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Atmospheric Transport of Pesticides in the Sacramento, California, Metropolitan Area, 1996–1997

Water Resources Investigations Report 02-4100

Prepared in cooperation with the

California Regional Water Quality Control Board, Central Valley Region
California Department of Pesticide Regulation

NATIONAL WATER-QUALITY ASSESSMENT PROGRAM

U.S. Department of the Interior
U.S. Geological Survey

Atmospheric Transport of Pesticides in the Sacramento, California, Metropolitan Area, 1996–1997

By Michael S. Majewski[1] *and* David S. Baston[2]

U.S. GEOLOGICAL SURVEY

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6006-03

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2002

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FOREWORD

The U.S. Geological Survey (USGS) is committed to serve the Nation with accurate and timely scientific information that helps enhance and protect the overall quality of life, and facilitates effective management of water, biological, energy, and mineral resources. Information on the quality of the Nation's water resources is of critical interest to the USGS because it is so integrally linked to the long-term availability of water that is clean and safe for drinking and recreation and that is suitable for industry, irrigation, and habitat for fish and wildlife. Escalating population growth and increasing demands for the multiple water uses make water availability, now measured in terms of quantity and quality, even more critical to the long-term sustainability of our communities and ecosystems.

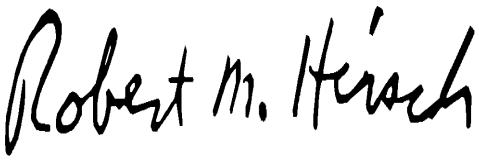
The USGS implemented the National Water-Quality Assessment (NAWQA) Program to support national, regional, and local information needs and decisions related to water-quality management and policy. Shaped by and coordinated with ongoing efforts of other Federal, State, and local agencies, the NAWQA Program is designed to answer: What is the condition of our Nation's streams and ground water? How are the conditions changing over time? How do natural features and human activities affect the quality of streams and ground water, and where are those effects most pronounced? By combining information on water chemistry, physical characteristics, stream habitat, and aquatic life, the NAWQA Program aims to provide science-based insights for current and emerging water issues. NAWQA results can contribute to informed decisions that result in practical and effective water-resource management and strategies that protect and restore water quality.

Since 1991, the NAWQA Program has implemented interdisciplinary assessments in more than 50 of the Nation's most important river basins and aquifers, referred to as Study Units. Collectively, these Study Units account for more than 60 percent of the overall water use and population served by public water supply, and are representative of the Nation's major hydrologic landscapes, priority ecological resources, and agricultural, urban, and natural sources of contamination.

Each assessment is guided by a nationally consistent study design and methods of sampling and analysis. The assessments thereby build local knowledge about water-quality issues and trends in a particular stream or aquifer while providing an understanding of how and why water quality varies regionally and nationally. The consistent, multi-scale approach helps to determine if certain types of water-quality issues are isolated or pervasive, and allows direct comparisons of how human activities and natural processes affect water quality and ecological health in the Nation's diverse geographic and environmental settings. Comprehensive assessments on pesticides, nutrients, volatile organic compounds, trace metals, and aquatic ecology are developed at the national scale through comparative analysis of the Study-Unit findings.

The USGS places high value on the communication and dissemination of credible, timely, and relevant science so that the most recent and available knowledge about water resources can be applied in management and policy decisions. We hope this NAWQA publication will provide you the needed insights and information to meet your needs, and thereby foster increased awareness and involvement in the protection and restoration of our Nation's waters.

The NAWQA Program recognizes that a national assessment by a single program cannot address all water-resource issues of interest. External coordination at all levels is critical for a fully integrated understanding of watersheds and for cost-effective management, regulation, and conservation of our Nation's water resources. The Program, therefore, depends extensively on the advice, cooperation, and information from other Federal, State, interstate, Tribal, and local agencies, non-government organizations, industry, academia, and other stakeholder groups. The assistance and suggestions of all are greatly appreciated.



Robert M. Hirsch
Associate Director for Water

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CONVERSION FACTORS, VERTICAL DATUM, AND ABBREVIATIONS

Multiply	By	To obtain
cubic meter (m^3)	264.2	gallon
gram (g)	0.03527	ounce, avoirdupois
gram per cubic meter (g/m^3)	0.4370	gram per cubic foot
kilogram (kg)	2.205	pound avoirdupois
kilometer (km)	0.6214	mile
liter per minute (L/min)	2.119	cubic foot per hour
meter (m)	3.281	foot
meter per second (m/s)	3.281	foot per second
milliliter (mL)	0.06103	cubic inch
millimeter (mm)	0.03937	inch

Temperature in degrees Celsius (°C) may be converted to degrees Fahrenheit (°F) as follows:

$$°F = (1.8)°C + 32$$

Abbreviations and Acronyms

cm, centimeter
m^3/min, cubic meter per minute
mi^2, square mile
ng/μL, nanogram per microliter
ng, nanogram
ng/m^3, nanogram per cubic meter
Pa, Pascal
μL, microliter
μm, micrometer

CARB, California Air Resources Board
DPR, California Department of Pesticide Regulation
FFA, Franklin Field Airport
GC, gas chromatograph
ITD, ion trap mass selective detector
OP, organophosphorus
PUF, polyurethane foam
SIA, Sacramento International Airport
SMA, Sacramento metropolitan area
SMAQMD, Sacramento Metropolitan Air Quality Management District

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ABSTRACT

Weekly composite, bulk air was sampled with respect to wind speed and direction from January 1996 through December 1997 in one urban and two agricultural locations in Sacramento County, California. The sampling sites were located along a north–south transect, the dominant directions of the prevailing winds. The samples were analyzed for a variety of current-use pesticides, including dormant orchard spray insecticides and rice herbicides. A variety of pesticides were detected throughout the year, predominantly chlorpyrifos, diazinon, and trifluralin. The data obtained during the winter and spring suggest that some pesticides used in agricultural areas become airborne and may be transported into the urban area. Confirmation of this drift is difficult, however, because these three predominant pesticides, as well as other detected pesticides, also are heavily used in the urban environment. The spring data clearly show that molinate and thiobencarb, two herbicides used only in rice production, do drift into the urban environment.

INTRODUCTION

The atmosphere is a major environmental compartment into which many pesticides can dissipate and be transported to areas far removed from their application site. A wide variety of pesticides have been detected in the air, rain, fog, and snow throughout the United States (Kutz and others, 1976; Glotfelty and others, 1987; Goolsby and others, 1994; Majewski and Capel, 1995; Foreman and others, 1997, 2000; Capel and others, 1998; Majewski and others, 2000). Studies show that pesticides become airborne during and after their application, and that postapplication volatilization from the treated surfaces is often a major dissipation pathway for many pesticides (Glotfelty, 1978; Majewski, 1991; Seiber and Woodrow, 1995). Volatilization is a continuous process, and as much as 80 to 90 percent of certain applied compounds can be lost to the atmosphere within a few days (Cliath and others, 1980; Glotfelty and others, 1990b; Majewski and others, 1993). Once airborne, the pesticide can be transported by wind and deposited in unintended areas by dry (gas and particle) and wet (fog, rain, and snow) depositional processes. These deposited residues can revolatilize, reenter the atmosphere, and be transported and redeposited downwind repeatedly until transformed or accumulated, usually in areas with cooler climates (Risebrough, 1990; Wania and Mackay, 1996).

