WaterTox

Linking WIN-PST to Pest Management Guidelines

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Statewide IPM Program · University of California

Improved Guidelines

- **IPM resources are more grower friendly**
- **Year-round IPM**
  - Seasonal approach to what needs to be done and when
  - Integrated view of managing all the major pests of a crop
- **WaterTox to help growers meet Clean Water Act standards**
- **More reliable pest management for California growers**
  - New products
  - Pesticide resistance
  - Better treatment guidelines
  - More reliance on natural controls

Why?

- **Environmental issues**
  - NRCS, EQIP, and IPM
  - Water and air quality issues
  - Best Management Practices
- **Promote less-toxic pesticides and nonchemical approaches**
- **A more useful planning tool for growers and PCAs**
- **Web site offers comprehensive information, on demand**
  - Photo galleries, sampling forms, and pesticide database help mitigate water quality issues

Addressing Water Quality Issues

- **Cultural practices and nonchemical alternatives**
- **Monitoring guidelines and treatment thresholds to help farmers eliminate unnecessary pesticide use**
- **If pesticides are needed, guidelines help farmers to determine their risks to water quality from:**
  - Leaching
  - Solution runoff
  - Adsorbed runoff
- **Information about long-term fish and human toxicity**
- **Compare Pest Management Guideline pesticides**

WaterTox Data Source

- **WIN-PST: database from NRCS**
- **UC IPM's WaterTox database compares risk for all pesticides recommended in the Pest Management Guidelines based on:**
  - Risk of runoff and leaching on a high-risk soil
  - Long-term pesticide toxicity to humans and fish
  - Impact of management (application amount, method, rate), irrigation efficiency, probability of rainfall, and residue management

Select less-toxic materials to reduce long-term hazards to fish and humans

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UC IPM Online

STATEWIDE INTEGRATED PEST MANAGEMENT PROGRAM

UC IPM

Search

Announcing...

- Year-round programs: almond, cotton
- Cotton-planting forecast
- Grape powdery mildew risk index

Solve your pest management problems with UC's best information, personalize it with interactive tools, or find out about pest management research and extension projects.

- About UC IPM
- 2004 annual report NEW
- Our programs:
  - Cooperative Extension advisors
  - IPM education and publications
  - Pesticide safety education
  - Information systems
  - Research

How to manage pests

Manage and identify insects, mites, diseases, nematodes, weeds

landscapes, gardens, and turf

homes, structures, people, and pets

agriculture and floriculture *(Pest Management Guidelines)*

Use tools to help make decisions

weather data and products

degree-days

interactive tools and models

Educational resources

Publications and other materials

Workshops and events

Educational programs

Pesticide safety, training, and use

Research and IPM

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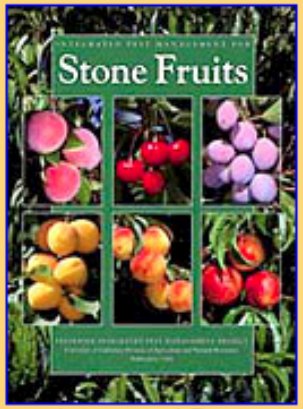
For more information, see this UC IPM book:



Integrated Pest Management for Stone Fruits

How to Manage Pests

Landscapes, gardens, & turf
Homes, people, & pets
Agriculture
Weather data & products
Degree-days
Interactive tools & models

Educational Resources

Publications & more
Workshops and events
PCA exam helper
Pesticide safety

How to Manage Pests

Peach

More crops

Year-Round IPM Program—tells you what you should be doing throughout the year in an overall IPM program. Includes Year-Round IPM Program Annual Checklist.

Year-Round IPM Program for Peach NEW

- Dormant/Delayed Dormant
- Bloom Season
- Fruit Development
- Harvest
- Postharvest

UC IPM Pest Management Guidelines—University of California's official guidelines for pest monitoring techniques, pesticides, and nonpesticide alternatives for managing pests in agriculture, floriculture, and commercial turf. More

| Authors/credits | Index to crops | PDFs to print | Recent updates |

General Information

- Dormant Shoot Sampling (3/06)
- Pheromone Traps (3/06)
- Early Season Monitoring (3/06)
- Shoot Strike Monitoring (3/06)
- Fruit Sampling (3/06)
- Relative Impact of the Timing of Pesticide Applications on Natural Enemies (3/06)
- Relative Toxicities of Insecticides and Miticides Used in Peaches to Natural Enemies and Honey Bees (3/06)
- General Properties of Fungicides Used in Peaches (3/06)
- Most Effective Treatment Timing for Key Diseases (3/06)

