Department of Pesticide Regulation

Environmental Justice Pilot Project
Project Objectives, Pesticides, and Community for Monitoring

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Overview

As part of its Environmental Justice Action Plan, Cal/EPA is conducting six pilot projects that incorporate some of the themes in the Governor's Environmental Action Plan and focus on environmental risk factors that impact children's health. As part of this effort, the Department of Pesticide Regulation (DPR) will conduct an air monitoring project in the Fresno County community of Parlier. This document describes objectives and activities for the first phase, and provides background on how the community and pesticides were selected.

DPR's project, as well as the other Cal/EPA environmental justice pilot projects, will include additional elements to address definitions of and guidance for cumulative impacts, precautionary approaches, and public participation. These elements will be addressed as the project evolves. In addition, DPR's pilot project will include a strong public participation focus, with establishment of a local advisory group (LAG). The LAG will provide recommendations and input to the DPR staff involved in that pilot project. The LAG has

been selected to provide for a diversity of viewpoints and representation of community representatives, local agencies, the business community, and other local stakeholders

Project objectives:
The objectives define the scope of the project. These objectives may be refined after discussion with the LAG.:

- Are residents of the community exposed to pesticides in the air?
- Which pesticides are people exposed to and in what amounts?
- Do measured pesticide air levels exceed levels of concern to human health, particularly children?

Candidate pesticides to monitor:
DPR proposes to attempt to monitor for 21 to 27 pesticides. Candidate pesticides were selected based on the following criteria:

- Statewide use
- Volatility
- DPR risk assessment priority
- Valid monitoring method

Community selection:
DPR evaluated 83 communities, 81 of them in Merced, Madera, Fresno, Kings, and Tulare counties. In addition, one community each was evaluated in Kern and Stanislaus counties. These criteria were used to prioritize the communities:

- Community environmental justice factors
    - Child population (less than 18 years old)
    - Non-white population
    - Family income
    - Pesticide drift illnesses
- Availability of cumulative impact data
    - Pesticide well monitoring
    - Monitoring stations for criteria air pollutants
- Pesticide use
    - Regional use (within 5 miles of community) of four different categories of pesticides
    - Local use (within 1 mile of community) of four different categories of pesticides

DPR also considered other factors, including air sampling feasibility, weather patterns, and the potential for collaboration with other projects focused on environmental health.

Based on an extensive analysis of all these factors, DPR selected Parlier in Fresno County for monitoring.

Introduction

Cal/EPA's environmental justice strategy includes four overall goals:

1. Ensure meaningful public participation and promote community capacity-building to allow communities to effectively participate in environmental decision-making processes.
2. Integrate environmental justice into the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies.
3. Improve research and data collection to promote and address environmental justice related to the health and environment of communities of color and low-income populations.
4. Ensure effective cross-media coordination and accountability in addressing environmental justice issues.

As part of its Environmental Justice Action Plan, Cal/EPA is developing and conducting six pilot projects that incorporate these goals and some of the themes in the Governor's Environmental Action Plan, emphasizing environmental risk factors that impact children's health. DPR was asked to develop a pilot project in the Central Valley, focusing on pesticides in a rural, farming community.

Because they are located closer to agricultural fields, California rural communities may have higher concentrations of pesticides in ambient air compared to urban communities. Air monitoring conducted by DPR and ARB currently provides limited data to estimate human exposure to both single and multiple pesticides over several months or years.

This pilot project will provide more systematic air monitoring for a community in the Central Valley and therefore will serve as a more robust foundation for exposure assessment. DPR conducted a similar project in Lompoc (Santa Barbara County) and the U.S. Environmental Protection Agency is completing one in McFarland (Kern County). DPR will use similar methods for this study. For example, air sampling devices are typically placed on the roofs of public buildings (like schools), and analyses are done for a number of targeted pesticides. The study will include as many as 27 pesticides. Monitoring will likely occur at two to four sites in Parlier, sampled four to twelve times per month, for 6 to 12 months. As the first step in the planning process, DPR established the following project objectives, criteria for selecting pesticides, and criteria for selecting the community for monitoring.

Project Objectives

The objectives define the scope of the project and are consistent with the overall environmental justice goals. The goal in developing the objectives was to make them simple, measurable, attainable, realistic, and timely. DPR selected the following objectives, but may refine them after discussion with the LAG.

- Are residents of the community exposed to pesticides in the air?
- Which pesticides are people exposed to and in what amounts?
- Do measured pesticide air levels exceed levels of concern to human health, particularly children?

Pesticide Candidates for Monitoring

DPR selected candidate pesticides for monitoring based on potential health risk, with higher-risk pesticides having higher priority for monitoring. DPR selected higher-risk pesticides based on the following criteria:

- Statewide use
- Volatility
- DPR risk assessment priority*
- Valid monitoring method

** NOTE: Risk assessments have been completed on several of the target pesticides. However, each pesticide is at some point assigned a priority for risk assessment based on a number of factors, including health concern. The risk assessment priority ranking assigned to the pesticide was therefore incorporated as a factor in selecting pesticides to be targeted in this project.*

Pesticide health risk is a function of exposure and toxicity. Use and volatility are surrogates for exposure. Risk assessment priority is a surrogate for toxicity. Priority was also given to pesticides that can be monitored as part of a suite of chemicals (that is, pesticides for which a laboratory method exists that allows detection of multiple pesticides in a single analysis).

Table 1 (below) shows the top 100 pesticides used on agricultural sites in the state during 2002 which are potential candidates for monitoring. (2002 data was the most recent available when this analysis was done.) The 19 pesticides with scores of 10 or higher are considered high-priority candidates for monitoring.

Two of the nineteen pesticides (paraquat and maneb) cannot be monitored because no method to analyze them in air has been developed. (DPR and ARB efforts in this regard have not been successful to date.)

Several pesticides can only be monitored as single compounds. DPR has resources to use no more than two analytical methods in this project. The first should be a modification of the method DPR used for its Lompoc project, as it is a "screening" method that allows a single test to detect multiple chemicals (in this case, as many as 24 different pesticides). The other method should be a single-chemical method for another high priority pesticide, such as methyl isothiocyanate (MITC, a breakdown product of metam-sodium), or chloropicrin.

Some high-priority pesticides, in particular methyl bromide and 1,3-dichloropropene, cannot be analyzed with instruments available to DPR. The State Air Resources Board (ARB) conducted the previous ambient air monitoring for these pesticides as part of DPR's toxic air contaminant program. ARB has agreed to assist DPR in this project by monitoring for these pesticides.

The final selection of the pesticides for monitoring will be made in consultation with the LAG.

New monitoring methods will have to be developed for this project. While this pilot project will be in the San Joaquin Valley, in future years, air monitoring may be done in other areas of the state. Therefore, the laboratory is attempting to add several pesticides to the Lompoc method, including ones with that are little used in the San Joaquin Valley. If the laboratory

can develop a single procedure for a broad range of pesticides, DPR will be able to use a standard method in each new area monitored, achieving significant cost savings.

Community Candidates for Monitoring

DPR selected the community based on objective data, using criteria that can be quantified, validated, and verified. This provides a more transparent and fair selection process.

DPR evaluated 83 communities, 81 of them in Merced, Madera, Fresno, Kings, and Tulare counties. These five counties have high pesticide use (all are among the top 10 counties) and can be sampled by DPR's Fresno-based staff. In these five counties, DPR evaluated all communities included by name in the 2000 U.S. Census, except those communities in foothill areas. Several of these communities had been suggested by persons who commented on earlier drafts of this plan.

DPR also evaluated two communities suggested by commenters that are not in one of the five counties, Arvin (Kern County) and Grayson (Stanislaus County).

Commenters also made numerous suggestions for criteria to select the community. DPR developed its selection method based primarily on criteria suggested by one or more commenters. Each of the 83 communities were rated on the following categories and subcategories:

- Environmental justice factors
    - Population density of children (less than 18 years old)
    - Non-white population percentage
    - Median family income
    - Number of drift illnesses
- Availability of cumulative impact data
    - Monitoring density for pesticides in municipal wells
    - Monitoring stations for criteria air pollutants
- Pesticide use
    - Regional (within 5 miles of community) use density of organophosphates
    - Regional (within 5 miles of community) use density of fumigants
    - Regional (within 5 miles of community) use density of copper and sulfur
    - Regional (within 5 miles of community) use density of other pesticides
    - Local (within 1 mile of community) use density of organophosphates
    - Local (within 1 mile of community) use density of fumigants
    - Local (within 1 mile of community) use density of copper and sulfur
    - Local (within 1 mile of community) use density of other pesticides

Category Descriptions:

All subcategories were assigned a factor of 1 to 4 (a few subcategories were assigned rating factors from zero to 4). Four represented the highest priority for monitoring. For each subcategory, the 83 communities were divided into four groups. In most cases, the 20 communities with the highest values (or lowest values where appropriate) were rated four, the second 21 communities were rated three, and so forth. In most cases, the subcategory ratings are based on density per square mile rather than numerical totals. This minimizes the effect of the size of the community in the ratings. Without this adjustment, large

communities such as Fresno would show much greater child population and pesticide use in comparison to communities with small areas.

Child population density was determined from the 2000 Census and expressed as number of people less than 18 years old per square mile of the community. The 83 communities were divided into four groups and rated one to four, as described above.

Non-white population percentage was determined from the 2000 Census and expressed as the percentage of the community population. The 83 communities were divided into four groups and rated one to four, as described above.

Median family income was determined from the 2000 Census and expressed as the number of dollars per year. The 83 communities were divided approximately into four groups and rated one to four, as described above.

Drift illnesses were determined from DPR's Pesticide Illness Surveillance Program database for 1993 through 2002, and expressed as the number of non-occupational drift illnesses within the community. Only 11 of the 83 communities had illnesses documented in the database, so the normal groupings were not used. The four communities with 51 or more illnesses were rated four. No communities were rated three. The three communities with 13 to 16 illnesses were rated two. The four communities with two to seven illnesses were rated one. All other communities were rated zero. DPR considered expressing drift illnesses as a density or per capita basis, but this appeared to add an unnecessary level of complexity since only a few communities had illnesses and most were associated with small communities. DPR also considered using number of drift episodes, rather than number of illnesses as the criterion. However, very few communities had more than one episode, so this provided very little separation in ratings between communities.

Monitoring density for pesticides in municipal wells was determined from DPR's Well Inventory database for 1999 to 2004 and expressed as

$$\frac{\text{Number of municipal wells sampled x number of pesticides sampled}}{\text{Square miles of the community}}$$

Of the 83 communities, 28 had no municipal well monitoring data and were rated zero. The remaining communities were divided into groups with similar well monitoring densities. The 23 communities with the highest well monitoring density were rated four. The next 13 communities were rated three. The next seven were rated two. The next 12 were rated one.