California is one of the world's leading agricultural areas and uses many thousands of metric tons of pesticides every year. A wide variety of these pesticides have been detected in California air (Baker and others, 1996). Pesticides applied to one field can volatilize and drift through the air and fog and contaminate other nearby fields (Schomburg and others, 1991; Seiber and others, 1993). Seiber and others (1989) showed that pesticides used on an extensively grown crop, such as rice, can result in area-wide air contamination in California's Sacramento Valley. Several agrochemicals used in the Central Valley of California also have undergone long-range atmospheric transport and deposition into the Sierra Nevada (Zabik and Seiber, 1993; Aston and Seiber, 1997; McConnell and others, 1998; LeNoir and others, 1999).

The focus of many of the reported studies has been on agricultural pesticides, but many of the same chemicals are also used in the urban environment. In addition, most of the reported atmospheric pesticide studies sampled air continuously regardless of wind speed or direction. If a pesticide was detected, it was often assumed that the source must be from agricultural activities or nearby localized use.

Purpose and Scope

This study was designed to determine the temporal and spatial distribution and trends of selected agricultural pesticides in air during a 2-year period. The objective of the study was to determine whether pesticides used in nearby agricultural areas were drifting through the atmosphere into the urban environment.

Acknowledgments

We thank the California Air Resources Board and the Sacramento Metropolitan Air Quality Management District for providing access, space, and power at their established sampling facilities for the air samplers. Funding for this project was provided by the California State Regional Water Quality Control Board, the U.S. Geological Survey's National Water-Quality Assessment Program, and the California Department of Pesticide Regulations.

SAMPLE COLLECTION

Weekly composite, bulk air samples were collected with respect to wind speed and direction from January 1996 through December 1997 at one urban and two agricultural locations in Sacramento County, California. These three air sampling sites were established on a north–south transect near the Sacramento River (fig. 1) along the predominant direction of wind flow. This sampling transect included agricultural areas, such as pastures, row crops, and orchards, and a major urban area.

Study Area Description

The study area was defined by a 50- to 70-km (kilometer) radius circle around each sampling site (fig. 1). Land use for nine counties in the study area was mapped (California Department of Water Resources, 1990, 1994, 1995a,b, 1996a,b, 1999) and the pesticide use data for 1996 (California Department of Pesticide Regulation, 1997) and 1997 (California Department of Pesticide Regulation, 1998) for each part of the county within the study area were used in the analysis of the results. The land use in four counties that extended only partly into the study area from the east and one county from the west were not included in the analysis because the eastern counties are in the foothill area of the Sierra Nevada, which have little or no agricultural activity. The part of the western county that extends into the study area also is mountainous and has little or no agricultural activity.

Sampling Site Description

The northern most site was near orchards, row crops and rice fields north of Sacramento at the northeastern edge of the Sacramento International Airport (SIA) at latitude 38° 42' 49.7" N and longitude 121° 35' 24.2" W. The central sampling site was in the Sacramento metropolitan area (SMA) at latitude 38° 34' 04.8" N and longitude 121° 29' 35.1" W, and the southern most site was in a predominantly pasture area south of Sacramento near Franklin Field Airport (FFA) at latitude 38° 18' 08.7" N and longitude 121° 25' 17.8" W. Each of these sites was at an existing air monitoring station established and maintained by either the California Air Resources Board (CARB) or the Sacramento Metropolitan Air Quality Management District (SMAQMD).

The SIA and FFA samplers and meteorological stations were at SMAQMD sites and mounted on the roofs of small trailers that contained the agency's ozone sampling and analytical instrumentation. The air samplers were elevated about 3 m (meter) above the ground. The SMA site was in downtown Sacramento on the second floor roof of a CARB office building, about 10 m above the ground. The area surrounding all three sampling sites conformed to the specifications for establishing atmospheric deposition sites outlined by the U.S. Environmental Protection Agency (1999) and National Atmospheric Deposition Program/National Trends Network (Bigelow, 1984).

Each sampling site consisted of two air sampling cartridges contained in a single aluminum environmental enclosure that protected the sampling cartridges and pumps from direct sunlight and precipitation, while allowing free air movement into the sampling area. Polyurethane foam (PUF) was the air sampling matrix.

Collection Procedure

The on/off operation of each sampler was controlled by a data logger that also recorded 15-minute averages of wind speed and direction, air temperature, relative humidity, and rainfall from the onsite meteorological station. Specific meteorological conditions triggered the sampling events. For example, the sampling cartridge designated as "North" was turned on for 5 minutes when the average wind speed for the previous 15-minute period was greater than 1 m/s (meter per second) and the average wind direction was between 315° and 45° (360°/0° = north). The sampling cartridge designated as "South" was turned on for 5 minutes when the average wind speed for the previous 15-minute period was greater than 1 m/s and the average wind direction was between 135° and 225° (180° = south). The maximum time a sampler could be turned on in a 1-hour period was 20 minutes.