Insects and Mites

- Black Peach Aphid (3/06)
- Brown Mite (3/06)
- European Fruit Lecanium (3/06)
- European Red Mite (3/06)
- Fruittree Leafroller (3/06)
- Katydids (3/06)
- Obliquebanded Leafroller (3/06)
- Omnivorous Leafroller (3/06)
- Oriental Fruit Moth (3/06)
- Pacific Flatheaded Borer (3/06)
- Peach Silver Mite (3/06)
- Peach Twig Borer (3/06)
- Peachtree Borer (3/06)

Peach

Year-Round IPM Program

These practices are recommended for a monitoring-based IPM program that reduces water quality problems related to pesticide use. Links take you to information on how to monitor, forms to use, and management practices. Track your progress through the year with the annual checklist form (230KB, PDF).

Water quality becomes impaired when pesticides move offsite and into water. Each time a pesticide application is considered, review the Pesticide Application Checklist at the bottom of this page to learn how to minimize water quality problems. This program covers the major pests of peach; information on additional pests is included in the Peach Pest Management Guideline.

| Print annual IPM checklist (230KB, PDF) | Peach Pest Management Guidelines | Forms |

Dormant/Delayed-dormant season activities
Bloom season activities
Fruit development period activities
Harvest activities
Postharvest activities
Pesticide application checklist

Dormant/Delayed-dormant season activities (leaf fall to bud swell)

Why is this season important in an IPM program?
Special issues of concern related to water quality: dormant sprays, drift, and rain runoff.

What should you be doing during this period?

Prune trees, removing and destroying:
- Mummy fruit to reduce brow
- Shot hole-infested twigs

Apply fungicide treatments** a
- Shot hole
- Peach leaf curl

Manage orchard floor vegetatio
- Survey weeds and complet
- Manage weeds in rows with
- In tree middles, let resident

Take dormant shoot sample to
- Complete monitoring form
- Treat** if needed according

Bloom season activities (green tip to petal fall)

Why is this season important in an IPM program?
Special issues of concern related to water quality: runoff and drift.

What should you be doing during this period?

Put out pheromone traps for:
- Oriental fruit moth (February 15
- Omnivorous leafroller (San Joaq
- San Jose scale (February 25—S
- Check traps and keep records o

If using mating disruption for orienta

Fruit development period activities (petal fall

Why is this period important in an IPM program?
Special issues of concern related to water quality: runo

What should you be doing during this period?

Put up pheromone traps for:

**Pesticide application checklist

Before a pesticide application is made and when planning for possible applications in an IPM program, review and complete this checklist to minimize water quality and other problems.

- Follow each practice in the year-round IPM Program.
- Identify target pest, treatment threshold, trigger, or justification for treatment.
- Consider nonchemical alternatives.
- Identify important natural enemies that might be impacted by pesticide application.
- Choose a pesticide from the UC IPM Pest Management Guidelines for the target pest, considering impact on natural enemies and consulting the UC IPM Watertox Database for water quality concerns. Select an alternative chemical or nonchemical treatment when risk is high.
- Consider chemical class if pesticide resistance is an issue.
- Identify sensitive areas (for example, waterways or riparian areas) surrounding your application site.
- Identify practices or mitigation measures to be used to reduce pesticide movement off-site.
- Choose sprayers and application methods that minimize off-site movement.
- Review and follow pesticide handling, storage, and disposal guidelines.
- After an application is made, record application date, product used, rate, and location of application. Follow up to confirm that treatment was effective.

How to Manage Pests
UC Pest Management Guidelines

Peach
Dormant Shoot Sampling
(Reviewed 3/06, updated 3/06)

In this Guideline:

Dormant shoot sampling is used to determine the need for a dormant treatment for the control of San Jose scale, European fruit lecanium, and mite eggs (brown mite and European red mite).