Air monitoring stations were determined from ARB's and San Joaquin Valley Air Pollution Control District's (APCD) air monitoring network, and expressed as the number of criteria air pollutants monitored within the community. Of the 83 communities, 75 have no air monitoring stations. Three communities are monitored for five to six criteria air pollutants and were rated four. Two communities are monitored for three criteria air pollutants and were rated three. Three communities are monitored for one or two criteria air pollutants and were rated two. Those with no monitoring stations were rated zero.

All ***pesticide use*** was determined from DPR's 2002 pesticide use report database, and divided into eight subcategories. Use was compiled for two different area sizes and four types of pesticides. The two areas were regional and local use. ***Regional use density*** was expressed as pounds reported per square mile within five miles of the community boundary. ***Local use density*** was expressed as pounds reported per square mile within one mile of the community boundary.

Commenters were interested in specific types of pesticides. In addition, disparities in application rates (and therefore, in amount used per application) would give disproportionate weight to some pesticides if use were rated on total pounds of all pesticides. Therefore, pesticide use density was divided into four types:

- Organophosphates (14 pesticides in this subcategory);
- Fumigants (4 pesticides);
- Sulfur and copper (2 pesticides); and
- 13 other pesticides included in the Lompoc multi-pesticide method, or which DPR is attempting to add to the Lompoc method.

For each of the eight pesticide subcategories, the 83 communities were divided approximately into four groups, usually with the 20 communities with the highest pesticide use density rated four, the second 21 communities rated three, and so forth. A few communities had no use of some of the pesticide subcategories. These were rated zero.

How the community rating factors were weighted:
A rating for each of the three major categories (environmental justice, availability of cumulative impact data, and pesticide use) was determined by averaging the subcategory ratings. The three major category ratings were then added together for an overall community rating. This system gives equal weight to each of the three major categories.

Communities that are highly rated for monitoring:
Table 2 (below) shows the subcategory, category, and overall ratings for each community. The key to Table 2 gives a detailed description of the rating system. Appendix A contains charts showing a comparison of the 30 communities with the highest overall ratings for each of the 14 subcategories.

Based on this system, the following communities had the highest <u>overall ratings</u> (maximum rating of 12):

- Parlier (Fresno County), 10.0
- Arvin (Kern County), 8.4
- Visalia (Tulare County), 8.4
-

The following communities had the highest <u>environmental justice ratings</u> (maximum of 4):

- Earlimart (Tulare County), 4.0
- Arvin (Kern County), 3.5
-

The following communities had the highest <u>cumulative data availability ratings</u> (maximum of 4):

- Clovis (Fresno County), 3.5

- Parlier (Fresno County), 3.5
- Visalia (Tulare County), 3.5

The following communities had the highest pesticide use ratings (maximum of 4):
- Kingsburg (Fresno County), 3.9
- London (Tulare County), 3.8
- Huron (Fresno County), 3.6

Figure 1 shows the geographic locations of the highly rated communities listed above.

Air Sampling Considerations:
Several of these communities are currently monitored by ARB or the APCD for criteria air pollutants, or have been monitored previously for the toxic air contaminant program. In addition, DPR staff scouted most of the highly rated communities for monitoring sites. Monitoring sites must meet the following minimum criteria:
- The location of sample collection meets all U.S. EPA ambient air siting criteria
    - 2 to 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
- 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 the edge of the community and/or adjacent to agricultural fields
- Can be routinely sampled in four hours by DPR Fresno staff (minimizing travel time and costs and thus maximizing resources that can be directed to sampling and analysis)

The monitored community should have at least two sites that meet the minimum and preferred criteria listed above. DPR's preliminary observations show that the following highly rated communities do not meet all of these criteria:
- Arvin – cannot be sampled within four hours
- London – possibly one location that meets the preferred siting criteria

However, no site was eliminated from consideration because it could not meet the preferred criteria.

Weather Considerations:
Certain weather conditions are known to produce higher air concentrations, all other factors being equal. These conditions include low wind speed or calm conditions and persistent wind direction. DPR evaluated weather data from the State Department of Water Resources – California Irrigation Management Information System (CIMIS), for 1995 through 2004. Ratings were not determined for each community due to the overwhelming amount of

meteorological data. However, the highly rated community candidates can be divided into a few geographic areas. The historical weather data for the following areas were compared:

- Arvin
- Huron
- Mendota
- Parlier
- Visalia

Figures 2 and 3 show the wind speed and wind direction for each of these communities. Figure 2 shows that low wind speeds (less than 4.5 miles/hour or 2 meters/second) occur with greater frequency in Arvin, Parlier, and Visalia. Figure 3 shows that persistent wind direction occurs with greater frequency in Huron and Mendota. Since none of the communities had high frequency of both low wind speeds and persistent wind direction, air concentrations in these five areas would likely be comparable, all other factors being equal. In other words, weather conditions do not favor one community over another for this project.

Other Considerations:
Of the highly rated communities, the following ones may be less desirable for monitoring because they may not meet one or more of the overall environmental justice goals of the pilot project:

- Clovis – relatively low percentage of non-whites in population; relatively high income levels; relatively large population and area
- Kingsburg – relatively low percentage of non-whites in population; relatively high income levels
- Visalia – relatively low percentage of non-whites in population; relatively high income levels; relatively large population and area

Collaboration with other projects:
A number of communities under consideration offered benefits associated with collaboration with organizations planning complementary or related studies:

- The University of California, Davis, Agricultural Health and Safety Center plans a study of occupational and environmental health hazards in a migrant farmworker population, focusing on Mendota.
- The University of California, San Francisco, Valley Air Pollution Health Effects Research Institute in Fresno plans a study to evaluate correlations between asthma in children and air toxics, including pesticides. This study will examine asthma prevalence and air concentrations at two urban and two rural schools. The schools have not been selected, but they will likely be located in Fresno County.
- The California Environmental Health Tracking Program (joint program of the Centers for Disease Control and Prevention, California Department of Health Services, and Cal/EPA's Office of Environmental Health Hazard Assessment) is conducting a pilot project in the San Joaquin Valley to demonstrate the feasibility of linking exposure (including pesticides) and health outcomes data. This project will also evaluate potential relationships between exposure and health outcomes.

In this regard, Parlier and Mendota are more desirable for monitoring to take advantage of these collaborative projects.

Conclusions and Recommendations

Pesticides:
DPR selected pesticides for monitoring based on high statewide use, high volatility, high toxicity, and availability of monitoring methods. DPR likely has the resources to conduct monitoring using two methods. A modification of DPR's method used for the Lompoc project will be one of the methods used to analyze samples, as it will likely be able to analyze for most if not all of the following 21 pesticides (indicated by "DPR-Lompoc" or "DPR-Lompoc add" in Table 1): ***azinphos-methyl, chlorpyrifos, cypermethrin, diazinon, dicofol, dimethoate, diuron, endosulfan, EPTC, malathion, metolachlor, molinate, naled, oxyfluorfen, permethrin, propanil, propargite, SSS-tributyltriphosphorotrithioate (DEF), simazine, thiobencarb, and trifluralin***.

The other method will be a single-chemical method for another high-priority pesticide, such as ***MITC or chloropicrin***. With ARB assistance, the project will analyze for these pesticides as volatile organic compounds: carbon disulfide; 1,3-dichloropropene; and methyl bromide. ARB will also analyze for the following pesticides as metals/elements: chlorine, copper, and sulfur.

The pesticides included in the monitoring may be revised after discussion with the LAG.

Community:
DPR selected the community based on objective data. DPR has developed criteria that can be quantified, validated, and verified, providing a more transparent selection process. In addition, the analytical approach and information gathered will be useful in selecting communities for any future air monitoring projects.

DPR selected Parlier (Fresno County) for monitoring based on community environmental justice factors (child population, non-white population, income, drift illnesses); availability of cumulative impact data (well data, criteria air pollutant data); pesticide use (within one mile and five miles of the community); air sampling considerations; weather patterns; and possible collaboration with complementary studies.

Parlier has the highest overall rating (10.0) by a substantial margin. The next highest communities were Arvin and Visalia (8.4), Orange Cove (8.1), London (8.0), Cutler (7.8), and Reedley and Farmersville (7.6). Note that Parlier is 1.6 points higher than the next highest community, and 0.1 or 0.2 points separate most of the other communities. Alternatively, the 1.6 points separating Parlier and the two communities that ranked second is more than the 1.5 points separating the ratings of the next 20 communities (i.e., those ranked second through twenty-second).

In addition, Parlier is a candidate for UCSF's asthma study. Parlier also offers the potential of a collaborative relationship with the University of California Kearney Agricultural Center. The mission of the Kearney Center (located just outside Parlier) is to provide state-of-the-science research and educational programs to promote sustainability of California's agriculture industry and to enhance the quality of the rural environment. The possibility of consultation with the world-class scientists at Kearney would be beneficial not only during

the air monitoring portion but, even more important, during any mitigation development phase of the project. From a monitoring standpoint, Parlier likely has several preferred monitoring sites. Parlier's only drawback is that no non-occupational drift episodes have been reported. Also, "other" pesticides have moderate rather than high use.

DPR considered two other highly rated communities for monitoring: Arvin and Mendota. Arvin had the second highest overall rating (8.4). Arvin would be the preferred community if availability of cumulative impact data was not a factor, or if fumigant use was an overriding consideration. However, collection of cumulative impact data is one of the goals of all the environmental justice pilot projects being conducted by Cal/EPA. Furthermore, if this project was to focus on high fumigant use, the logical choice would have been a coastal farming community, as fumigant use is highest in the Central and Southern coastal areas of the state. A significant drawback for Arvin is that it is not a candidate for any of the collaborative health studies. Also, Arvin may only have one or two preferred monitoring sites. Its distance from Fresno (more than 130 miles) would mean that additional travel and per diem expenses would be incurred, resulting in fewer resources for sampling (10 to 30 percent fewer samples would be collected). Arvin's monitoring station for criteria air pollutants is located approximately three miles outside of the community.

Mendota has a lower overall rating (6.5, 25th highest) than Parlier and Arvin, as well as other communities, and normally would not be a leading candidate for monitoring. Mendota has little cumulative impact data available. Mendota has moderate use of most pesticides; none of the pesticide groups have high use. Mendota's advantage over other communities was the opportunity for collaboration with the UCD health study.

Tables 3 through 6 and Appendix B (maps showing key features and pesticide use) provide detailed information used to develop the rankings for Parlier, Arvin, and Mendota. Table 5 shows that a variety of commodities (although in different combinations) are grown in the region surrounding the leading candidate communities. The Parlier area primarily has fruit and nut orchards, and grapes, with some vegetables and nurseries. The Arvin area has more varied crops, including grapes, vegetables, cotton, and orchards. The Mendota area has grapes, vegetables, and field crops. From 19 to 39 different crops within five miles of each community were treated with candidate pesticides. Table 6 shows reported pesticide use from 2001 through 2003 (2004 data is not yet available) and indicates recent use is consistent for most pesticides.

