



California Environmental Protection Agency
Department of Pesticide Regulation

Pesticide Air Monitoring Network

March 18, 2016

Pesticide Registration and Evaluation Committee

Email during meeting: precomments@cdpr.ca.gov

Possible changes to air monitoring network

- DPR has evaluated results, and received comments from stakeholders and discussed:
 - Possible changes to monitoring objectives
 - Possible changes to pesticides monitored
 - Possible changes to sampling frequency
 - Possible changes to communities monitored
 - Possible changes to criteria for selecting sites within communities
- Proposed changes are shown in orange underline

Background

- DPR and ARB routinely conduct pesticide air monitoring
- **Application-site monitoring:** monitoring in the immediate vicinity of an application for several days to estimate acute exposures
- **Ambient air monitoring:** monitoring several communities in a high-use region during a high-use season for a single pesticide to estimate subchronic exposures
- **Air monitoring network:** year-round monitoring of several communities with high use of multiple pesticides to estimate cumulative, subchronic, and chronic exposures

Summary of DPR air network, 2011-2014

- DPR collected one set of 24-hr samples each week for 32 pesticides in Ripon, Salinas, and Shafter
- DPR calculated 24-hour, 4-week, 1-year, and overall average concentrations
- DPR compared detected concentrations to health screening levels or regulatory target concentrations
- Highest concentrations for the four fumigants were 23% – 175% of screening levels or regulatory targets
- Highest chlorpyrifos and diazinon concentrations were 47% and 74% of screening levels, respectively
- Highest concentration for other non-fumigant pesticides was <2% of screening levels

Summary of ARB air network, 2011-2014

- ARB collected one 24-hr sample every 6 days for 1,3-D and methyl bromide, and seasonal monitoring for chloropicrin in Oxnard, Santa Maria, and south of Watsonville
- DPR calculated 24-hour, 4-week, 1-year, and overall average concentrations
- DPR compared detected concentrations to health screening levels or regulatory target concentrations
- Highest concentrations were 59 – 140% of health screening levels or regulatory targets **(including chloropicrin 4-week concentration that was 117% of screening level in 2015)**

Monitoring objectives

- Suggested change to “*design program to monitor most hazardous pesticides most likely to move offsite in the air*” was vague and is addressed with current objectives
- DPR proposes no changes to DPR’s or ARB’s objectives
 - DPR: Identify common pesticides in air and determine seasonal, annual, and multiple-year concentrations
 - DPR and ARB: Compare concentrations to subchronic and chronic health screening levels
 - DPR and ARB: Track trends in air concentrations over time
 - DPR: Estimate cumulative exposure to multiple pesticides with common modes of action
 - DPR and ARB: Attempt to correlate concentrations with use and weather patterns

Pesticide selection criteria

- Evaluated top 100 pesticides used, except inorganics, oils, antimicrobials
- Prioritized pesticides based on
 - **Use:** indicator of exposure, rated 0 – 4
 - **Volatility:** indicator of exposure, rated 1 – 4
 - **DPR risk assessment priority:** indicator of toxicity, rated 1 – 4
 - Total rating 2 – 12
 - Feasibility of including several pesticides in single method

Pesticides monitored

- Monitoring Method 1 (Multi-residue) includes 27 pesticides
- Monitoring Method 2 (VOC) includes 3 fumigants: 1,3-D; methyl bromide; carbon disulfide
- Monitoring Method 3 for chloropicrin
- Monitoring Method 4 for methyl isothiocyanate (MITC)

27 pesticides in multi-residue method

(includes 11 organophosphates in bold)