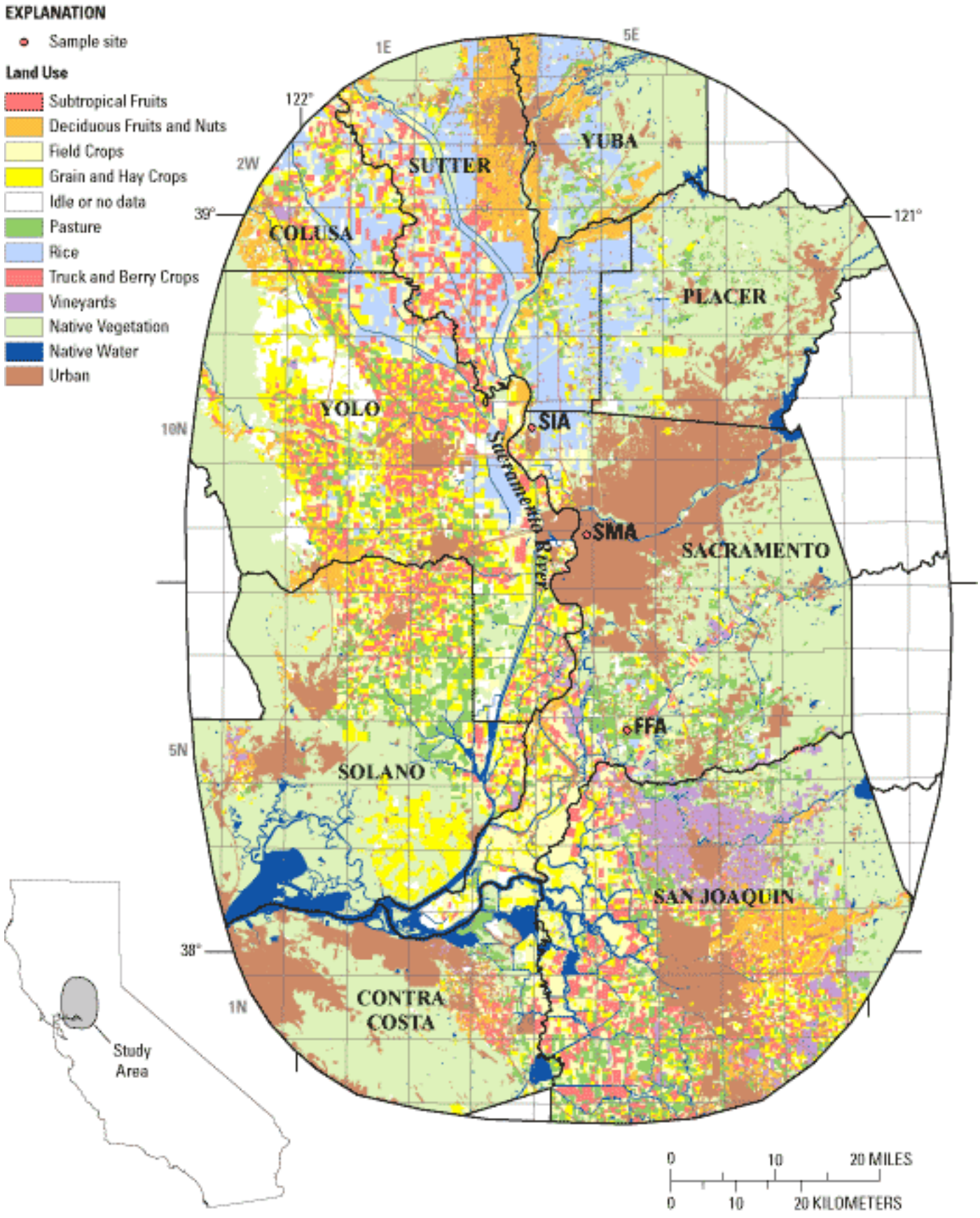

Figure 1. Study area showing the air sampling sites and land use within a 50-km (kilometer) or 70-km radius of each site in the Sacramento, California, metropolitan area. SIA, Sacramento International Airport; SMA, Sacramento metropolitan area; FFA, Franklin Field Airport.

The SMA site did not have directional sampling capabilities until mid-February 1996, so only one air sample was collected per week. During this time, the air sampler was turned on for 5 minutes every half hour, 24 hours per day, for a 7-day period. The flow rates and averaged total sample volumes for these samples were comparable to those obtained during the directional sampling.

Air was pulled through a primary and a secondary precleaned PUF plug [4.45 cm (centimeter) diameter × 7.62 cm each; average density = 0.043 g/m^3 (gram per cubic meter)] contained in a Teflon cartridge. The flow rates were maintained at approximately 100 L/min (liter per minute) using a high-volume blower motor. The flow rates were checked at the beginning and end of each sampling period by briefly attaching a calibrated flow meter to the intake of the cartridge while the blower motor was running. Each sample was a whole-air (no glass fiber prefilter was used to separate particulate matter), 7-day composite that processed between 66 and 135 m^3 (cubic meter) of air. At the end of each sampling period, both sampling cartridges were removed from the environmental enclosure, capped, and transferred to the laboratory where the PUFs were removed from the cartridge, placed in individual cleaned and baked glass jars, capped with Teflon-lined lids, labeled, and refrigerated at 4°C until analyzed.

The highest sampling frequency occurred during the winter (the dormant orchard spray season) and spring when weekly samples were collected continuously from January through May 1996 and from January through June 1997. During the remainder of the study, samples were collected every other week, with the exception of June through October 1996 when weekly samples were collected about every third week. The SIA site was operated through October 27, 1997, because SMAQMD moved the site to another location that was not available for sampling until after this study ended.

Seventeen pesticides (10 herbicides, 6 insecticides, 1 fungicide) were included in the analytical scheme (table 1). These compounds were selected on the basis of the total amount used in northern California during 1994 (California Department of Pesticide Regulation, 1994), their ability to become airborne during application and use, and our ability to collect and analyze them.

ANALYTICAL METHODOLOGY

Before being used for the first time, each PUF plug was washed in a dilute solution of Alconox and warm water. Residual water was removed using an acetone rinse. The PUF plugs were then extracted in a Soxhlet apparatus for 24 hours using analytical grade acetone followed by 24 hours using a 1:1 mixture of analytical grade hexane and ethyl acetate. The solvent cleaned PUFs were then dried in a vacuum oven under house vacuum at room temperature, or heated to no higher than 25°C. The clean, dry PUFs then were stored in individual cleaned and baked glass jars with Teflon-lined lids until used.

Sample Analysis

The chilled PUF samples were warmed to room temperature under subdued light before beginning the extraction process. Each PUF plug then was placed in a 500 mL (milliliter) Soxhlet apparatus, and 100 μL (microliter) of a 1 ng/μL (nanogram per microliter) solution containing the surrogate terbuthylazine was added. The samples then were extracted using about 300 mL of a 1:3 (v:v) mixture of ethyl acetate in hexane for 20 hours or overnight. The extract was concentrated to about 5 mL using a Kuderna–Danish apparatus at 85°C. Each extract was further concentrated to about 0.5 mL under a gentle stream of nitrogen. The sample extract then was passed through 1.00 g (gram) of fully activated florisil and eluted with three 3 mL aliquots of ethyl acetate. The extract was concentrated to about 1 mL under a gentle stream of nitrogen, 100 μL of toluene was added, along with 100 μL of a 1 ng/μL internal standard solution in toluene containing acenapthene-d_{10}, phenanthrene-d_{10}, and pyrene-d_{10}, and the final volume adjusted to 200 μL.

The samples were extracted and analyzed in sets, according to sampling date. That is, samples collected during a specific period were analyzed together. Some low air volume samples were not extracted, and others were extracted and analyzed at a later date. After each sample was extracted, the PUFs were recleaned by extracting in a Soxhlet apparatus for 24 hours using analytical grade ethyl acetate followed by 24 hours using analytical grade hexane before being dried in a vacuum oven under house vacuum at room temperature, or heated to no higher than 25°C. The clean, dry PUFs then were stored in cleaned and baked glass jars, sealed using Teflon-lined caps, and reused as needed. PUFs that were visibly stained or discolored were discarded.

Gas Chromatography

All the samples were analyzed using a Varian 3400C gas chromatograph (GC) with a Finnigan ion trap mass selective detector (ITD). The GC was fitted with a 30 m DB-1701 column [25 mm (millimeter) inner diameter, 0.25-μm (micrometer) film thickness], and 2 μL volumes of each sample were injected using split/splitless mode and a 0.5-minute split time. Helium was the carrier gas, and the injection port temperature

Table 1. CAS numbers, vapor pressures, reporting levels, collection efficiencies, and use data for the 17 selected analytes in the Sacramento, California, study area

[Subcooled liquid vapor pressure between 20 and 25°C unless otherwise noted (Majewski and Capel, 1995). Reporting levels and collection efficiency are estimated reporting level based on 100 m^3 (cubic meter) air volume (Majewski and others, 1998). Total recovery from 319 m^3 air volume PUF collection efficiency test. Amounts used in study area are from California Department of Pesticide Regulation (1997 and 1998). Sorted by decreasing order of the amount applied in the study area during 1996 and 1997. CAS, Chemical Abstracts Service; Pa, pascal; PUF, polyurethane foam; ns, not included in collection efficiency test spike mixture; nq, not quantifiable. kg, kilogram; ng/m^3, nanogram per cubic meter; %, percent]