The other communities with high overall ratings (Visalia, London, Orange Cove, Cutler, Reedley) do not offer any advantages over Parlier, except some have higher use of "other" pesticides, but lower ratings in most other categories. Earlimart and Huron would be highly rated (along with Parlier and Arvin) if availability of cumulative impact data was not a criterion for community selection.

Table 1. Pesticide candidates for DPR's environmental justice pilot project. Each category is rated one to four, with four representing the higher priority for monitoring (see key following table). Total Rating represents the sum of the use rating, volatility rating, and risk assessment rating. Pesticides with a "DPR-Lompoc" or "DPR-Lompoc add" monitoring method will likely be included in the monitoring.

Pesticide	2002 Statewide Use Rank	2002 Statewide Use (lbs)	Volatility	DPR Risk Assessment Priority	Monitor Method	Use Rating	Volatility Rating	Risk Assess Rating	Total Rating	TAC	Prop 65
1,3-DICHLOROPROPENE	6	5,412,503	High	High	ARB-VOC	4	4	4	12	yes	yes
CHLOROPICRIN	8	4,339,662	High	High	DPR-single	4	4	4	12	no	no
METAM-SODIUM [MITC]	3	15,518,465	High	High	DPR-single	4	4	4	12	yes	yes/no
METHYL BROMIDE	4	6,594,515	High	High	ARB-VOC	4	4	4	12	yes	some
POTASS N-METHYLDITHIO CARBAMATE [MITC]	18	1,267,737	High	High	DPR-single	4	4	4	12	yes	no
CHLORPYRIFOS	16	1,446,547	Med	High	DPR-Lompoc	4	3	4	11	no	no
MOLINATE	22	881,605	Med	High	DPR-Lompoc add	4	3	4	11	no	no
PROPARGITE	21	977,039	Med	High	DPR-Lompoc add	4	3	4	11	no	yes
SULFURYL FLUORIDE	9	3,045,084	High	Med	ARB-single	4	4	3	11	no	no
2,4-D, DMA SALT	41	452,155	Med	High	DPR-single	3	3	4	10	yes	no
ACROLEIN	59	283,541	High	High	ARB-single	2	4	4	10	yes	no
CHLOROTHALONIL	32	630,275	Med	High	ARB-single	3	3	4	10	no	yes
DIAZINON	29	689,603	Med	High	DPR-Lompoc	3	3	4	10	no	no
DIURON	17	1,303,745	Med	Med	DPR-Lompoc	4	3	3	10	no	no
MALATHION	33	619,811	Med	High	DPR-Lompoc	3	3	4	10	no	no
MANEB	25	852,435	Low	High	Unsuccessful	4	2	4	10	no	yes
PARAQUAT DICHLORIDE	24	869,244	Low	High	Unsuccessful	4	2	4	10	no	no
PROPANIL	15	1,470,535	Low	High	DPR-Lompoc add	4	2	4	10	no	no
TRIFLURALIN	19	1,103,442	Med	Med	DPR-Lompoc	4	3	3	10	yes	no
ACEPHATE	61	258,955	Med	High	DPR-single	2	3	4	9	no	no
ALDICARB	65	244,786	Med	High	DPR-single	2	3	4	9	no	no
CAPTAN	47	394,104	Low	High	Unsuccessful	3	2	4	9	yes	yes
CARBARYL	62	256,030	Med	High	DPR-single	2	3	4	9	yes	no
DIMETHOATE	52	332,543	Med	High	DPR-Lompoc	2	3	4	9	no	no
IPRODIONE	64	251,521	Med	High		2	3	4	9	no	yes
MANCOZEB	46	396,344	Low	High	Unsuccessful	3	2	4	9	yes	yes
MCPA, DMA SALT	50	347,377	Med	Med	DPR-single	3	3	3	9	no	no
NALED	73	201,504	Med	High	DPR-Lompoc	2	3	4	9	no	yes/no
OXYFLUORFEN	44	425,817	Med	Med	DPR-Lompoc add	3	3	3	9	no	no
PERMETHRIN	48	385,403	Med	Med	DPR-Lompoc	3	3	3	9	no	no
PHOSMET	45	405,088	Med	Med	DPR-single	3	3	3	9	no	no

Table 1 continued

Pesticide	2002 Statewide Use Rank	2002 Statewide Use (lbs)	Volatility	DPR Risk Assessment Priority	Monitor Method	Use Rating	Volatility Rating	Risk Assess Rating	Total Rating	TAC	Prop 65
S,S,S-TRIBUTYL PHOSPHOROTRITHIOATE	76	190,149	Med	High	DPR-Lompoc add	2	3	4	9	yes	no
SIMAZINE	31	634,888	Med	Med	DPR-Lompoc	3	3	3	9	no	no
ZIRAM	30	654,062	Low	High	Unsuccessful	3	2	4	9	no	no
AZINPHOS METHYL	88	153,200	Med	High	DPR-Lompoc add	1	3	4	8	no	no
BENSULIDE	74	196,249	Med	Med		2	3	3	8	no	no
CHLORINE	39	502,944	High		ARB-metal	3	4	1	8	no	no
CHLORTHAL-DIMETHYL	72	201,919	Med	Med	DPR-single	2	3	3	8	no	no
CYPERMETHRIN	55	302,983	Med	Med	DPR-Lompoc add	2	3	3	8	no	no
DICOFOL	79	182,464	Med	High	DPR-Lompoc	1	3	4	8	no	no
ENDOSULFAN	89	150,954	Med	High	DPR-Lompoc	1	3	4	8	no	no
ETHEPHON	38	538,553	Med	Low		3	3	2	8	no	no
GLYPHOSATE, IPA SALT	5	5,625,732	Low	Low		4	2	2	8	no	no
IMIDACLOPRID	70	224,730	Med	Med	DPR-single	2	3	3	8	no	no
METHOMYL	54	321,476	Med	Med	DPR-single	2	3	3	8	no	no
NITROGEN, LIQUIFIED	36	561,505	High			3	4	1	8	no	no
PENDIMETHALIN	42	447,032	Med	Low		3	3	2	8	no	no
PETROLEUM HYDROCARBONS	37	554,623	High			3	4	1	8	no	no
SODIUM HYPOCHLORITE	35	568,308	High			3	4	1	8	no	no
SODIUM TETRATHIO CARBONATE [CS2]	49	352,342	High		ARB-VOC	3	4	1	8	yes	yes
THIOBENCARB	27	844,565	Med	Low	DPR-Lompoc add	3	3	2	8	no	no
(S)-METOLACHLOR	57	299,992	Med	Low	DPR-Lompoc add	2	3	2	7	no	no
CALCIUM HYDROXIDE	13	1,861,117	Low			4	2	1	7	no	no
COPPER HYDROXIDE	11	2,592,460	Low		ARB-metal	4	2	1	7	no	no
COPPER SULFATE (BASIC)	23	876,722	Low		ARB-metal	4	2	1	7	no	no
COPPER SULFATE (PENTAHYDRATE)	10	2,916,477	Low		ARB-metal	4	2	1	7	no	no
CRYOLITE	20	1,101,802	Low			4	2	1	7	no	no
MINERAL OIL	7	5,044,900	Low			4	2	1	7	no	no
NORFLURAZON	78	188,032	Med	Med		1	3	3	7	no	no
ORYZALIN	81	179,886	Med	Med		1	3	3	7	no	no
PETROLEUM DISTILLATES	14	1,554,311	Low			4	2	1	7	no	no

Table 1 continued

Pesticide	2002 Statewide Use Rank	2002 Statewide Use (lbs)	Volatility	DPR Risk Assessment Priority	Monitor Method	Use Rating	Volatility Rating	Risk Assess Rating	Total Rating	TAC	Prop 65
PETROLEUM DISTILLATES, REFINED	60	276,457	High			2	4	1	7	no	no
PETROLEUM OIL, UNCLASSIFIED	2	17,673,122	Low			4	2	1	7	no	no
SODIUM CHLORATE	12	2,385,103	Low			4	2	1	7	no	no
SULFUR	1	53,614,583	Low		ARB-metal	4	2	1	7	no	no
SULFUR DIOXIDE	75	190,362	High		ARB-single	2	4	1	7	no	no
ALUMINUM PHOSPHIDE	84	165,230	High			1	4	1	6	yes	no
CARBON DIOXIDE	91	137,057	High			1	4	1	6	no	no
DISODIUM OCTABORATE TETRAHYDRATE	26	846,422	Low			3	2	1	6	no	no
EPTC	63	253,887	Med		DPR-Lompoc add	2	3	1	6	no	no
FOSETYL-AL	58	298,150	Low	Low	Unsuccessful	2	2	2	6	no	no
GLYPHOSATE-TRIMESIUM	90	147,402	Low	Med		1	2	3	6	no	no
HYDROGEN CYANAMIDE	77	188,376	High			1	4	1	6	no	no
LIME-SULFUR	28	761,536	Low			3	2	1	6	no	no
OLEIC ACID, METHYL ESTER	71	212,198	Med			2	3	1	6	no	no
PROMETRYN	82	176,882	Med	Low		1	3	2	6	no	no
UREA DIHYDROGEN SULFATE	34	589,897	Low			3	2	1	6	no	no
ALKYLARYL POLY(OXYETHYLENE) GLYCOL	40	501,085				3	1	1	5	no	no
ARSENIC PENTOXIDE	67	233,506	Low			2	2	1	5	yes	yes
CHROMIC ACID	53	326,645	Low			2	2	1	5	yes	no
COPPER OXIDE (OUS)	68	229,214	Low		ARB-metal	2	2	1	5	no	no
GLYPHOSATE	86	157,872	Low	Low		1	2	2	5	no	no
KAOLIN	43	438,548				3	1	1	5	no	no
MOLASSES	99	108,567	Low			1	3	1	5	no	no
PETROLEUM OIL, PARAFFIN BASED	51	343,916	Low			2	2	1	5	no	no

Key to Pesticide Candidate Ratings

Statewide Use (DPR Pesticide Use Report Database)

4 = 852,435 - 53,614,583 lbs during 2002 (top 25 pesticides)
3 = 347,377 - 846,422 lbs during 2002 (2nd 25 pesticides)
2 = 190,149 - 343,916 lbs during 2002 (3rd 25 pesticides)
1 = 108,518 - 188,376 lbs during 2002 (4th 25 pesticides)

Volatility (DPR Pesticide Chemistry Database)

4 = $>10^{-2}$ mm Hg (high)
3 = 10^{-6} - 10^{-2} mm Hg (medium)
2 = $<10^{-6}$ mm Hg (low)
1 = volatility unknown

DPR Risk Assessment Priority (SB950 – Birth Defect Prevention Act report)

4 = high priority
3 = medium priority
2 = low priority
1 = no priority assigned

Monitor Method

DPR-Single = DPR/CDFA has a validated method as a single analyte
DPR-Lompoc = Pesticide included in DPR's multi-chemical method for the Lompoc project
DPR-Lompoc add = CDFA attempting to add to the Lompoc method
ARB-VOC = Pesticide included in ARB's standard volatile organic compound method
ARB-Metal = Pesticide included in ARB's standard metal method
ARB-Single = ARB has a validated method as a single analyte
Unsuccessful = Previous attempts to develop a method were unsuccessful
Blanks indicate that neither DPR or ARB have attempted to monitor

TAC

yes = listed as a toxic air contaminant
no = not listed as a toxic air contaminant

Prop 65 - pesticides that cause cancer or reproductive effects

yes = listed under Proposition 65
no = not listed under Proposition 65
some = some uses listed under Proposition 65
yes/no = parent compound is listed, but the primary breakdown product is not, or vice versa

Table 2. Community candidates for DPR's environmental justice pilot project. Each category is rated one to four (with a few zeros), with four representing the higher priority for monitoring (see the following key for the values associated with each rating). Total Rating represents the sum of the average environmental justice community rating, average cumulative impact data rating, and average pesticide density rating.