HOW TO SAMPLE *(View photos for identification)*

- Take a sample between late November and mid-January.
- Randomly select 20 trees from each varietal block in the orchard.
- Choose 5 shoots randomly from the inside of each tree's canopy near the main scaffolds for a total of 100 shoots.
- Clip off a 3-inch section of the shoot that contains both 1- and 2-year old wood.
- Using a hand lens or binocular microscope, examine the section of the shoot and note the presence or absence of scales and parasitized scales and mite eggs on the dormant shoot sampling form (100KB, PDF). It is not necessary to count the number of individual insects or mite eggs present, just identify the pest and record whether it is present or not.
- Note if scales have been parasitized. A parasitized scale can be distinguished from a live scale by a small hole in the top of the scale covering. Parasitized European fruit lecanium scales turn black. If a large number of scales have been parasitized, minimize the use of insecticides during

Peach

Pests Monitored with the Dormant Shoot Sample

Each name links to more information on identification and management.

Click on photos to enlarge

San Jose scale nymphs (healthy)
Identification tip: The four round, dark scales in the center are the black cap stage, the most common overwintering form. The earlier white cap stage is to left.

San Jose scale (parasitized)
Identification tip: Scales parasitized the previous season will have a round hole in them where the adult parasite emerged.

European fruit lecanium nymphs (healthy)
Identification tip: Look for legless, immobile yellow insects on twigs. Older nymphs may have brown markings and a distinct center ridge.

European fruit lecanium scale (parasitized)
Identification tip: Parasitized lecanium scales, such as the one in the center here, turn black.

UC IPM
www.ipm.ucdavis.edu

Peach—Dormant Shoot Sampling
San Jose Scale (SJS), European Fruit Lecanium (EFL), and Mites

Supplement to UC IPM Pest Management Guidelines: Peach

Directions:
1. Clip off 5 shoots from each of 20 trees for a total of 100 shoots. Choose these shoots randomly from the inside of the tree canopies near the main scaffold. Clip off a 3-inch section of the shoot that contains both 1- and 2-year old wood.
2. Using a hand lens or microscope, examine the shoots and note the presence (+) or absence (-) of scales and parasitized scales, along with mite eggs. You don' need to count the individual insects or mite eggs, just identify the pest and record whether it is present. Compare the results to the treatment guidelines on page

Grower/Orchard_____ **Date**_____

Spur number	Spurs with SJS Live (+/-)	SJS Parasitized (+/-)	EFL Live (+/-)	EFL Parasitized (+/-)	Mite eggs (+/-)
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
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24					
25					
26					
27					
28					
29					
30					
31					

Spur number	Spurs with SJS Live (+/-)	SJS Parasitized (+/-)	EFL Live (+/-)	EFL Parasitized (+/-)	Mite eggs (+/-)
32					
33					
34					
35					
61					
62					

Dormant Treatment Decision Table

Pest	Treatment threshold (% infested spurs)		Treatment
San Jose scale	Harvested before June 15	Harvested after June 15	
	Below 20%	Below 5%	None
	20-60%	5-10%	Oil at 6 gal/acre
	Over 60%	Over 10%	Oil at 2-6 gal/acre plus insect growth regulator[1]
European fruit lecanium	24% and below		No spray
	Over 24%		Oil spray
Mites: overwintering eggs	Below 20%		No spray
	20% and over		Oil only

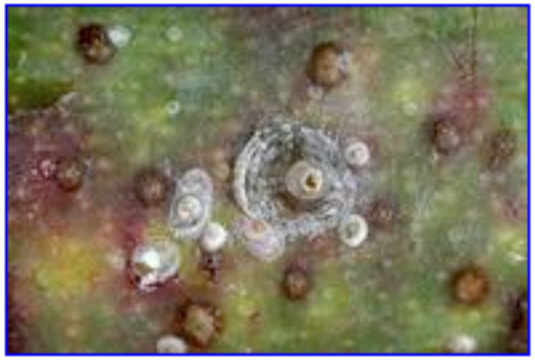
[1]Using oil at the 4-6 gal rate will help prevent development of resistance to the IGR. If oil is used at the 2 gal rate, do not use the IGR in consecutive years to prevent resistance development.

UC Pest Management Guidelines

Peach

San Jose Scale

Scientific name: ***Diaspidiotus (Quadraspidiotus) perniciosus***
(Reviewed 3/06, updated 3/06)



In this Guideline:

Water Quality Compare Treatments

The following materials are listed in order of usefulness in an IPM program, taking ir efficacy, impact on natural enemies and honey bees, and impact of the timing on ber When choosing a pesticide, also consider information relating to environmental imp

Note: If San Jose scale is a problem in the orchard, use a high-volume (dilute) application a or more per acre for best coverage.