Compound	CAS number	Subcooled liquid vapor pressure (Pa)	Reporting level (ng/m^3)	Collection efficiency (%)	Amount used in study area (kg)	Percent of total pesticide use in study area	Percent agricultural use	Percent nonagricultural use
HERBICIDES:								
Molinate[1]	2212-67-1	7.46E-01	0.20	75	319,541	21	100	0
Thiobencarb	28249-77-6	1.78E-03	0.10	95	260,502	17	100	0
Trifluralin	1582-09-8	9.84E-03	0.10	91	138,525	9	98.2	1.8
EPTC[1]	759-94-4	2.00E+00	0.10	3	71,317	5	99.9	0.1
Metolachlor[2]	51218-45-2	1.70E-03	0.10	53	61,190	4	99.5	0.5
Simazine	122-34-9	8.65E-04	0.25	59	57,805	4	76.6	23.4
Pendimethalin	40487-42-1	8.16E-03	0.20	95	18,931	1	48.3	51.7
Atrazine	1912-24-9	1.29E-03	0.05	nq	16,880	1	98.7	1.3
Alachlor	15972-60-8	4.14E-03	0.10	96	14,590	1	100	0
Dacthal	1861-32-1	6.78E-03	0.10	101	542	0	89.5	10.5
				Subtotal	959,823			
INSECTICIDES:								
Chlorpyrifos	2921-88-2	2.19E-03	0.20	85	190,999	12	60.8	39.2
Diazinon	333-41-5	8.00E-03	0.10	115	113,024	7	73.0	27.0
Carbaryl[3]	63-25-2	2.95E-03	0.15	122	79,067	5	97.6	2.4
Carbofuran[3]	1563-66-2	2.72E-02	0.15	128	31,544	2	99.9	0.1
Malathion[2]	121-75-5	6.01E-04	0.25	34	31,337	2	80.2	19.8
Methidathion[4]	950-37-8	2.60E-04	0.10	ns	27,863	2	100	0
				Subtotal	473,833			
FUNGICIDE:								
Chlorothalonil[4,5]	1897-45-6	2.32E+02	0.10	ns	119,176	8	97.4	1.6
				Total use in study area	1,552,832			

[1]Concentration may be low due to PUF breakthrough.
[2]Possible losses during sample preparation.
[3]Gas chromatography analytical performance problems resulting in variable results.
[4]Collection efficiency performance on PUF unknown.
[5]Vapor pressure measured at 40°C.

was maintained at 250°C. The temperature program for the column began with a 1-minute hold at 100°C, ramped at 13°C/minute to 250°C, held for 2 minutes, then ramped at 25°C/minute to 275°C and held for 1 minute. The total run time was 15 minutes. The GC to ITD transfer line was maintained at 205°C. The ITD was run in full scan mode from 100 to 358 m/z (mass per unit charge) and maintained at a temperature of 200°C.

The analytical approach was a multiclass, multiresidue method that included 10 herbicides, 6 insecticides, and 1 fungicide (table 1). The analytical method was a modified version of existing U.S. Geological Survey methods for analyzing pesticides in water (Crepeau and others, 1994; Zaugg and others, 1995). Each analyte detected was identified using three mass ions, where possible, having characteristic ion profiles of sufficient intensities and correct ratios to adequately distinguish the analyte from typical PUF blank noise. In addition, an analyte was not considered identified if its retention time differed from the standard by more that 0.4 minute. Analyte reporting levels were estimated based on a 100 m^3 sample volume. The actual reporting levels for each compound varied for each sample, however, owing to the variable sample volumes. Concentrations below the reporting level were estimated only when all the GC–ITD qualifying information were obtained (Zaugg and others, 1995). If a compound could be positively identified based on the ion profiles and ratios, it was reported; data were not censored.

Quality Control

Quality-control measures included the addition of terbuthylazine, a surrogate compound, to each sample prior to extraction to monitor laboratory sample preparation and analysis. Field blanks were collected at each site on rotation throughout the study by briefly placing a sampling cartridge containing two PUF plugs into the air sampling unit to simulate field handling. Passive blanks were also deployed every third month at each site during the week-long sampling period on rotation throughout the study by placing an open sampling cartridge containing two PUF plugs inside the sampling enclosure along with the two environmental samplers. These passive samples were deployed to determine whether air being drawn into the sampling area could contaminate the nonoperating unit. PUF plugs used for the field and passive blanks included reused cleaned PUF from previous field samples. The field and passive blank samples were extracted and analyzed with the sample sets.

The field and passive blank samples showed no detectable contamination from any of the pesticides analyzed for. The clean passive blank samples showed that no cross-contamination of the samples occurred during the week-long sampling periods when they were deployed. This indicated that the north and south samples could be collected in the same environmental enclosure.

PESTICIDE RECOVERIES

Laboratory Spike Samples

Laboratory spike samples were routinely prepared and analyzed along with the air sample sets by fortifying a PUF plug at a high [500 ng (nanogram)] or a low (75 ng) level prior to extracting the 17 compounds (table 1). Most of these pesticides exhibited good recoveries during both sample preparation and analysis, as well as good collection efficiency on the PUF plugs. The average recovery for all compounds from the laboratory spiked samples was 90 ± 9 percent at the low spike level and 98 ± 9 percent at the high spike level.

Collection Efficiency

Spiked PUF collection-efficiency tests were made as part of another study (Majewski and others, 1998; Foreman and others, 2000) to monitor the retention and migration of a variety of pesticides through two PUF plugs. These tests were carried out by spiking a glass fiber filter with a known amount of a mixture of 49 pesticides and drawing ambient air through the sampler at about 1 m^3/min (cubic meter per minute) under volume/average temperature conditions of 310 m^3/17°C, 850 m^3/16.1°C, and 1,730 m^3/24.5°C. The maximum sample volume in this study was 289 m^3 with an average of 91 m^3; therefore, the results of the 310 m^3 volume collection-efficiency tests were applicable. The collection efficiencies for many of the 17 compounds analyzed for were good, and a summary of the results are provided in table 1. The most volatile compound (EPTC) had a very poor collection efficiency (3 percent) and exhibited very short retention times on the PUF. Molinate exhibited substantial migration into the second PUF, but the overall collection efficiency (75 percent) was good. All other compounds exhibited minimal (less than 1 percent) or no migration into the second PUF. The collection efficiency for malathion and metolachlor were low (less than 60 percent, table 1). For these compounds, incomplete collection by the PUF or inadequate recoveries during sample preparation steps may not have been the problem. For some compounds, it is possible that oxidation reactions were occurring on the PUF during the sampling period because of airborne ozone and hydroxyl radicals that were also pulled through the PUF. This would reduce the recovery of the parent compound. The collection efficiencies for carbaryl and carbofuran were high

(122 and 128 percent, respectively). These results were due to the thermal instability of these compounds during GC–TID analysis. This condition can lead to high or low bias during quantitation (Zaugg and others, 1995), and all the reported values for these two compounds are estimated.

Methidathion and chorothalonil were not included in the original PUF collection efficiency experiments. Other research groups, however, have efficiently collected both methidathion (Glotfelty and others, 1986, 1990a) and chorothalonil (Rice and Chernyak, 1997) on PUF. Reporting levels for these compounds were not estimated, but the laboratory extraction and analytical efficiency for both compound was greater than 95 percent.

The collection efficiency for pesticides on PUF is a function of the volume of air passed through, the concentration of the compound in the air during the sampling period, the air temperature during the sampling period, and the chemical stability of the pesticide collected on the PUF. The collection efficiency experiments were carried out for 24-hour periods during relatively mild climatic conditions when the average daily air temperatures was around 17°C. Air temperatures in the Sacramento Valley can frequently exceed 38°C during July and August, and daily temperature maximums can reach 27°C or higher for weeks at a time during the summer and fall. No collection efficiency tests were conducted during these extreme conditions, but individual analysis of the primary and secondary PUF plugs frequently showed EPTC, molinate, and trifluralin concentrations in the secondary plug, sometimes at equal or greater concentrations than in the primary plug. These results indicate that migration of these compounds can occur during times of extreme air temperature, and the reported concentrations may represent minimum values due to incomplete or poor retention on the PUF. No other compounds were detected in the back PUF plugs in significant concentrations.