Community	Child Population Rating	Non-white Population Rating	Income Rating	Drift Illness Rating	Avg EJ Community Rating	Well Monitoring Rating	Air Monitoring Rating	Avg Cumulative Impact Data Rating	Regional OP Rating	Regional Fumigant Rating	Regional Sulfur-Copper Rating	Regional Other Pesticide Rating	Local OP Rating	Local Fumigant Rating	Local Sulfur-Copper Rating	Local Other Pesticide Rating	Avg Pesticide Density Rating	Total Rating
Parlier	4	4	4	0	3.0	4	3	3.5	4	4	4	2	4	4	4	2	3.5	10.0
Visalia	3	1	1	4	2.3	3	4	3.5	3	3	2	3	3	3	2	2	2.6	8.4
Arvin	3	3	4	4	3.5	1	2	2.5	3	4	4	2	3	4	4	3	3.4	8.4
OrangeCove	4	4	4	0	3.0	4	0	2.0	4	3	2	4	4	1	3	4	3.1	8.1
London	3	2	4	0	2.3	4	0	2.0	4	4	3	3	4	4	4	4	3.8	8.0
Cutler	4	3	4	0	2.8	3	0	1.5	4	3	3	4	4	4	3	3	3.5	7.8
Reedley	4	2	1	2	2.3	4	0	2.0	4	4	3	3	4	4	3	2	3.4	7.6
Farmersville	4	3	3	0	2.5	4	0	2.0	4	3	2	4	4	4	2	2	3.1	7.6
Orosi	3	4	3	0	2.5	3	0	1.5	4	3	3	4	4	3	3	4	3.5	7.5
Sanger	4	2	2	0	2.0	4	0	2.0	4	3	4	3	4	3	4	3	3.5	7.5
Selma	4	3	2	0	2.3	4	0	2.0	4	4	4	2	3	3	4	2	3.3	7.5
Ivanhoe	3	3	3	0	2.3	4	0	2.0	4	2	2	4	4	3	2	4	3.1	7.4
Dinuba	4	2	2	1	2.3	3	0	1.5	4	4	3	4	4	4	3	2	3.5	7.3
Traver	1	2	4	0	1.8	4	0	2.0	4	3	3	4	4	4	3	3	3.5	7.3
Exeter	4	1	1	2	2.0	4	0	2.0	4	2	2	4	4	3	3	4	3.3	7.3
Calwa	3	4	3	0	2.5	4	0	2.0	2	4	4	1	2	4	4	1	2.8	7.3
Woodlake	3	3	4	0	2.5	4	0	2.0	3	2	1	4	3	3	2	4	2.8	7.3
Madera	3	2	3	2	2.5	2	3	2.5	2	2	4	2	1	1	4	2	2.3	7.3
Fresno	4	2	2	0	2.0	2	4	3.0	2	2	4	2	1	3	3	1	2.3	7.3
Kingsburg	3	1	1	0	1.3	4	0	2.0	4	4	4	3	4	4	4	4	3.9	7.1
Poplar	2	4	3	0	2.3	4	0	2.0	3	3	2	4	2	4	2	3	2.9	7.1
Lindsay	4	3	4	0	2.8	3	0	1.5	4	0	2	4	4	0	3	4	2.6	6.9
Huron	4	4	4	0	3.0	0	0	0.0	4	4	4	4	4	3	3	3	3.6	6.6
Strathmore	2	3	3	0	2.0	4	0	2.0	4	1	1	4	4	0	3	4	2.6	6.6
Earlimart	4	4	4	4	4.0	0	0	0.0	2	2	4	1	2	3	4	2	2.5	6.5
Mendota	4	4	4	0	3.0	2	0	1.0	3	3	3	3	3	0	2	3	2.5	6.5
Clovis	3	1	1	1	1.5	3	4	3.5	1	2	2	1	1	2	1	1	1.4	6.4
Del Rey	1	2	3	0	1.5	4	0	2.0	4	3	4	1	3	2	4	1	2.8	6.3
Fowler	2	3	1	0	1.5	4	0	2.0	3	4	4	1	2	3	4	1	2.8	6.3
Parksdale	2	4	3	0	2.3	4	0	2.0	1	2	4	2	1	0	4	2	2.0	6.3
Richgrove	4	4	4	0	3.0	0	0	0.0	4	1	4	4	4	0	4	4	3.1	6.1
Woodville	1	4	4	0	2.3	3	0	1.5	2	3	1	3	2	3	2	3	2.4	6.1
Merced	3	2	2	0	1.8	2	2	2.0	2	2	2	4	2	1	2	4	2.4	6.1
Easton	1	2	2	0	1.3	4	0	2.0	2	3	4	1	2	4	4	2	2.8	6.0
Parkwood	2	3	2	0	1.8	4	0	2.0	1	2	4	2	3	0	4	2	2.3	6.0
Bowles	1	3	1	0	1.3	4	0	2.0	2	3	4	1	2	3	4	2	2.6	5.9
Winton	3	3	3	0	2.3	3	0	1.5	1	4	2	1	1	4	2	1	2.0	5.8
Terra Bella	3	4	4	0	2.8	1	0	0.5	3	1	3	4	2	0	2	4	2.4	5.6

Community	Child Population Rating	Non-white Population Rating	Income Rating	Drift Illness Rating	Avg EJ Community Rating	Well Monitoring Rating	Air Monitoring Rating	Avg Cumulative Impact Data Rating	Regional OP Rating	Regional Fumigant Rating	Regional Sulfur-Copper Rating	Regional Other Pesticide Rating	Local OP Rating	Local Fumigant Rating	Local Sulfur-Copper Rating	Local Other Pesticide Rating	Avg Pesticide Density Rating	Total Rating
Planada	3	4	4	0	2.8	3	0	1.5	2	2	1	1	3	0	1	1	1.4	5.6
Ducor	2	4	3	0	2.3	2	0	1.0	3	1	4	4	1	0	1	4	2.3	5.5
Tulare	3	2	1	0	1.5	3	0	1.5	2	3	1	3	3	3	2	3	2.5	5.5
Firebaugh	2	3	2	0	1.8	3	0	1.5	1	2	2	3	3	0	3	4	2.3	5.5
Goshen	2	1	3	0	1.5	4	0	2.0	3	2	2	3	2	0	1	3	2.0	5.5
Livingston	3	3	2	0	2.0	2	0	1.0	1	4	3	1	1	4	3	1	2.3	5.3
Grayson	1	2	1	0	1.0	3	0	0.0	3	3	2	2	3	3	2	3	2.6	5.1
Cantua Cr	1	3	3	0	1.8	0	0	0.0	2	4	3	3	3	4	4	4	3.4	5.1
Kerman	4	3	2	0	2.3	0	0	0.0	2	4	4	2	2	3	4	2	2.9	5.1
Biola	2	4	3	0	2.3	0	0	0.0	1	3	4	3	1	3	4	3	2.8	5.0
Porterville	3	2	2	1	2.0	1	0	0.5	3	2	2	4	2	1	2	4	2.5	5.0
Raisin City	1	1	4	0	1.5	1	0	0.5	3	3	4	2	2	2	4	3	2.9	4.9
Avenal	1	3	3	4	2.8	0	0	0.0	1	4	2	1	1	4	2	1	2.0	4.8
San Joaquin	4	3	4	0	2.8	0	0	0.0	3	3	2	2	4	0	0	2	2.0	4.8
LemonCove	1	1	2	0	1.0	4	0	2.0	2	1	1	3	1	0	2	4	1.8	4.8
LemooreSta	2	1	3	0	1.5	0	0	0.0	4	4	2	3	3	3	3	3	3.1	4.6
Caruthers	2	2	1	0	1.3	1	0	0.5	3	3	4	3	3	0	4	2	2.8	4.5
Pixley	1	4	4	0	2.3	1	0	0.5	2	2	2	1	1	3	2	1	1.8	4.5
Corcoran	2	4	2	0	2.0	0	2	1.0	2	0	1	3	2	0	1	3	1.5	4.5
Delhi	2	2	1	0	1.3	1	0	0.5	2	4	3	1	2	4	3	2	2.6	4.4
Atwater	4	2	1	0	1.8	1	0	0.5	1	4	1	3	1	4	2	1	2.1	4.4
Madera Ac	2	1	1	0	1.0	3	0	1.5	2	2	4	2	1	0	3	1	1.9	4.4
Los Banos	3	1	1	0	1.3	3	0	1.5	1	2	1	3	1	0	2	3	1.6	4.4
Tranquillity	2	3	1	0	1.5	0	0	0.0	3	3	3	2	4	0	3	4	2.8	4.3
Laton	1	3	2	0	1.5	0	0	0.0	4	2	3	2	4	2	2	2	2.6	4.1
Lanare	1	4	3	0	2.0	0	0	0.0	3	2	3	3	2	0	1	3	2.1	4.1
Home Gard	3	3	4	0	2.5	0	0	0.0	3	1	1	3	1	0	1	3	1.6	4.1
KettlemanC	4	4	4	0	3.0	0	0	0.0	1	4	1	1	1	0	0	1	1.1	4.1
Tipton	2	4	3	0	2.3	2	0	1.0	1	0	1	2	1	0	1	1	0.9	4.1
S Dos Palos	1	2	4	0	1.8	0	0	0.0	1	1	2	4	3	0	3	4	2.3	4.0
Chowchilla	1	1	2	0	1.0	0	0	0.0	2	2	3	2	3	3	3	3	2.6	3.6
Le Grand	1	2	3	0	1.5	1	0	0.5	2	2	2	1	1	3	1	1	1.6	3.6
Dos Palos	3	1	2	0	1.5	0	0	0.0	1	1	3	4	2	0	2	3	2.0	3.5
Riverdale	1	2	3	0	1.5	0	0	0.0	3	1	3	2	2	0	2	3	2.0	3.5
Stratford	3	3	2	0	2.0	0	0	0.0	3	1	1	1	3	2	0	1	1.5	3.5
Hilmar	1	1	1	0	0.8	1	0	0.5	1	4	3	1	2	4	2	1	2.3	3.5
Hanford	3	1	1	1	1.5	0	0	0.0	3	1	1	3	3	0	1	3	1.9	3.4
Armona	2	1	2	0	1.3	0	0	0.0	3	1	1	2	3	2	1	1	1.8	3.0
Gustine	3	1	1	0	1.3	0	0	0.0	1	2	1	1	3	2	1	2	1.6	2.9
Lemoore	3	1	1	0	1.3	0	0	0.0	3	1	1	2	3	0	1	2	1.6	2.9
Alpaugh	1	2	4	0	1.8	0	0	0.0	1	0	1	3	2	0	0	2	1.1	2.9
Bonadelle	1	1	1	0	0.8	1	0	0.5	1	1	3	2	1	0	3	1	1.5	2.8
Coalinga	2	2	1	0	1.3	0	0	0.0	1	3	1	1	1	0	0	1	1.0	2.3
Friant	1	1	2	0	1.0	0	0	0.0	1	1	2	1	1	0	2	1	1.1	2.1