- **Acephate (Orthene)**
- **Bensulide (Prefar)**
- Chlorothalonil (Bravo)
- **Chlorpyrifos (Lorsban) + OA**
- Chlorthal-dimethyl (Dacthal)
- Cypermethrin
- **Diazinon + OA**
- Dicofol (Kelthane)
- **Dimethoate (Cygon) + OA**
- Diuron (Karmex)
- Endosulfan (Thiodan) + sulfate
- EPTC (Eptam)
- Iprodione (Rovral)
- **Malathion + OA**
- **Methidathion (Supracide)**
- **Naled as dichlorvos (DDVP)**
- Norflurazon (Solicam)
- Oryzalin (Surflan)
- **Oxydemeton-methyl (Metasystox)**
- Oxyfluorfen (Goal)
- Permethrin
- **Phosmet (Imidan)**
- Propargite (Omite)
- **S,S,S-tributyl phosphorotrithioate (DEF)**
- Simazine (Princep)
- S-metolachlor (Dual)
- Trifluralin (Treflan)

May add pesticides to multi-residue method

- UC Davis attempting to add
 - 2,4-D
 - Captan
 - Fenpyroximate (Fujimite)
 - Imazalil (Magnate)
 - Methomyl (Lannate)
 - Pendimethalin (Prowl)
- Identified by CDPH as “pesticides of public health concern” and not currently included in monitoring
- Other pesticides of interest cannot be added to multi-residue method

Possible changes to DPR and ARB sampling frequency

- Current sampling frequency
 - DPR collects one set of 24-hr samples one random day each week
 - ARB collects one 24-hr samples every 6 days for 1,3-D and methyl bromide; chloropicrin every 3 days during peak season
- Suggested revisions
 - More frequent sampling during peak use season
 - No sampling during low use season
 - Change ARB sampling to random day

Proposed changes to DPR and ARB sampling frequency

- DPR and ARB propose to change ARB sampling to a random day
- DPR proposes no other changes to sampling frequency
 - Minimal value with calculating subchronic exposure using average of 8-12 samples rather than current 4 samples
 - 1-year average concentrations cannot be calculated if no samples are collected for several weeks
 - Pesticides are detected during periods of low or no use
 - Ambient air monitoring for individual pesticides provides additional subchronic data

Proposed changes to community selection

- Communities currently selected based primarily on pesticide use of 32 monitored pesticides
- Only fumigants and organophosphates approach or exceed screening levels or regulatory targets
- DPR proposes to monitor for 32 pesticides, but base community selection on use of fumigants and organophosphates
- DPR proposes to adjust use based on wind speed

Proposed revised method to rate communities for pesticide use – step 1

- Select two sets of communities
 - One based on 2012-2014 use of 4 fumigants
 - One based on 2012-2014 use of 11 organophosphates
- Use in 3 zones (greater weight to community use)
 - Use within community (community zone)
 - Use within community and 1 mile of community (local zone)
 - Use within community and 5 miles of community (regional zone)
- Determine use density (lbs/sq mi) by pesticide, year, and zone (36 or 99 use values) for each community
- Rank from highest to lowest community (1 to 1267) for each use value; no quartile rating
- Each community assigned average ranking of 3 years, 3 zones and 4 or 11 pesticides

Proposed revised method to rate communities for pesticide use – step 2

- Group top ranked communities by regions
- Evaluate top fumigant regional groups and top organophosphate regional groups
- Determine average wind speed for each group
- Adjust pesticide use by dividing by average wind speed
 - Consistent with air dispersion modeling
- Revise rankings for top regional groups based on adjusted pesticide use

Alternative 1 to select communities for DPR monitoring

- Monitor one current community (Shafter) each year
 - Would exceed 1,3-D regulatory target if concentration continues
 - Highest organophosphate concentrations relative to screening levels
- Select one community from top fumigant regions
- Select one community from top organophosphate regions
- Monitor all 32 pesticides at all three sites