PESTICIDE DETECTION FREQUENCY

Pesticide Use Information

The California Department of Pesticide Regulation (DPR) annually collects information on agricultural and nonagricultural pesticide use in California. Agricultural pesticide-use data are very detailed and include weekly information on the amount used and the location of application to within 1 mi^2 (square mile). The nonagricultural and urban pesticide-use information is much less detailed. This information is compiled on a monthly basis only as the total amount used by county. Nonagricultural and urban pesticide use include application for structural and vertebrate pest control. DPR, however, uses a broad definition for agricultural pesticide use and includes uses on rights-of-way, landscape maintenance, commodity fumigation, and other urban applications as part of their database. When the DPR data were tabulated by commodity, these uses were separated and added to the county urban use data. For analytical purposes, the magnitude of pesticide use in the study area was compiled on a monthly basis. This allowed for a better comparison between agricultural and nonagricultural pesticide use and areal coverage.

Detection frequencies for most of the compounds analyzed were generally highest when the wind was from the south at all three sampling sites (table 2). The SMA site had the highest averaged sampling volumes when the wind was from the south, probably because the averaged wind speeds were slightly higher at the higher-elevation site, 10 m versus 3 m (in the lower atmosphere, wind speeds increase with height above the surface). The SIA samples, however, had higher averaged sample volumes when the wind was from the north. The wind speeds and, hence, the average sample volumes were generally lowest at the FFA site. The wind direction at the FFA site also had a larger westerly component than at the other sites, which would affect the frequency of sampler operation.

The predominant pesticides detected in the air at all three sites were chlorpyrifos, diazinon, and trifluralin. These pesticides are used in both agricultural and urban environments and, of the 17 pesticides analyzed for, accounted for 24 percent of the agricultural use and 76 percent of the nonagricultural/urban use in the study area during the 2-year study (California Department of Pesticide Regulation, 1997, 1998). The detection frequencies and detected mean, maximum, and minimum air concentrations for each compound, sampling direction, and site are listed in table 2 (a complete listing of the directional concentration data for each sampling period and site are given in appendices 1, 2, and 3 at back of report).

Herbicides

Several of the 10 herbicides analyzed for in the collected air samples were frequently detected during the study, but at different times of the year. Molinate and thiobencarb were detected at all sites only from April through June of 1996 and 1997, whereas pendimethalin was detected primarily during the winter and spring, coincident with its use. Trifluralin, however, was detected throughout the year.

Molinate and thiobencarb are primarily used on rice, although in 1997 some molinate use for landscape maintenance was reported. Applications of these two herbicides usually start in late April and are finished by

Table 2. Detection frequency, mean, standard deviation, maximum, and minimum air concentration values for pesticides in the Sacramento, California, study area, with respect to wind direction

[Air concentration values are in nanogram per cubic meter (ng/m^3). — indicates no data available; %, percent]

	Wind direction	Franklin Field Airport					Sacramento Metropolitan Area					Sacramento International Airport				
		Detection frequency	Mean	Standard deviation	Maximum	Minimum	Detection frequency	Mean	Standard deviation	Maximum	Minimum	Detection frequency	Mean	Standard deviation	Maximum	Minimum
HERBICIDES:																
Alachlor	South	0.0%	—	—	—	—	0.0%	—	—	—	—	4.6%	1.57	1.19	2.91	0.66
	North	0.0%	—	—	—	—	2.8%	0.39	0.31	0.61	0.17	0.0%	—	—	—	—
Atrazine	South	0.0%	—	—	—	—	0.0%	—	—	—	—	0.0%	—	—	—	—
	North	0.0%	—	—	—	—	1.4%	1.82	—	1.82	1.82	0.0%	—	—	—	—
Dacthal	South	11.4%	0.43	0.29	1.01	0.18	4.2%	0.16	0.08	0.24	0.08	10.8%	0.44	0.51	1.53	0.07
	North	2.9%	0.18	0.03	0.20	0.16	1.4%	0.33	—	0.33	0.33	0.0%	—	—	—	—
EPTC	South	5.7%	8.31	10.73	24.39	2.71	2.8%	0.93	0.83	1.52	0.34	3.1%	4.96	6.44	9.51	0.40
	North	5.7%	8.79	7.58	17.43	0.29	1.4%	0.19	—	0.19	0.19	3.1%	1.25	1.35	2.21	0.30
Metolachlor	South	7.1%	0.27	0.18	0.56	0.12	1.4%	0.60	—	0.60	0.60	9.2%	0.29	0.07	0.41	0.23
	North	7.1%	0.96	0.43	1.69	0.58	1.4%	0.08	—	0.08	0.08	4.6%	0.33	0.18	0.47	0.12
Molinate	South	7.1%	4.93	5.70	14.57	1.35	1.4%	1.66	—	1.66	1.66	23.1%	42.73	93.79	368.99	0.26
	North	12.9%	8.29	5.75	16.14	0.60	14.1%	13.39	7.42	26.56	5.18	21.5%	49.24	62.38	210.77	9.19
Pendimethalin	South	7.1%	2.47	1.97	4.58	0.08	12.7%	3.55	6.66	20.42	0.22	12.3%	0.97	0.86	2.26	0.10
	North	2.9%	0.50	0.69	0.99	0.01	4.2%	1.18	0.46	1.71	0.88	3.1%	0.53	0.54	0.91	0.15
Simazine	South	1.4%	0.36	—	0.36	0.36	1.4%	0.25	—	0.25	0.25	0.0%	—	—	—	—
	North	0.0%	—	—	—	—	0.0%	—	—	—	—	0.0%	—	—	—	—
Thiobencarb	South	0.0%	—	—	—	—	4.2%	30.00	50.53	88.35	0.39	18.5%	5.50	5.28	18.25	0.01
	North	7.1%	6.35	4.05	10.92	1.62	8.5%	12.62	14.29	40.50	1.55	16.9%	24.28	30.16	102.21	0.30
Trifluralin	South	71.4%	2.88	2.85	14.58	0.09	67.6%	2.29	1.97	10.28	0.08	81.5%	4.78	3.88	19.18	0.02
	North	40.0%	2.53	3.66	19.50	0.10	39.4%	3.63	8.14	43.01	0.17	66.2%	2.49	2.34	12.87	0.13
INSECTICIDES:																
Carbaryl	South	2.9%	1.88	1.75	3.12	0.64	1.4%	1.57	—	1.57	1.57	16.9%	1.34	1.10	3.67	0.42
	North	4.3%	5.87	3.63	8.77	1.80	1.4%	0.98	—	0.98	0.98	10.8%	6.43	10.84	30.56	0.63
Carbofuran	South	1.4%	0.33	—	0.33	0.33	32.4%	1.70	1.43	5.74	0.08	1.5%	3.38	—	3.38	3.38
	North	0.0%	—	—	—	—	19.7%	2.40	3.34	13.01	0.17	0.0%	—	—	—	—
Chlorpyrifos	South	31.4%	2.71	2.43	8.28	0.03	49.3%	3.46	3.74	18.66	0.10	27.7%	1.37	1.37	4.41	0.17
	North	17.1%	3.29	3.50	9.99	0.21	25.4%	4.03	4.57	18.64	0.40	12.3%	4.83	9.11	26.80	0.16
Diazinon	South	37.1%	4.90	5.69	19.11	0.20	46.5%	2.56	2.67	12.25	0.01	38.5%	8.31	22.52	112.16	0.40
	North	12.9%	3.02	5.05	15.71	0.25	9.9%	2.33	1.65	5.34	0.81	27.7%	5.75	6.66	22.57	0.41
Malathion	South	1.4%	1.13	—	1.13	1.13	5.6%	1.59	0.53	2.05	0.85	10.8%	1.49	1.08	3.27	0.23
	North	0.0%	—	—	—	—	1.4%	3.77	—	3.77	3.77	1.5%	2.89	—	2.89	2.89
Methidathion	South	1.4%	0.35	—	0.35	0.35	0.0%	—	—	—	—	1.5%	0.26	—	0.26	0.26
	North	0.0%	—	—	—	—	0.0%	—	—	—	—	0.0%	—	—	—	—
FUNGICIDE:																
Chlorothalonil	South	8.6%	14.74	30.20	76.36	1.17	4.2%	2.11	0.84	3.01	1.35	9.2%	2.78	1.91	5.27	0.22
	North	2.9%	23.27	10.81	30.91	15.63	5.6%	6.57	3.26	10.23	2.58	10.8%	13.44	20.89	52.85	0.38
Total samples	South	61					65					61				
	North	56					57					63				

the end of June. Most of the rice production occurred in the northern part of the study area, but there were also a few fields in the southern part (fig. 1). Because molinate and thiobencarb had no or very limited urban use, their presence in the urban atmosphere can be directly attributed to atmospheric drift from the rice production areas.