Key to Community Data

Environmental Justice Community Factors

Child Population Density (2000 Census)

4 = 1338 - 2969 children/mi2 (approx highest 20 communities)
3 = 788 - 1261 children/mi2 (approx 2nd 21 communities)
2 = 352 - 765 children/mi2 (approx 3rd 21 communities)
1 = 22 - 340 children/mi2 (approx lowest 21 communities)

Non-white Population Percentage (2000 Census)

4 = 65.5 - 91.1 percent (approx highest 20 communities)
3 = 52.8 - 65.0 percent (approx 2nd 21 communities)
2 = 42.1 - 52.4 percent (approx 3rd 21 communities)
1 = 6.9 - 41.5 percent (approx 21 lowest communities)

Median Family Income (2000 Census)

4 = 20,524 - 25,481 $/yr (approx lowest 20 communities)
3 = 26,166 - 32,470 $/yr (approx 2nd 21 communities)
2 = 32,852 - 37,033 $/yr (approx 3rd 21 communities)
1 = 37,979 - 86,653 $/yr (approx highest 21 communities)

Pesticide Illnesses (DPR Pesticide Illness Surveillance Program Database)

4 = 51 - 178 non-occupational drift illnesses during 1993 - 2002 (4 communities)
3 = no communities
2 = 13 - 16 non-occupational drift illnesses during 1993 - 2002 (3 communities)
1 = 2 - 7 non-occupational drift illnesses during 1993 - 2002 (4 communities)
0 = no non-occupational drift illnesses during 1993 - 2002 (72 communities)

Availability of Data for Cumulative Impact Evaluation

Municipal Well Monitoring Density (DPR Well Inventory Database)

4 = 28.3 - 1322 wells x pesticides sampled/mi2 during 1999 - 2004 (23 communities)
3 = 8.5 - 24.6 wells x pesticides sampled/mi2 during 1999 - 2004 (14 communities)
2 = 5.7 - 7.2 wells x pesticides sampled/mi2 during 1999 - 2004 (7 communities)
1 = 0.5 - 4.6 wells x pesticides sampled/mi2 during 1999 - 2004 (11 communities)
0 = 0 wells sampled during 1999 - 2004 (28 communities)

Air Monitoring Stations (ARB and APCD)

4 = monitored for 5 - 6 criteria pollutants (3 communities)
3 = monitored for 3 - 4 criteria pollutants (1 community)
2 = monitored for 1 - 2 criteria pollutants (4 communities)
0 = not monitored for criteria pollutants (75 communities)

Pesticide Use

Regional Organophosphate Use Density (DPR Pesticide Use Report Database)
Pounds/mi2 reported of 14 OPs within 5 miles of the community during 2002

4 = 274 - 796 lbs/mi2 (approx highest 20 communities)
3 = 157 - 247 lbs/mi2 (approx 2nd 21 communities)
2 = 93 - 155 lbs/mi2 (approx 3rd 21 communities)
1 = 9 - 88 lbs/mi2 (approx lowest 21 communities)

Regional Fumigant Use Density (DPR Pesticide Use Report Database)
Pounds/mi2 reported of 4 fumigants within 5 miles of the community during 2002

4 = 1,148 - 12,649 lbs/mi2 (approx highest 20 communities)
3 = 359 - 1073 lbs/mi2 (approx 2nd 21 communities)
2 = 74 - 342 lbs/mi2 (approx 3rd 21 communities)
1 = 2 - 70 lbs/mi2 (approx lowest 21 communities)
0 = no use

Regional Sulfur and Copper Use Density (DPR Pesticide Use Report Database)
Pounds/mi2 reported within 5 miles of the community during 2002

4 = 7927 - 22701 lbs/mi2 (approx highest 20 communities)
3 = 3109 - 6464 lbs/mi2 (approx 2nd 21 communities)
2 = 1467 - 2874 lbs/mi2 (approx 3rd 21 communities)
1 = 5 - 1377 lbs/mi2 (approx lowest 21 communities)

Regional Other Pesticide Use Density (DPR Pesticide Use Report Database)
Pounds/mi2 reported of 13 other pesticides within 5 miles of the community during 2002

4 = 354 - 566 lbs/mi2 (approx highest 20 communities)
3 = 241 - 331 lbs/mi2 (approx 2nd 21 communities)
2 = 156 - 234 lbs/mi2 (approx 3rd 21 communities)
1 = 3 - 147 lbs/mi2 (approx lowest 21 communities)

Local Organophosphate Use Density (DPR Pesticide Use Report Database)
Pounds/mi2 reported of 14 OPs within 1 mile of the community during 2002

4 = 288 - 1264 lbs/mi2 (approx highest 20 communities)
3 = 143 - 249 lbs/mi2 (approx 2nd 21 communities)
2 = 86 - 130 lbs/mi2 (approx 3rd 21 communities)
1 = 1 - 82 lbs/mi2 (approx lowest 21 communities)

Local Fumigant Use Density (DPR Pesticide Use Report Database)
Pounds/mi2 reported of 4 fumigants within 1 mile of the community during 2002

4 = 1,485 - 15,893 lbs/mi2 (approx highest 20 communities)
3 = 268 - 1,404 lbs/mi2 (approx 2nd 21 communities)
2 = 93 - 225 lbs/mi2 (approx 3rd 21 communities)
1 = 20 - 39 lbs/mi2 (approx lowest 21 communities)
0 = no use

Local Sulfur and Copper Use Density (DPR Pesticide Use Report Database)
Pounds/mi2 reported within 1 mile of the community during 2002

4 = 6,388 - 16,424 lbs/mi2 (approx highest 20 communities)
3 = 187 - 987 lbs/mi2 (approx 2nd lowest 21 communities)
2 = 93 - 143 lbs/mi2 (approx 3rd 21 communities)
1 = 10 - 616 lbs/mi2 (approx lowest 21 communities)
0 = no use

Local Other Pesticide Use Density (DPR Pesticide Use Report Database)
Pounds/mi2 reported of 13 other pesticides within 1 mile of the community during 2002

4 = 387 - 1123 lbs/mi2 (approx highest 20 communities)
3 = 220 - 351 lbs/mi2 (approx 2nd 21 communities)
2 = 132 - 214 lbs/mi2 (approx 3rd 21 communities)
1 = 3 - 126 lbs/mi2 (approx lowest 21 communities)

Table 3. Environmental justice factors, availability of cumulative impact data, number of monitoring sites, and other factors for the leading community candidates. Each community is rated one to four (a few with zero) for each category, with four representing the higher priority for monitoring.

Community Characteristic	Arvin	Mendota	Parlier
Area (mi^2)	4.8	1.9	1.6
Population	12,994	7,891	11,088
Population density (people/mi^2)	2,707	4,153	6,930
Environmental justice factors			
Child population density (children/mi^2)	1,082	1,382	2,618
Child population rating	3	4	4
Non-white population percentage	55.7	75.1	65.5
Non-white population rating	3	4	4
Median family income ($/yr)	24,816	22,984	24,275
Income rating	4	4	4
Number of non-occupation drift illnesses	178	0	0
Drift illness rating	4	0	0
Average environmental justice rating	3.5	3.0	3.0
Availability of cumulative impact data			
Number of municipal wells sampled	3	1	37
Well density (#wells x #pesticides/mi^2)	4.0	6.4	202.6
Well monitoring rating	1	2	4
Number of criteria pollutants monitored	2 (ozone, NO_2)	0	3 (ozone, CO, NO_2)
Air monitoring rating	2	0	3
Average cumulative impact data rating	1.5	1.0	3.5
Monitoring sites			
Likely number of preferred sites[a]	1 or 2	2 or 3	4 or 5
Able to collect maximum number of samples	No	Yes	Yes
Other factors			
Other air monitoring	None	None	Dioxin
Community environmental health study	No	Yes	Maybe

[a] Preferred monitoring sites are schools or other "sensitive sites" on the edge of town that meet U.S. EPA ambient air siting criteria.

Table 4a. Regional (within five miles of the community) use density (pounds per square mile) of candidate pesticides for the leading candidate communities, 2002. Each community is rated one to four (a few with zero) for each category, with four representing the higher priority for monitoring.

Type of Pesticide	Pesticide	Arvin	Mendota	Parlier
Fumigant	1,3-DICHLOROPROPENE	1,624.6	242.9	1,590.6
	CHLOROPICRIN	334.5	0.0	29.2
	METAM-SODIUM	10,525.1	583.3	172.8
	METHYL BROMIDE	165.0	0.0	103.8
Fumigant Total		12,649.2	826.2	1,896.4
Fumigant Rating		4	3	4
Organophosphate	AZINPHOS-METHYL	8.3	0.0	5.8
	CHLORPYRIFOS	68.5	57.6	182.5
	DIAZINON	0.0	33.6	28.1
	DIMETHOATE	26.1	1.1	5.7
	MALATHION	2.3	5.9	7.4
	METHIDATHION	5.0	0.0	0.0
	METHYL PARATHION	0.0	0.0	1.5
	NALED	1.0	43.8	0.0
	OXYDEMETON-METHYL	0.0	5.4	0.0
	PARATHION	0.0	1.0	0.0
	PHORATE	21.1	5.1	0.0
	PHOSMET	10.3	0.0	267.6
	SSS-TRIBUTYLPHOSPHOROTRITHIOATE	1.8	43.4	0.0
Organophosphate Total		144.3	196.8	498.7
Organophosphate Rating		3	3	4
Other	(S)-METOLACHLOR	1.9	42.5	0.0
	CARBARYL	10.6	2.3	15.5
	CYPERMETHRIN	0.0	0.3	0.0
	DICOFOL	2.3	55.2	4.2
	DIURON	35.3	49.8	16.2
	EPTC	64.1	6.5	0.0
	OXYFLUORFEN	24.6	15.5	34.3
	PERMETHRIN	3.7	1.3	0.0
	SIMAZINE	45.8	7.6	94.2
	TRIFLURALIN	39.5	104.4	1.6
Other Total		227.9	285.4	166.2
Other Rating		2	3	2
Sulfur-Copper	COPPER	323.4	18.3	785.2
	SULFUR	5,081.4	4,138.1	7,607.0
Sulfur-Copper Total		5,404.8	4,156.4	8,392.2
Sulfur-Copper Rating		4	3	4
Regional Pesticide Rating		3.3	3.0	3.5
Average (Regional and Local) Pesticide Rating		3.4	2.5	3.5

NOTE: These communities had no use of the following candidate pesticides: disulfoton, molinate, propanil, and thiobencarb.