DORMANT (Preferred timing)

A. NARROW RANGE OIL#
(Superior, Supreme) — 1.5 gal
MODE OF ACTION: Contact including smothering and barrier effects.
COMMENTS: Apply in a dilute application, using a total of 6–8 gallons of oil/acre. Prov 80% control; use for light to moderate infestations. Apply before late January when mo scales are in black cap stage. An option for orchards where bloom sprays of *Bacillus t* are planned for control of caterpillars and no broad-spectrum pesticides are used in the thus allowing beneficials to keep scale at low levels.

DESCRIPTION OF THE
Female San Jose scale
the adult scale covering.
suitable place to settle. In
plant and begin feeding ar
covering turns black (blac

San Jose scales overwint
adult females may also s
times before becoming ad
after the first molt when th
which yellowish, winged a
remains under its shell, w
mating, females produce
females begin hatching in
to five generations per ye

DAMAGE
San Jose scales cause in

Peach: San Jose Scale

Comparison among pesticides included in UC IPM Pest Management Guideline when applied under these general conditions:

See detail
- ○ Table
- ○ Data file

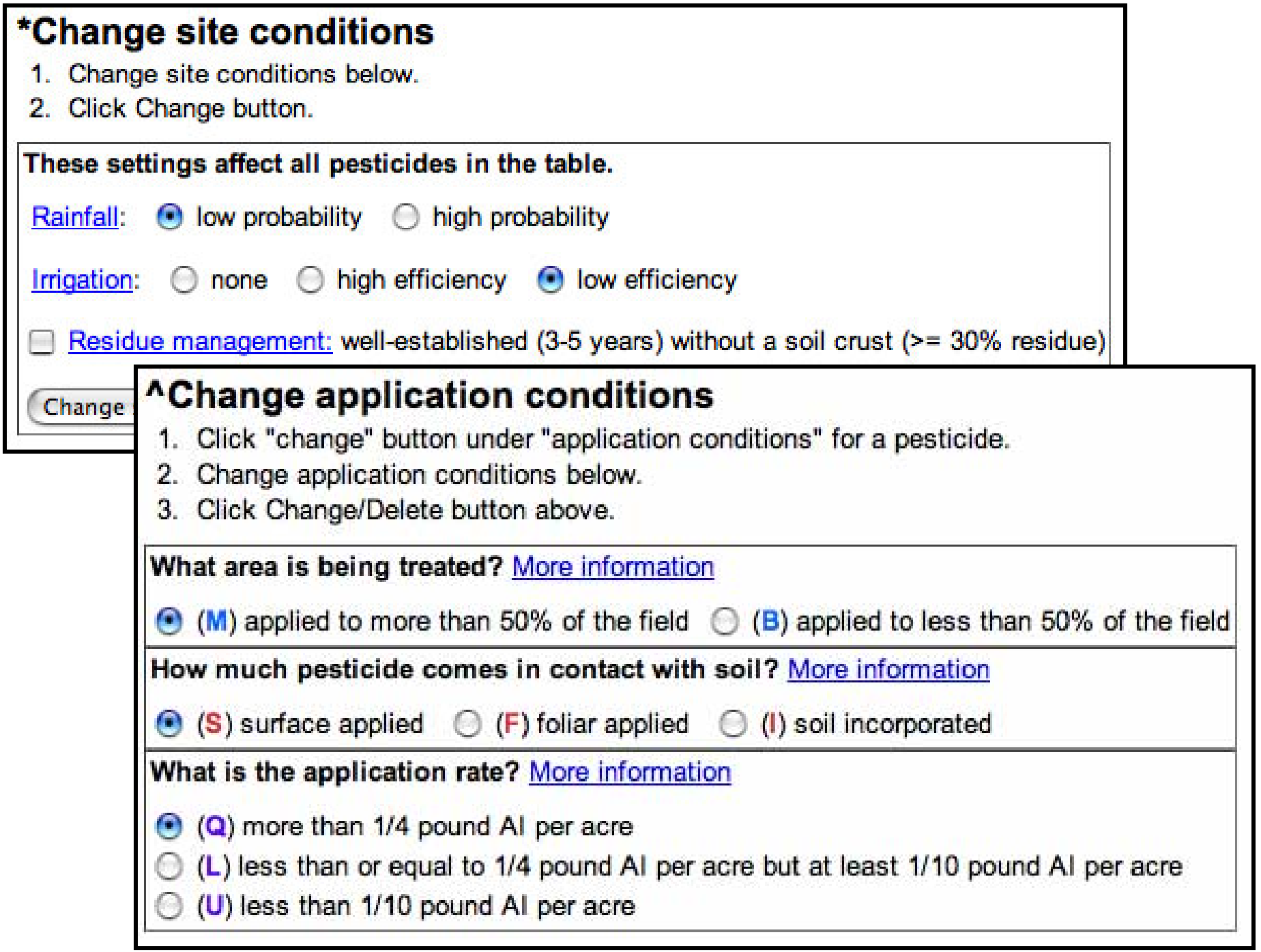
Report

Site conditions Change*
- soil highly susceptible to pesticide movement
- low probability of rainfall expected within 7-10 days of pesticide application
- low-efficiency irrigation expected within 7-10 days of pesticide application
- no residue management

Application conditions
- application to more than 50% of the field (M)
- surface applied (S)
- application rate more than 1/4 pound AI per acre (Q)

⚠ **Application rate, method, and site conditions may not be typical for this crop.**
To change these conditions to match your own, see below.

Delete row	Active ingredient (AI) (Sample trade name)	Application conditions	Change^?	Potential Pesticide Hazard on High-Risk Soils					
				Fish (Long-term)			Human (Long-term)		
				Leaching	Adsorbed runoff	Solution runoff	Leaching	Solution runoff	pH
☐	**Buprofezin** (Centaur)	M-S-Q	○	I	L	I	H	H	n/a
☐	**Carbaryl** (Sevin)	M-S-Q	○	I	L	I	I	I	n/a
☐	**Diazinon**	M-S-Q	○	X	H	X	X	X	n/a
☐	**Narrow range oil** (Superior)	M-S-Q		no known risk**	no known risk**	no known risk**	no known risk**	no known risk**	no known risk**