Both molinate and thiobencarb showed similar trends with the highest concentrations [about 369 and 102 ng/m^3 (nanogram per cubic meter), respectively] and detection frequencies occurring at SIA, consistent with its use (figs. 2 and 3 and table 2). When the wind was from the north, both compounds were frequently detected at all sites (figs. 2*B* and 3*B*). When the wind was from the south, both compounds were detected primarily at SIA (figs. 2*A* and 3*A*). The mean northerly detected molinate air concentration at the urban site was about 13 ng/m^3.

Thiobencarb showed a similar pattern (fig. 3), but had a mean detected urban concentration (21.31 ng/m^3) nearly twice that of molinate. This higher urban concentration can be attributed to two sampling periods, one in 1996 when the wind was from the north (40.50 ng/m^3), and one in 1997 when the wind was from the south (88.35 ng/m^3). These observed concentrations were considerably higher than during any other sampling period.

Frequently when the wind was from the north, a high concentration at the upwind (SIA) site was followed by a lower concentration at the downwind (SMA) site. The mean northerly detected urban molinate concentration (about 13 ng/m^3) was nearly three times less than the mean detected concentration at SIA (about 49 ng/m^3). The concentrations for molinate and thiobencarb detected in this study were comparable to those reported by Seiber and others (1989).

In 1996, when the wind was from the south, air concentrations for both molinate (fig. 2*A*) and thiobencarb (fig. 3*A*) were considerably less at SIA than in 1997. Air temperature ranges during April and May of both years were similar, but it rained considerably more during this period in 1996 (4.38 versus 0.58 cm, respectively), and the storm tracks were primarily from the south. Precipitation is a very efficient mechanism for cleaning the atmosphere. It is possible that the rain washed out most of the airborne molinate and thiobencarb from the atmosphere before it was able to drift significantly. In addition, the southern winds during the storms probably blew the airborne residues northward, away from the sampling sites. It is also possible that because rain affected the application times and the sampling periods were less frequent in 1996, maximum air concentrations were missed.

Trifluralin, an herbicide used on a variety of vegetable crops, also has nonagricultural uses in landscape maintenance, rights-of-way, structural pest control and uncultivated nonagricultural areas. This herbicide was frequently detected in samples collected throughout the 2-year study in about 75 percent of the samples when the wind was from the south and in about 50 percent of the samples when the wind was from the north (table 2). Ninety-eight percent of the reported trifluralin use in the study area was for agricultural purposes, and the highest agricultural use occurred from January through May, with little or no reported use in August through October. In many instances during the high-use period, detections at the urban site coincided with an equivalent or higher upwind concentration at either agricultural site (fig. 4), indicating possible drift from agricultural areas into the urban area. There were several instances (April and November 1996, and June 1997) when the air concentrations at the urban site were considerably higher than those at either agricultural site. These results may reflect localized urban use, as well as drift from agricultural areas. High trifluralin air concentrations were observed at the SIA site (fig. 4*A*) in August and September 1996, yet no agricultural use was reported for this period during both years. These instances could reflect local nonagricultural applications on the airport grounds, or show a possible deficiency in the classification of agricultural versus nonagricultural application in the pesticide use reporting system.

Alachlor, atrazine, dacthal, EPTC, and metolachlor are herbicides applied in spring on a variety of crops. Use of these compounds in the study area was low in terms of amount applied and areal coverage, and each had little or no reported nonagricultural use. Alachlor and atrazine use was not reported in nearly half the counties in the study area, and the applications were generally in small areas dispersed throughout the study area. For these reasons, these compounds would not be expected to have a significant presence in the atmosphere and, in fact, were detected in less than 5 percent of samples from every site. EPTC has the highest vapor pressure [2.00 Pa (Pascal)] of the 17 pesticides analyzed for. This implies that EPTC is very volatile and very conducive for being present in the lower atmosphere during and after application, yet the collection efficiency for EPTC on PUF was very poor. This may be the primary reason it was not detected more frequently.

The reported nonagricultural use for dacthal was 10.5 percent, but this amounted to only 57 kg (kilogram) of the herbicide applied in the entire urban area. Ninety-eight percent of the 2-year total reported use occurred in Yolo and Sacramento counties in 1996. Although dacthal use in the study area was low (542 kg), it was detected at all sites. The detection frequencies and mean air concentrations were highest at the agricultural sites when the wind was from the south

