



# Urban and Agriculture Prioritization for DPR's Reevaluation of Pyrethroids

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On behalf of the PWG member companies:  
Bayer, DuPont, FMC, Pytech, Syngenta, Valent

# Outline of Presentation

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- Management Practices for Agricultural Uses – 2007 Studies
- Pathway Identification for Urban Uses
  - 2007 Studies
  - Design Considerations for Future Studies
- Conclusions

# Introduction

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- Pyrethroids have been found in surface water sediments in monitoring conducted during the past few years in both urban and agricultural streams.
- Pyrethroids bind strongly to sediments and therefore essentially are not present in the water phase.
- Management practices generally focus on preventing movement of treated soil or sediments to surface water.

# Agricultural Uses of Pyrethroids

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- The PWG and its member companies have worked for several years to understand and reduce pyrethroid movement to surface water sediments.
- Appropriate control measures have been identified and adopted for most pathways by which pyrethroids potentially enter surface water sediments.
  - Expansion is a function of feasibility and agronomic factors

# Agricultural Uses of Pyrethroids

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- Preventing sediments leaving fields in runoff water is of particular relevance for reducing pyrethroids in surface water sediments.
  - However, no data on the relative significance of the various pathways currently exist.
- The Coalition for Urban/Rural Environmental Stewardship (CURES) with industry funding.
  - Distributed brochures and conducted educational meetings to emphasize the importance of best management practices.

# Types of Runoff Events

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- Runoff of winter rain water following dormant spray applications to fruit and nut trees
  - Is not an issue for row crops because of degradation of pyrethroids before winter rains
- Discharge of sediment laden irrigation water
  - Practice sometimes used to minimize salt accumulation in the soil
  - Practice will carry off essentially all pesticides applied to the fields

# Runoff after Dormant Sprays

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- Potential management practices focus on removal of sediment from water since volumes of water are too large to retain, especially in sloping terrains
  - Grassed row middles for fruit and nut trees with vegetative buffer strips around fields
    - For best results grass should be growing (may require supplemental irrigation)
  - Settling systems (difficult with such large flows)

# Discharge of Irrigation Water

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- Potential management practices
  - Agricultural practices which minimize irrigation water (for example, micro-spray and drip irrigation systems).
  - Recycle systems which re-use irrigation runoff water (approach used by only a few growers)
  - Removal of sediments (only makes a significant difference for very high Koc compounds)
    - Settling ponds
    - Flocculation processes (addition of PAM)  
sometimes not suitable for initial irrigation

# Discharge of Irrigation Water

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- Potential management practices (continued)
  - Vegetative ditches
    - Probably not efficacious enough to be used by itself
    - If ditch is considered habitat then the problem remains.
  - Wildlife habitat (large settling pond) based on water from several growers

# PWG Path Forward-Agricultural Uses

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- Initiate studies in 2007 addressing irrigation drainage water.
- Address dormant applications in the future if supplemental management practices need to be added to the new dormant spray regulations.

The PWG recognizes that the best solution to reducing losses from either type of runoff event is likely to be a combination of approaches.

# PWG 2007 Studies-Irrigation Drainage Water

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- Work has begun on the following two projects:
  - Assessing the effectiveness of sediment basins
  - Exploring the feasibility of agricultural practices designed to eliminate or reduce discharge of irrigation water

# Sediment Basin Study

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- Objective: Test effectiveness of two management practices
  - Sediment basins alone
  - Sediment basins with PAM (polyacrylamide)
- Test system
  - Crop: processing tomatoes
  - Application: lambda-cyhalothrin at 0.02 lb ai/acre

# Sediment Basin Study

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## ○ Location

- 455 acre field divided into numerous blocks, 300 acres planted to processing tomatoes
- Highly erodible land with a 1-2 percent slope
- Soil types are Vernalis (94%) and Zacharias clay loams (6%)