☐	**Pyriproxyfen** (Esteem)	M-S-Q	○	I	L	H	V	V	n/a



*Change site conditions

1. Change site conditions below.
2. Click Change button.

These settings affect all pesticides in the table.

Rainfall: (•) low probability ( ) high probability

Irrigation: ( ) none ( ) high efficiency (•) low efficiency

[ ] Residue management: well-established (3-5 years) without a soil crust (>= 30% residue)

Change

^Change application conditions

1. Click "change" button under "application conditions" for a pesticide.
2. Change application conditions below.
3. Click Change/Delete button above.

What area is being treated? More information

(•) (M) applied to more than 50% of the field ( ) (B) applied to less than 50% of the field

How much pesticide comes in contact with soil? More information

(•) (S) surface applied ( ) (F) foliar applied ( ) (I) soil incorporated

What is the application rate? More information

(•) (Q) more than 1/4 pound AI per acre

( ) (L) less than or equal to 1/4 pound AI per acre but at least 1/10 pound AI per acre

( ) (U) less than 1/10 pound AI per acre

University of California Statewide Integrated Pest Managemen

About WIN-PST

PESTICIDE ACTIVE INGREDIENT RATING REPORT, BASED ON WIN-PST

Crop: Peach Pest: San Jose Scale UC IPM Pest Management Guideline: 602300711 (Report generat

Active Ingredient Common Name	pH	Solubility In Water	Soil Half-Life	KOC	Human Toxicity	Fish Toxicity MATC*	Fish Toxicity STV
		(ppm)	(days)	(mL/g)	(ppb)	(ppb)	
Buprofezin Sample product: Centaur PC_CODE: 275100		0.38200	38	3450	7 HA*	63	216885
Carbaryl Sample product: Sevin PC_CODE: 056801		120	10	300	15 CHCL*	27	8220
Diazinon PC_CODE: 057801		60	40	1000	0.6 HA	0.092	92
Narrow range oil (Not included in WIN-PST) Sample product: Superior							
Pyriproxyfen Sample product: Esteem PC_CODE: 129032		0.36700	10	16785	2450 HA*	5.3674	90093

X -- eXtra high
H -- High
I -- Intermediate
L -- Low
V -- Very low

Issues

- WaterTox
  - Soils
  - Acute hazard
  - Risk to *Daphnia*
- Pesticide selection
  - Air quality
  - Pesticide resistance
  - Impact on natural enemies

For more information, visit our Web site at www.ipm.ucdavis.edu