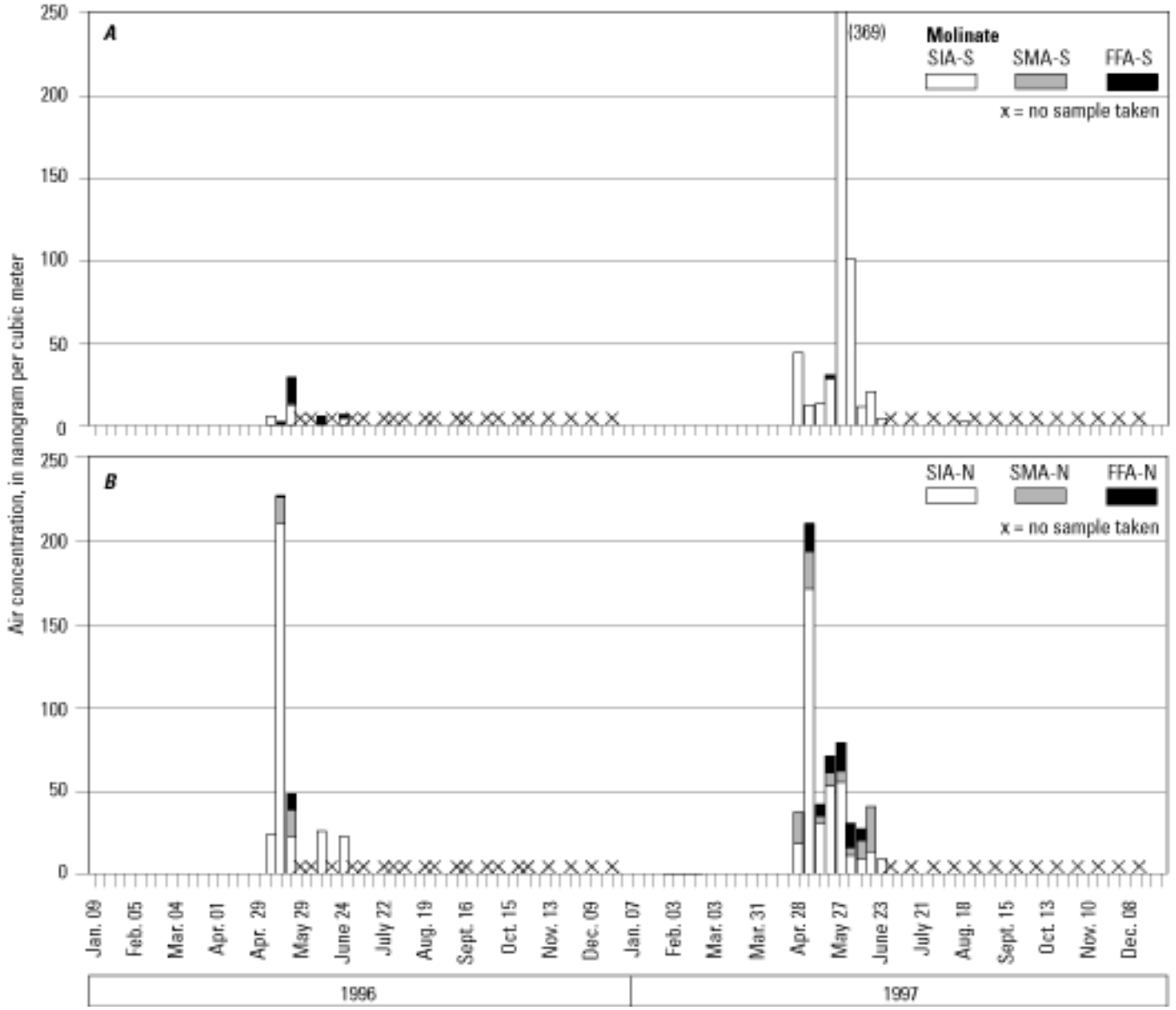

Figure 2. Plot showing the magnitude of the molinate air concentration in the Sacramento, California, study area for each sampling period from January 1996 through December 1997. (***A***) Values when the wind was from the south. (***B***) Values when the wind was from the north. X represents those time periods when samples were not taken. SIA, Sacramento International Airport; SMA, Sacramento metropolitan area; FFA, Franklin Field Airport; N, north; S, south.

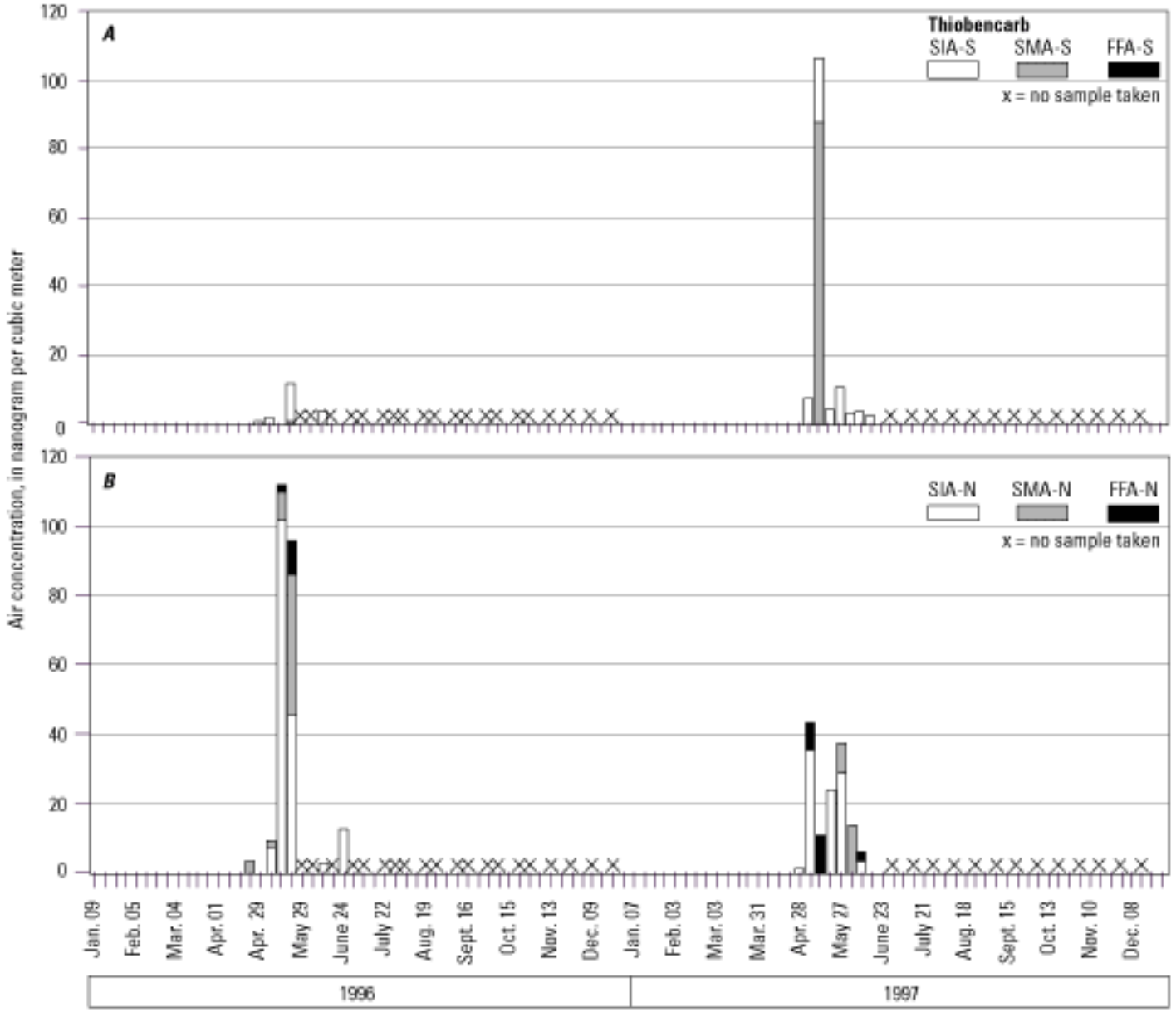

Figure 3. Plot showing the magnitude of the thiobencarb air concentration in the Sacramento, California, study area for each sampling period from January 1996 through December 1997. (***A***) Values when the wind was from the south. (***B***) Values when the wind was from the north. X represents those time periods when samples were not taken. SIA, Sacramento International Airport; SMA, Sacramento metropolitan area; FFA, Franklin Field Airport; N, north; S, south.