Table 4b. Local (within one mile of the community) use density (pounds per square mile) of candidate pesticides for the leading candidate communities, 2002. Each community is rated one to four (a few with zero) for each category, with four representing the higher priority for monitoring.

Type of Pesticide	Pesticide	Arvin	Mendota	Parlier
Fumigant	1,3-DICHLOROPROPENE	2,100.9	0.0	834.9
	CHLOROPICRIN	211.3	0.0	76.5
	METAM-SODIUM	13,326.1	0.0	508.0
	METHYL BROMIDE	255.2	0.0	217.7
Fumigant Total		15,893.4	0.0	1,637.2
Fumigant Rating		4	0	4
Organophosphate	AZINPHOS-METHYL	27.3	0.0	0.4
	CHLORPYRIFOS	95.9	30.2	236.9
	DIAZINON	0.0	0.0	21.9
	DIMETHOATE	41.3	6.2	0.6
	MALATHION	2.5	10.9	3.1
	METHIDATHION	22.6	0.0	0.0
	NALED	1.9	60.5	0.0
	OXYDEMETON-METHYL	0.1	0.0	0.0
	PARATHION	0.0	6.2	0.0
	PHORATE	31.9	2.3	0.0
	PHOSMET	24.3	0.0	482.9
	SSS-TRIBUTYLPHOSPHOROTRITHIOATE	1.1	64.3	0.0
Organophosphate Total		248.9	180.6	745.8
Organophosphate Rating		3	3	4
Other	(S)-METOLACHLOR	0.0	33.3	0.0
	CARBARYL	18.2	12.7	28.7
	CYPERMETHRIN	0.0	1.3	0.0
	DICOFOL	0.3	58.1	1.4
	DIURON	26.3	31.0	9.9
	EPTC	89.8	0.0	0.0
	OXYFLUORFEN	55.5	24.0	54.2
	PERMETHRIN	3.8	0.0	0.0
	SIMAZINE	63.5	0.0	92.0
	TRIFLURALIN	63.5	81.4	1.9
Other Total		321.0	241.8	188.0
Other Rating		3	3	2
Sulfur-Copper	COPPER	447.6	14.0	1,081.9
	SULFUR	8,213.9	985.1	6,840.0
Sulfur-Copper Total		8,661.5	999.1	7,921.9
Sulfur-Copper Rating		4	2	4
Local Pesticide Rating		3.5	2.0	3.5
Average (Regional and Local) Pesticide Rating		3.4	2.5	3.5

NOTE: These communities had no use of the following candidate pesticides: disulfoton, molinate, propanil, and thiobencarb.

Table 5. Regional (within five miles) use density (pounds per square mile) of candidate pesticides by crop/site for the leading candidate communities, 2002

Crop/Site	Arvin	Mendota	Parlier
ALFALFA	16.61	130.48	0.44
ALMOND	17.82	3.67	21.85
APPLE	4.98	0.00	19.60
APRICOT	3.31	0.00	12.72
BEAN, DRIED	0.23	1.20	0.00
BEAN, SUCCULENT	5.23	0.00	0.29
BEET	1.39	0.00	0.00
BLUEBERRY	0.00	0.00	1.17
BROCCOLI	0.00	139.20	0.00
CABBAGE	0.01	0.00	0.00
CANTALOUPE	0.00	324.53	0.00
CARROT	5,362.48	0.00	0.00
CELERY	0.97	0.00	0.00
CHERRY	14.04	0.00	11.43
CHRISTMAS TREE	0.00	0.00	0.01
CITRUS	0.00	0.00	8.51
CORN (FORAGE - FODDER)	3.01	0.00	0.00
CORN, HUMAN CONSUMPTION	0.00	47.47	0.00
COTTON	387.87	201.59	0.00
EGGPLANT	0.00	0.00	10.37
FIG	0.00	0.00	0.00
GAI LON	0.02	0.00	0.00
GARLIC	0.13	2.23	0.00
GRAPE	2,879.21	156.71	11,338.63
GRAPE, WINE	2,350.39	1,055.32	542.14
GRAPEFRUIT	5.36	0.00	0.62
KIWI	0.00	0.00	0.11
LEMON	0.90	0.00	0.00
LETTUCE, HEAD	0.01	0.00	0.00
LETTUCE, LEAF	0.01	0.00	0.00
MELON	0.00	46.73	0.00
NECTARINE	91.26	0.00	1,302.70
N-OUTDR PLANTS IN CONTAINERS	15.16	0.00	36.55
OAT	0.00	0.00	0.01
ONION, DRY	266.60	0.24	61.12
ONION, GREEN	0.04	0.00	0.00
ORANGE	149.02	0.00	18.99
PARSLEY	18.85	0.00	0.00
PASTURELAND	0.00	0.00	0.00
PEACH	149.45	0.00	1,208.44
PEAR	0.00	0.00	6.96
PEPPER, FRUITING	126.07	0.00	0.00
Crop/Site	**Arvin**	**Mendota**	**Parlier**

PERSIMMON	0.00	0.00	0.31
PISTACHIO	6.44	5.01	7.15
PLUM	2.98	0.00	245.64
POMEGRANATE	0.00	280.34	0.00
POTATO	5,387.62	0.00	0.00
PRUNE	0.00	0.00	6.92
RESEARCH COMMODITY	0.00	0.00	0.00
RIGHTS OF WAY	0.00	0.00	0.03
SAFFLOWER	0.00	0.00	0.00
SOIL FUMIGATION/PREPLANT	0.00	0.00	999.59
SUGARBEET	0.00	44.01	0.00
TANGERINE	2.36	0.00	0.86
TOMATO	0.00	12.52	0.00
TOMATO, PROCESSING	239.46	1,871.23	0.00
TURF/SOD	0.00	0.00	0.53
UNCULTIVATED AG	0.19	0.59	0.35
WALNUT	45.37	0.00	11.22
WATER AREA	0.00	0.00	0.01
WATERMELON	259.81	0.00	0.00
WHEAT	63.22	1.95	0.00
Number of Crops/Sites	39	19	38

Table 6. Regional (within five miles of the community) pesticide use density (pounds/mi^2) for the leading candidate communities, 2001 – 2003.

Type of Pesticide	Year	Arvin	Mendota	Parlier
Fumigant	2001	4,803	704	1,897
	2002	12,649	826	1,896
	2003	11,166	2,205	2,016
Organophosphates	2001	122	275	494
	2002	144	197	499
	2003	143	235	408
Other	2001	179	253	185
	2002	228	285	166
	2003	202	222	135
Sulfur-Copper	2001	5,647	3,061	7,120
	2002	5,405	4,156	8,392
	2003	4,833	2,723	6,242

Figure 1. Locations of highly rated communities for DPR's environmental justice pilot project.

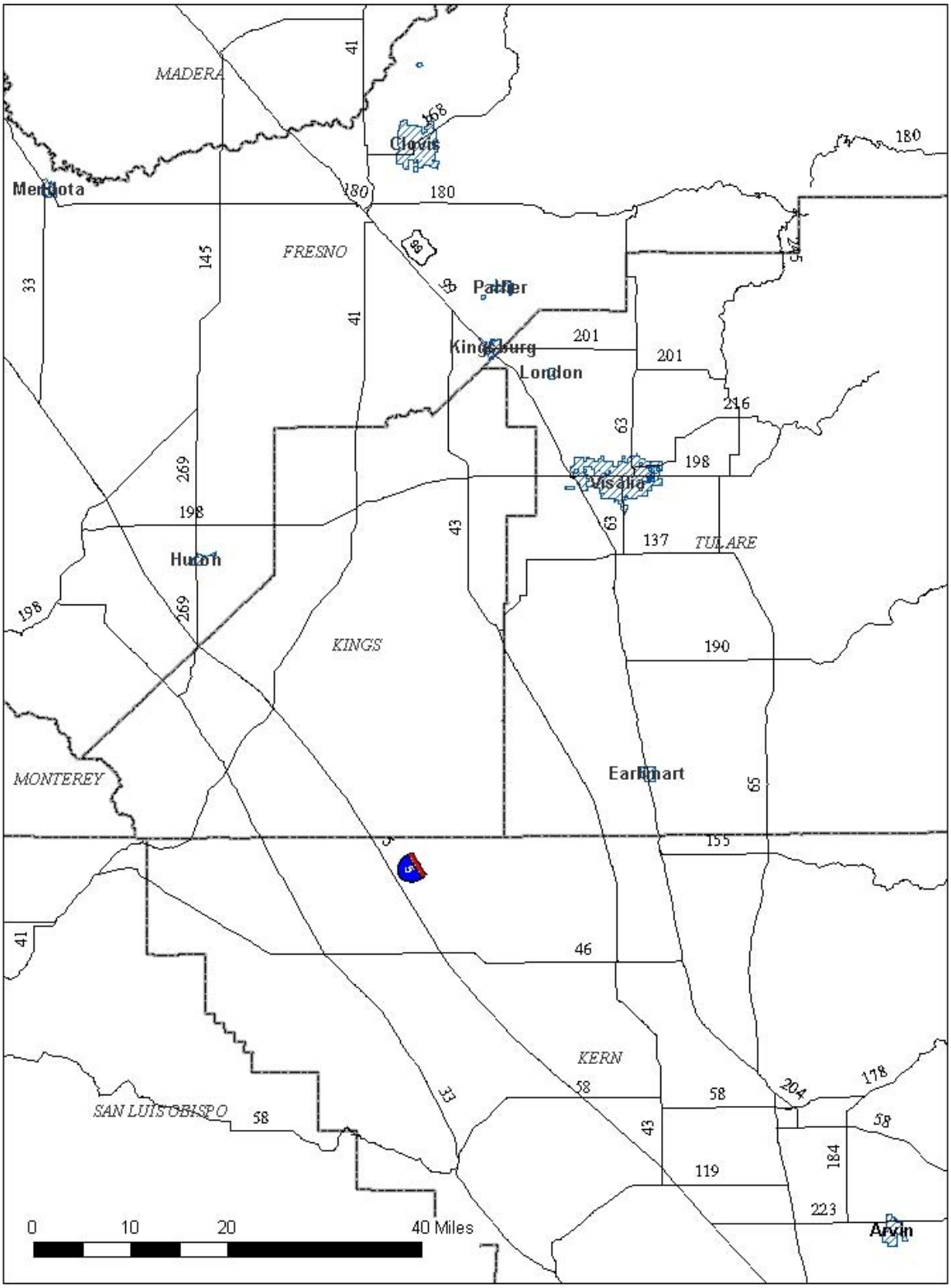

Figure 2. Wind speed at several high-rated communities, 1995 – 2004.