Alternative 2 to select communities for DPR monitoring

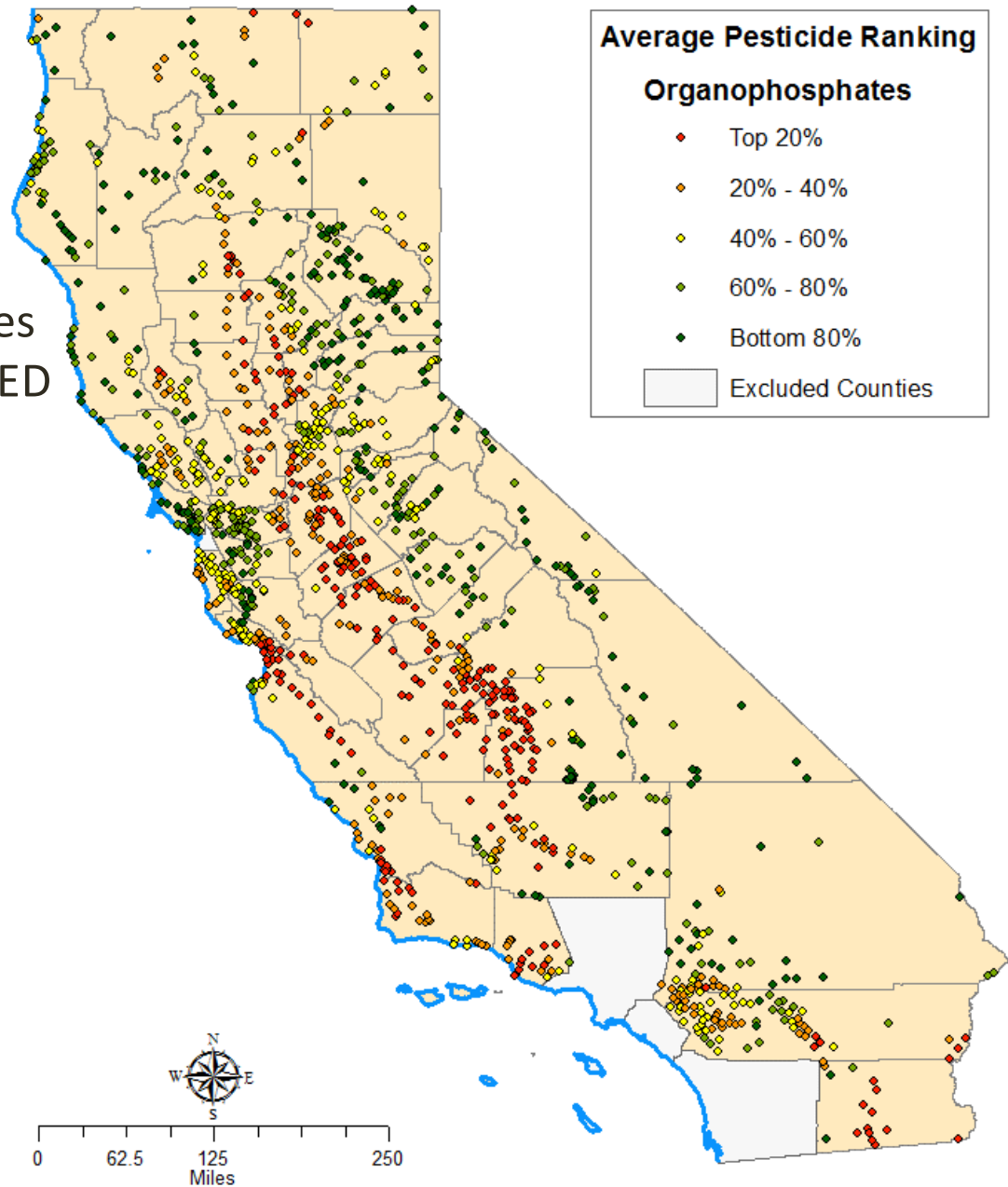
- Monitor one current community (Shafter) each year
- Select two communities from top fumigant regions
- Select two communities from top organophosphate regions
- Monitor Shafter, one fumigant community, and one organophosphate community in odd-numbered years
- Monitor Shafter and other two communities in even-numbered years
- Monitor all 32 pesticides at all five sites