# Experimental Site

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# Sediment Basin



# Outlet Drain

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# Sediment Basin Study

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## ○ Measurements

- Background soil analyses (prior to application)
- Application verification samples
- Irrigation water
- Pyrethroid analyses of inlet and outlet water
- Total suspended solids in inlet and outlet water

# Runoff Reduction Technologies

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- Objective: Facilitate adoption of runoff reduction technologies by developing and providing economic information
- Process
  - Survey organizations that provide technologies
  - Survey growers to understand barriers to implementation of these technologies
  - Develop economic information
  - Distribute information to growers through a variety of channels

# Runoff Reduction Technologies

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- Technologies included
  - Sediment basins with and without PAM
  - Drip and micro-spray irrigation systems
  - Recirculation systems
  
- This project is being conducted by CURES (Coalition for Urban/Rural Environmental Stewardship) with funding from the PWG

# Urban Uses of Pyrethroids

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- Currently the predominant pathways by which pyrethroid residues reach urban streams in California are not well defined.
- Mitigation measures cannot be effective unless the cause of the residues is understood.
  - If the primary source of residues is from one use pattern, then requiring mitigation measures for another use pattern will not significantly reduce residue levels

# PWG Plans-Urban Uses

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- The PWG has committed to CA DPR to follow an orderly process of pathway identification.
  - Information gathering including use data
  - Refinement of the conceptual model
  - Propose studies for studying off site movement
- A preliminary review indicates that use is relatively broad and that no specific use pattern can be eliminated based on lack of use.

# Potential Pathways-Urban Environment

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- Numerous potential pathways
  - Structural uses
  - Ant control applications to structures
  - Homeowner application to lawns
  - Professional managed turf
  - Vector control
  - Dumping of water from pet grooming uses
- There is no scientific consensus on which pathway is the most important

# PWG Path Forward-Urban Uses

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- Continue to follow the orderly process proposed to CA DPR.
- Obtain information on pyrethroid use and application practices in the various markets.
  - Company specific information
    - Cannot be shared directly with other companies (antitrust regulations)
  - RISE is conducting an industry wide survey keeping the data from the individual contributors secret

# PWG Path Forward-Urban Uses

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- In 2007, conduct land use investigations in two urban watersheds where data on pyrethroid sediment residues are available.
  - Watersheds are the subject of an ongoing PWG biomonitoring study.
  - Objective is to determine what uses are contributing to residues at these locations.
- In 2008, conduct pathway specific studies.
  - The specific pathways and the nature of the studies will be based on results from the 2007 investigations.

# 2007 Urban Creeks Investigation

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- Objective is to determine pyrethroid uses contributing to residues in the urban streams included in biomonitoring investigations.
- Locations (watersheds previously investigated by Don Weston and currently under study in PWG-sponsored research)
  - Kirker Creek
  - Pleasant Grove Creek

# 2007 Urban Creeks Investigation

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## ○ Components

- Identify land uses in the watersheds and sub-watersheds relative to the locations of storm water drains and outfalls and the sediment and bio-assessment sampling points.
- Combine information on land uses with use/sales information on individual pyrethroids to determine which use patterns are contributing to the residues

# 2008 Studies

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- The role of prospective versus monitoring studies will have to be considered carefully.
  - Prospective studies conducted with good practices may help in determining the expected residues from a specific use.
  - Monitoring may be necessary if the major sources of residues are from spills and poor application practices.

# Conclusions-Agricultural Uses

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- Important pathways for the potential movement of pyrethroids to surface water sediments as a result of agricultural uses have been relatively well defined and some management practices have been identified for reducing off site movement.
- The work of the PWG in 2007 on agricultural uses of pyrethroids will concentrate on reducing sediment transported in irrigation drainage water.

# Conclusions-Urban Uses

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- The importance of the various pathways for movement of pyrethroids to urban creeks is not well defined.
- The PWG will follow an orderly process for identifying important pathways, and when appropriate, will develop management practices and educational programs to reduce movement of pyrethroids from specific pathways.