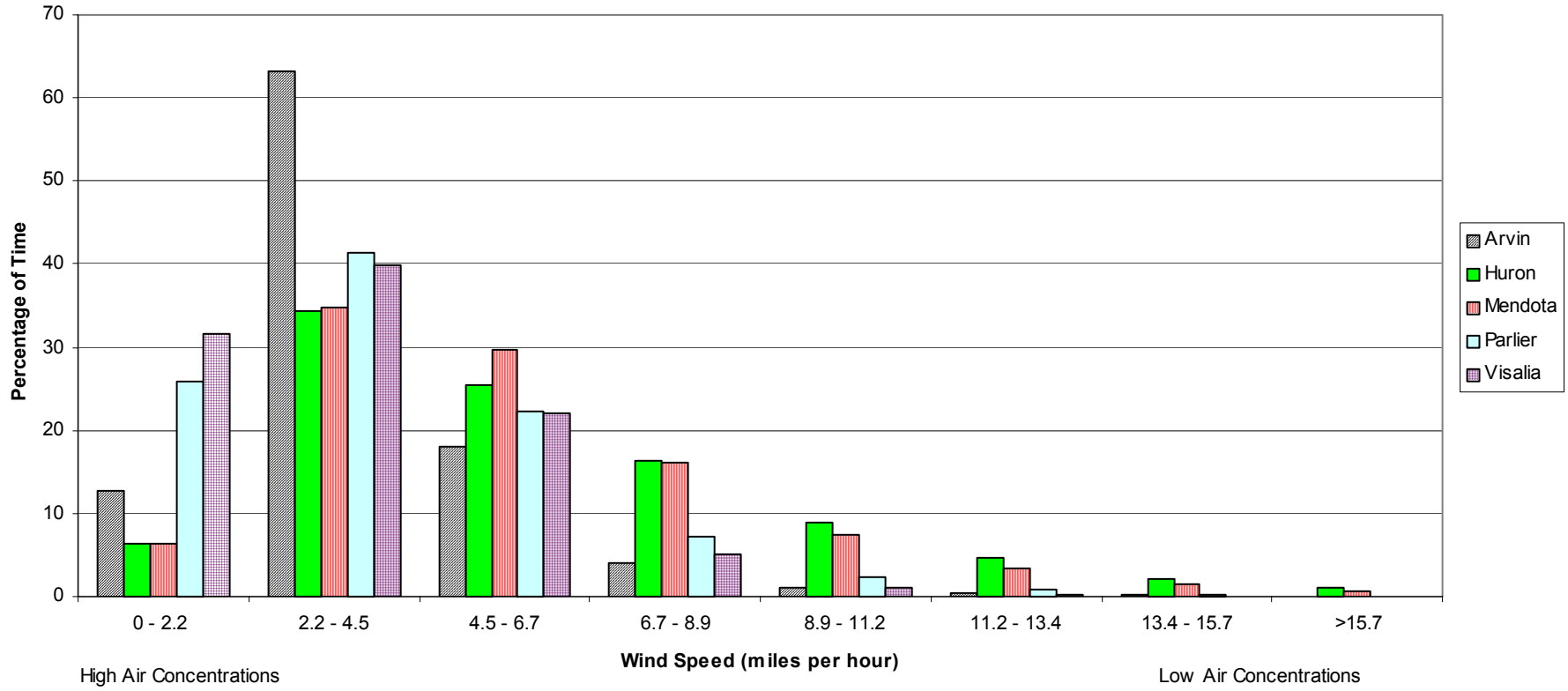

Figure 3. Wind direction at several high-rated communities, 1995 – 2004.

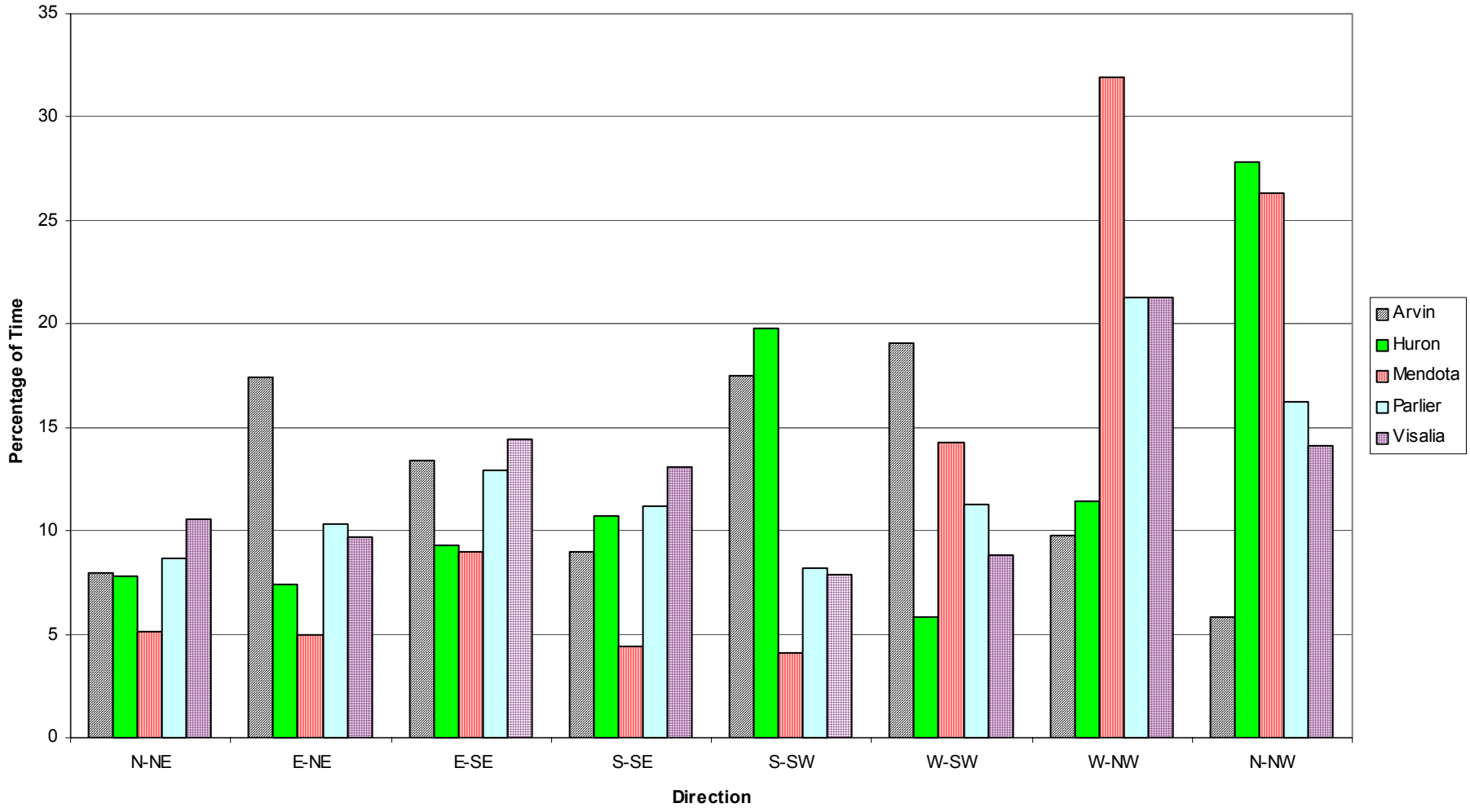

Figure 4. Regional (within five miles of community) use of pesticides for Arvin by month, 2002.

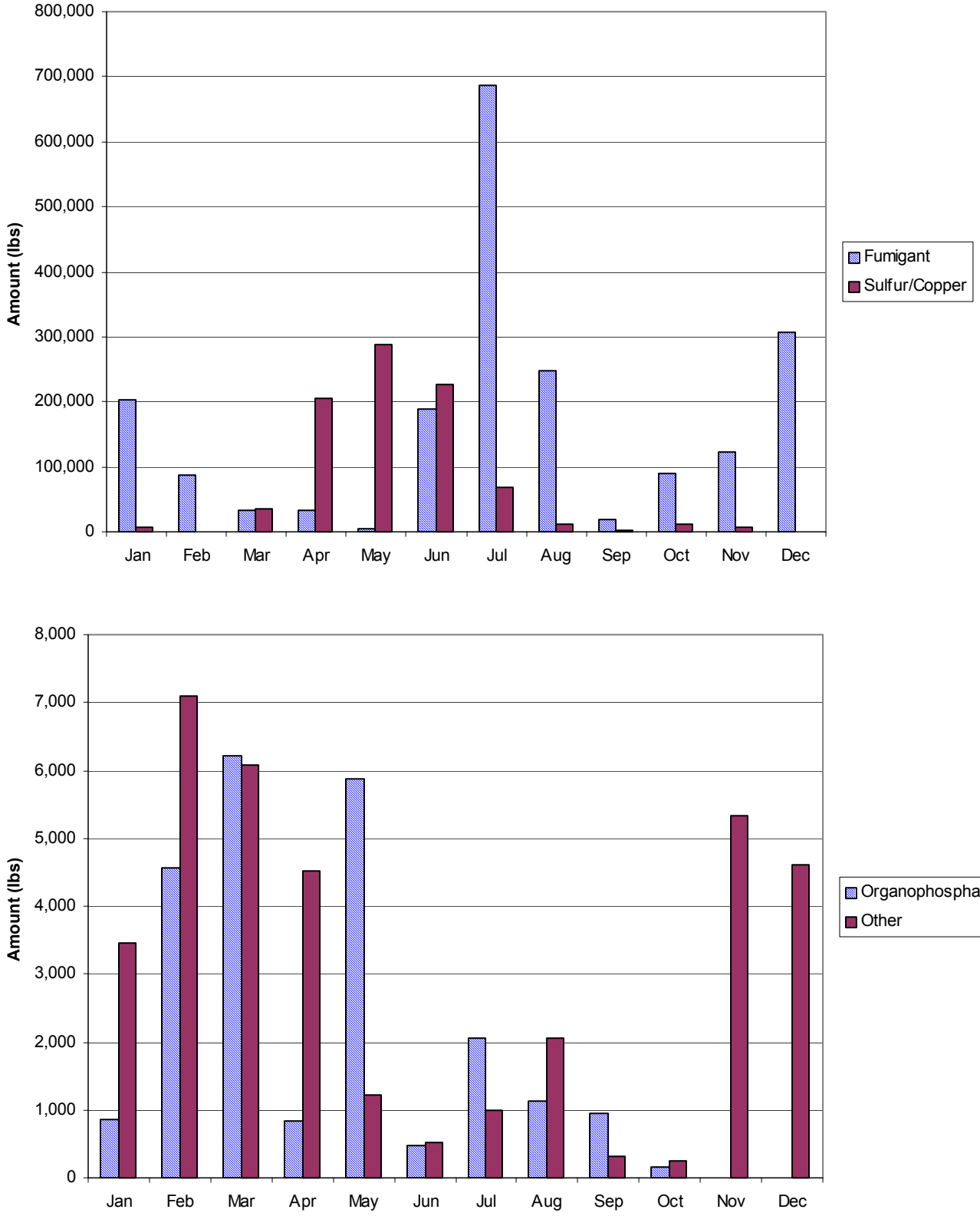

Figure 5. Regional (within five miles of community) use of pesticides for Mendota by month, 2002.