Proposed selection of communities for ARB monitoring

- Monitor one current community (Santa Maria) each year
 - Exceeded chloropicrin screening level
 - Would exceed 1,3-D regulatory target if concentration continues
- Select one or two communities from the top 1,3-D and methyl bromide regions
- Monitor two or three communities

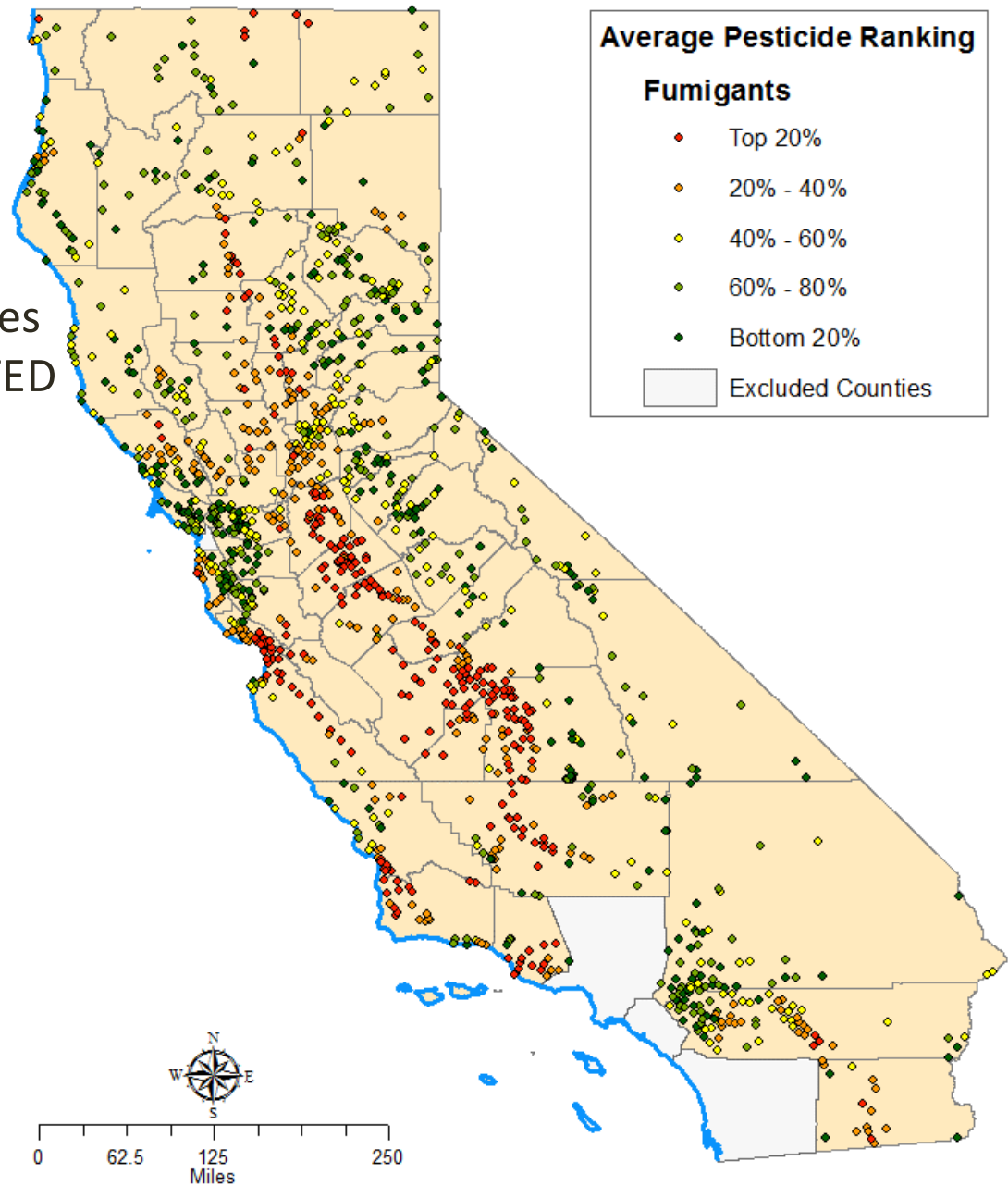
Organophosphate community rankings

- Ranks of 1267 communities for 2012-2014 UNADJUSTED organophosphate use
 - Within community
 - 1 mi of community
 - 5 mi of community



