and Thyme Oil* 30. White Pepper*
31. Zinc Metal Strips (consisting solely of zinc metal and impurities)

August 2016Cost/1000Ft^2

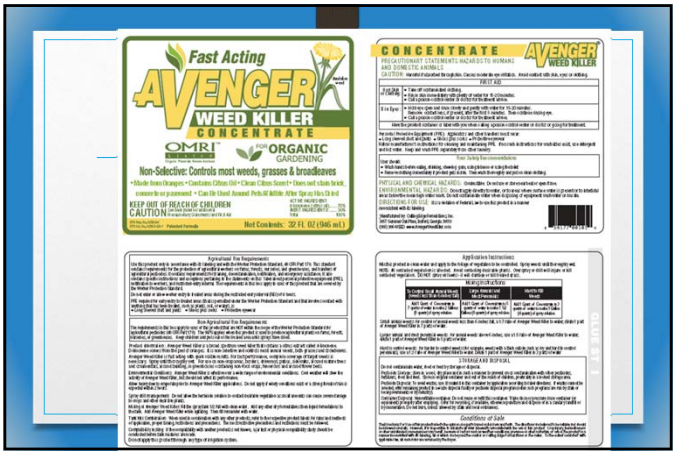
Product	Signal word	Active ingredient			Cost	Unit	
Roundup Pro	Caution	48.7% glyphosate			$69.99	2.5 gal	$0.87
Suppress	Warning	32% capric acid	47% caprylic acid		$150	2.5 gal	$7.49
Finale	Warning	11.33% glufosinate-ammonium			$175	2.5 gal	$2.17
WeedPharm	Danger	20% acetic acid			$29.95	gal	$7.80
AvengerAG	Caution	55% limonene			$157.26	2.5 gal	$18.53
AXXE	Warning	40% ammonium nonanoate			$195.02	2.5 gal	$4.84
WeedZap	25 (b)	45% clove oil	45% cinnamon oil		$124.35	gal	$12.84
Burnout II	Danger 25 (b)	8% clove oil	24% citric acid		$135.00	2.5 gal	$27.91
Scythe	Warning	3% nonanoic acid, other related	57% nonanoic acid		$178.98	2.5 gal	$7.39
Fiesta	Caution	26.52% iron hedta			$250.95	2.5 gal	$8.15
FinalSan*	Warning	22% free fatty acids and/or amine salts			$94	2.5 gal	$12.94

*w/surfactant is much better

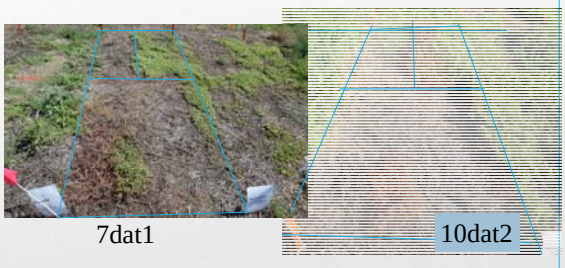

St. Gabriel
ORGANICS
BurnOut II
Fast Acting Weed & Grass Killer
CONCENTRATE
MADE FROM PLANT OILS
READY TO USE
DANGER
KEEP OUT OF REACH OF CHILDREN
WEEDZAP
A NON-SELECTIVE HERBICIDE FOR ANNUAL GRASSES AND WEEDS
JH Biotech Inc.


SUPPRESS
HERBICIDE EC
FOR ORGANIC PRODUCTION
A Contact, Post-Emergent,
Non-Selective Herbicide
for Use in all Agricultural
Food Crops
OMRI
LISTED


NATRIA
LAWN WEED CONTROL
Controls Broadleaf Weeds in Lawns
FIESTA
TURF WEED KILLER
ENGAGE AGRO


Fast Acting
AVENGER
WEED KILLER
CONCENTRATE
OMRI LISTED
ORGANIC GARDENING
Non-Selective: Controls most weeds, grasses & broadleaves
CAUTION
Net Contents: 32 FL OZ (946 mL)
AVENGER
WEED KILLER
CONCENTRATE

Finale



7dat1

10dat2

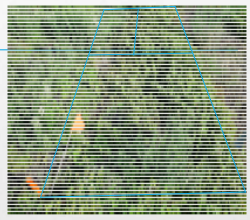
Scythe

7dat1

10dat2

Weedzap

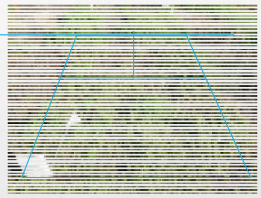
7dat1



10dat2

Avenger

7dat1



10dat2

Finalsan

7dat-1

10dat2

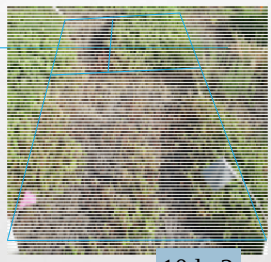
Suppress

7dat1

10dat2

WeedPharm

7dat1



10dat2

Results (% control)

45DAT 1st app, 35DAT 2nd app

	UNTREATED	ROUNDUP	ECOEXEMPT	MATRAN
1X	0	98.5	30.0	13.8
2X	0	98.5	30.0	15.0

	CIMONEX	ALL DOWN	BURNOUT II	WEEDZAP
1X	6.3	28.8	36.3	5.0
2X	6.3	38.8	51.3	5.0