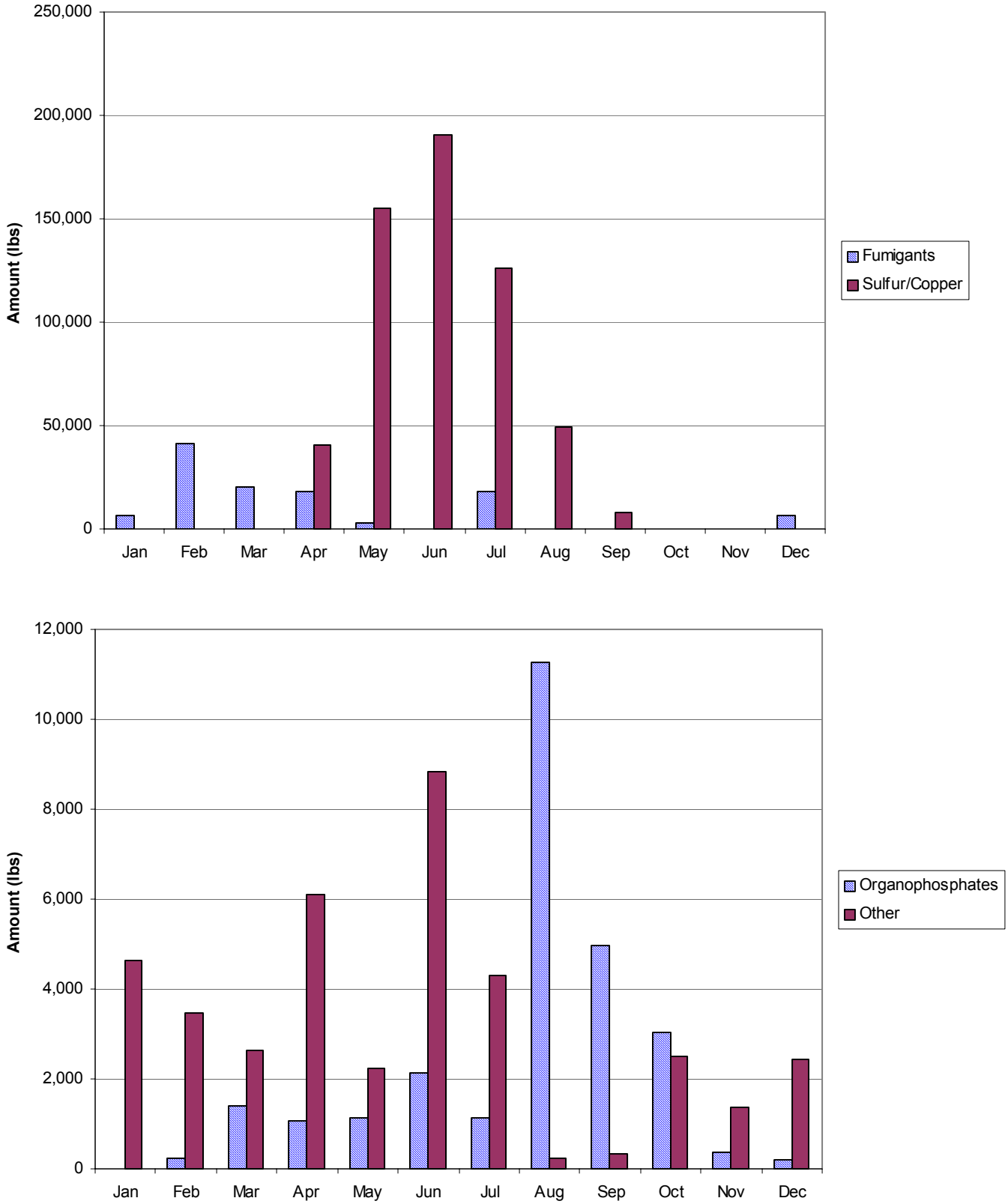
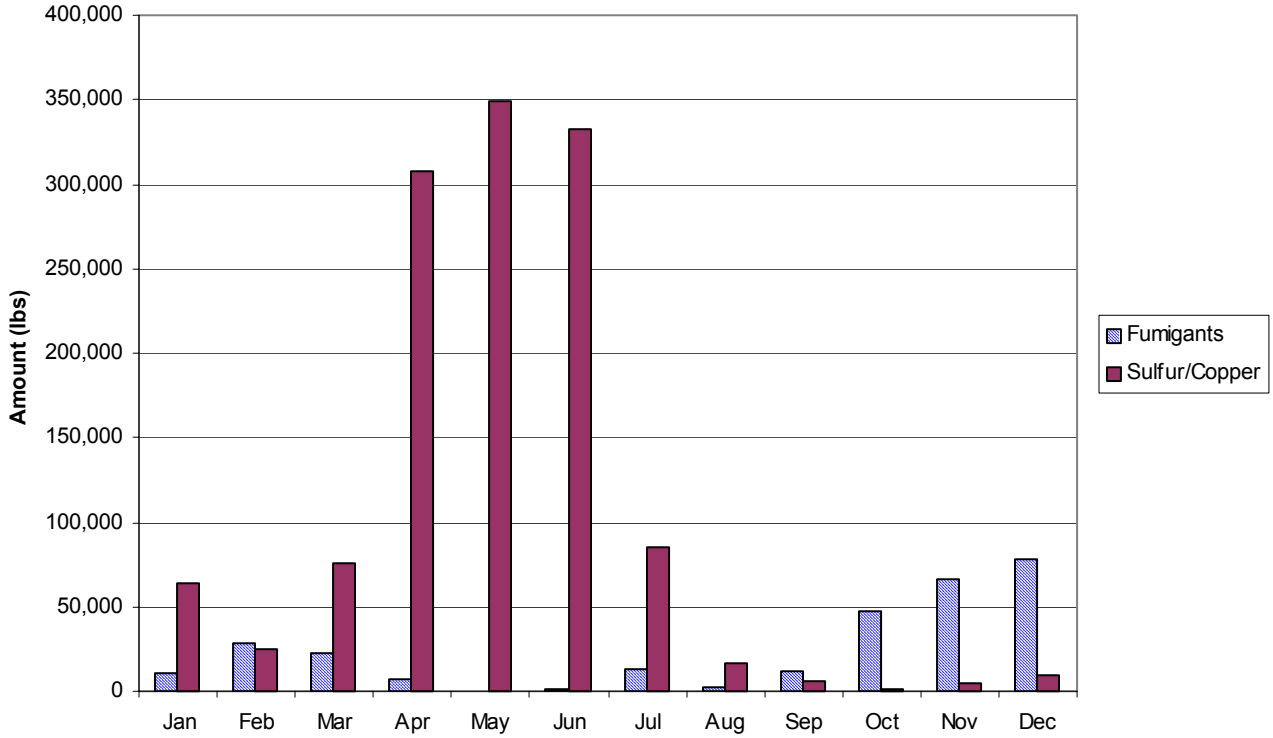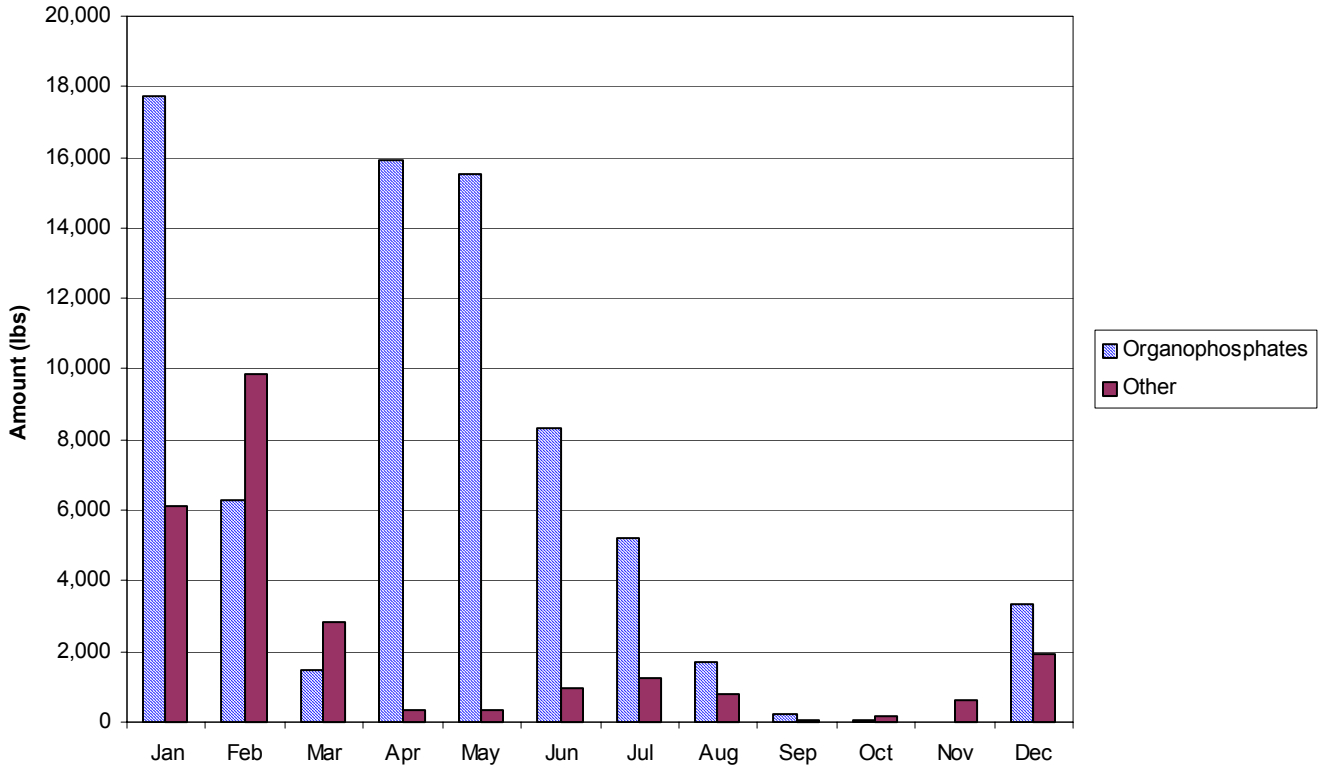
Figure 6. Regional (within five miles of community) use of pesticides for Parlier by month, 2002.