Fumigant community rankings

- Ranks of 1267 communities for 2012-2014 UNADJUSTED fumigant use
 - Within community
 - 1 mi of community
 - 5 mi of community



Communities with the highest UNADJUSTED use rankings for organophosphates (2012-14 data)

Communities	County	Ranking
Delft Colony, Tooleville, East Orosi	Tulare	1, 8, 9
Monterey Park Tract, Cowan	Stanislaus	2, 23
Mexican Colony, Cherokee Strip	Kern	3, 12
Chualar, Gonzalez	Monterey	4, 26
San Joaquin, Tranquility	Fresno	5, 6
Saticoy, El Rio	Ventura	7, 58
Westmorland, Palo Verde	Imperial	10, 41

Communities with the highest UNADJUSTED use rankings for fumigants (2012-14 data)

Communities	County	Ranking
Edmundson Acres, Mettler	Kern	1, 2
Macdoel, Mount Hebron	Siskiyou	3, 9
Saticoy, El Rio	Ventura	4, 10
La Vina, Bowles	Madera, Fresno	5, 22
Cuyama, New Cuyama	Santa Barbara	6, 12
Pajaro, Boronda, Castroville	Monterey	7, 11, 13
Delft Colony, Linnell Camp	Tulare	8, 40

Communities with the highest UNADJUSTED use rankings for 1,3-D and methyl bromide (2012-14)

Communities	County	Ranking
Macdoel, Mount Hebron, Dorris	Siskiyou	1, 6, 15
Edmundson Acres, Mettler	Kern	2, 5
Delft Colony, Rodriguez Camp	Tulare	3, 14
La Vina, Bowles, Biola	Madera, Fresno	4, 10, 19
Saticoy, El Rio	Ventura	7, 16
Pajaro, Boronda, Las Lomas, Castroville, Pajaro Dunes, Freedom	Monterey, Santa Cruz	8, 9, 11, 12, 13, 17
Bret Harte, Stevinson, Livingston	Stanislaus, Merced	18, 26, 32
Woodlands, Guadalupe	San Luis Obispo, Santa Barbara	20, 21
Parlier, Raisin City, Delhi	Fresno	30, 31, 33

Site selection within a community

- Minimum criteria
 - EPA ambient air siting criteria
 - 2 – 15 meters above ground
 - At least 1 meter horizontal and vertical distance from supporting structure
 - Should be at least 20 meters from trees
 - Distance from obstacles should be at least twice the obstacle height
 - Unobstructed air flow for 270°
 - Accessible to sampling personnel during time of sampling
 - Accessible to electrical outlets
 - Accessible to public
 - Secure from equipment loss or tampering
 - Permission of site operator/owner
- Preferred monitoring sites also meet the following criteria
 - School, day care center, or other “sensitive site”
 - Located on edge of community and/or adjacent to agricultural fields
 - Propose to add predominantly downwind from fields

Key issues

- Revise objectives?
- Revise pesticides monitored?
- Revise sampling plan, such as sampling frequency?
- **Continue monitoring Shafter and Santa Maria?**
- **Select communities based on 2012-2014 fumigant and organophosphate use, wind speed, and/or other factors?**
- **Weight use by distance?**
- Monitor more communities in alternating years or fewer communities each year?
- Revise criteria for selecting a site in a community to add predominantly downwind from ag fields, other changes?
- Should schools continue to be preferred sites?

Additional information and questions

- DPR web site
 - www.cdpr.ca.gov
 - “Air” tab
 - Click on “Air Monitoring Network”
- Contact
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