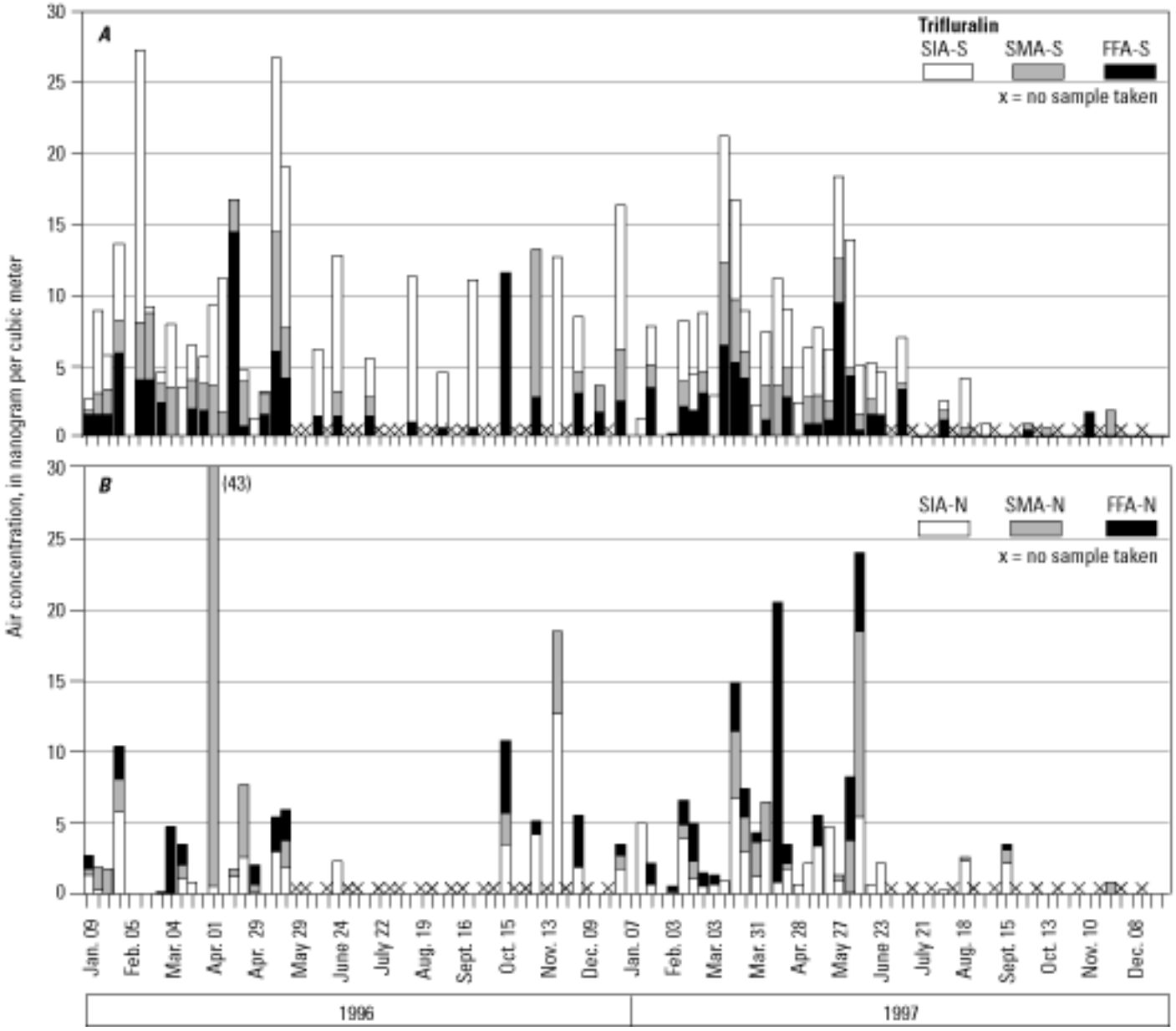

Figure 4. Plot showing the magnitude of the trifluralin air concentration in the Sacramento, California, study area for each sampling period from January 1996 through December 1997. (***A***) Values when the wind was from the south. (***B***) Values when the wind was from the north. X represents those time periods when samples were not taken. SIA, Sacramento International Airport; SMA, Sacramento metropolitan area; FFA, Franklin Field Airport; N, north; S, south.

(1.53 ng/m^3), and it was rarely detected at any site when the wind was from the north. This herbicide has a moderate persistence in soil with a soil half-life estimated between 34 and 100 days (Walker, 1978; Hurto and others, 1979; Ross and others, 1990; Majewski and others, 1991) and a potential for substantial losses from soil by volatilization (Ross and others, 1990; Majewski and others, 1991). This may explain why this herbicide was detected at all sites, even though it had very little reported use in the study area. Dacthal was frequently detected at low levels in the atmosphere throughout the Mississippi Valley (Majewski and others, 1998; Foreman and others, 2000), even in areas where there was little or no reported use. The physical and chemical properties of this herbicide give it the potential for long-range atmospheric transport (Foreman and others, 2000).

Simazine and pendimethalin had substantial nonagricultural use (23.4 and 51.7 percent, respectively) in the study area (table 1). Simazine was detected only once at both the FFA and SMA sites. These results also may be due to the physical and chemical properties of this compound. Simazine has the lowest vapor pressure (8.65 x 10^{-4} Pa) of the compounds analyzed, and it is often applied as a granular formulation. Both of these factors suggest that this compound is not conducive to entrainment into the lower atmosphere. Pendimethalin, however, did exhibit slightly higher detection frequencies at all sites and had higher mean and maximum concentrations at the urban site (6.66 and 20.42 ng/m^3, respectively) when the wind was from the south. The air mass associated with a southerly wind traveled over more of the Sacramento urban area (fig. 1) than when it was from the north. This suggests that the pendimethalin concentrations detected at SMA probably originated from nonagricultural/urban use. All sites had very few detections when the wind was from the north. The pendimethalin detections primarily occurred at each sampling site during the winter and spring, coincident with its use. Agricultural use of pendimethalin in the study area remained nearly constant during the 2-year study at 4,000 and 5,000 kg, respectively. Nonagricultural use in 1996, however, was more than double the use in 1997 (6,900 and 2,900 kg, respectively), but its use in Sacramento County dropped by over 70 percent during 1997. This is consistent with the detection frequency for this compound, which was much greater in 1996 than in 1997. It was detected only once in 1997.

Insecticides

The mass of insecticides applied in the study area over the 2-year study was less than half the amount of herbicides (473,833 and 959,823 kg, respectively) (California Department of Pesticide Regulation, 1997, 1998), although they were generally applied over the same area. Three organophosphorus (OP) insecticides—chlorpyrifos, diazinon, and malathion—had reported substantial nonagricultural use during the study. Only chlorpyrifos and diazinon, however, were detected more frequently in the urban environment along with carbofuran, a carbamate insecticide. Malathion and the other insecticides that were analyzed for (methidathion and carbaryl) were detected in less that 5 percent of the samples.

The OP insecticides diazinon and methidathion were used in dormant stone fruit and nut orchard applications from December through February during 1996 and 1997. Methidathion was detected only once at each of the agricultural sites and not at the urban site, but the amount used was considerably less than either chlorpyrifos or diazinon (table 1). Chlorpyrifos was not used as a dormant spray, but was used to control insects in fruit and nut orchards, as well as on field crops, such as alfalfa and cotton, during spring, summer, and fall, as was diazinon.

Chlorpyrifos and diazinon were both detected frequently at all sites, especially when the wind was from the south (figs. 5*A* and 6*A*). Downtown Sacramento had the highest detection frequency and the highest detected mean and maximum concentrations for chlorpyrifos when the wind was from the south (table 2). There were several sampling periods, usually during January and February (the dormant orchard spray period), when both chlorpyrifos and diazinon air concentrations at an upwind agricultural site were higher or equal to the air concentrations at the downwind urban site. These results indicate possible atmospheric drift of the dormant orchard spray insecticides into the urban area.

From April through September when the wind was from the south, an urban signature is apparent for these two insecticides, especially in 1996 (figs. 5*A* and 6*A*). During this period, the detection frequencies decreased at the agricultural sites, but not at the urban site. Some of the highest observed concentrations occurred at the urban site during April and May. When the wind is from the south, the air mass travels across a larger urban area than when the wind is from the north (fig. 1). This may be reflected in the high detection frequency and concentrations at SMA.

Because both of these insecticides are used in urban and agricultural areas throughout the year, no firm conclusions can be drawn about the atmospheric drift from agricultural to urban areas of these compounds without a better accounting of when and where nonagricultural uses occurred. It is probable that the insecticide concentrations detected at the urban site resulted from urban use, as well as drift from upwind

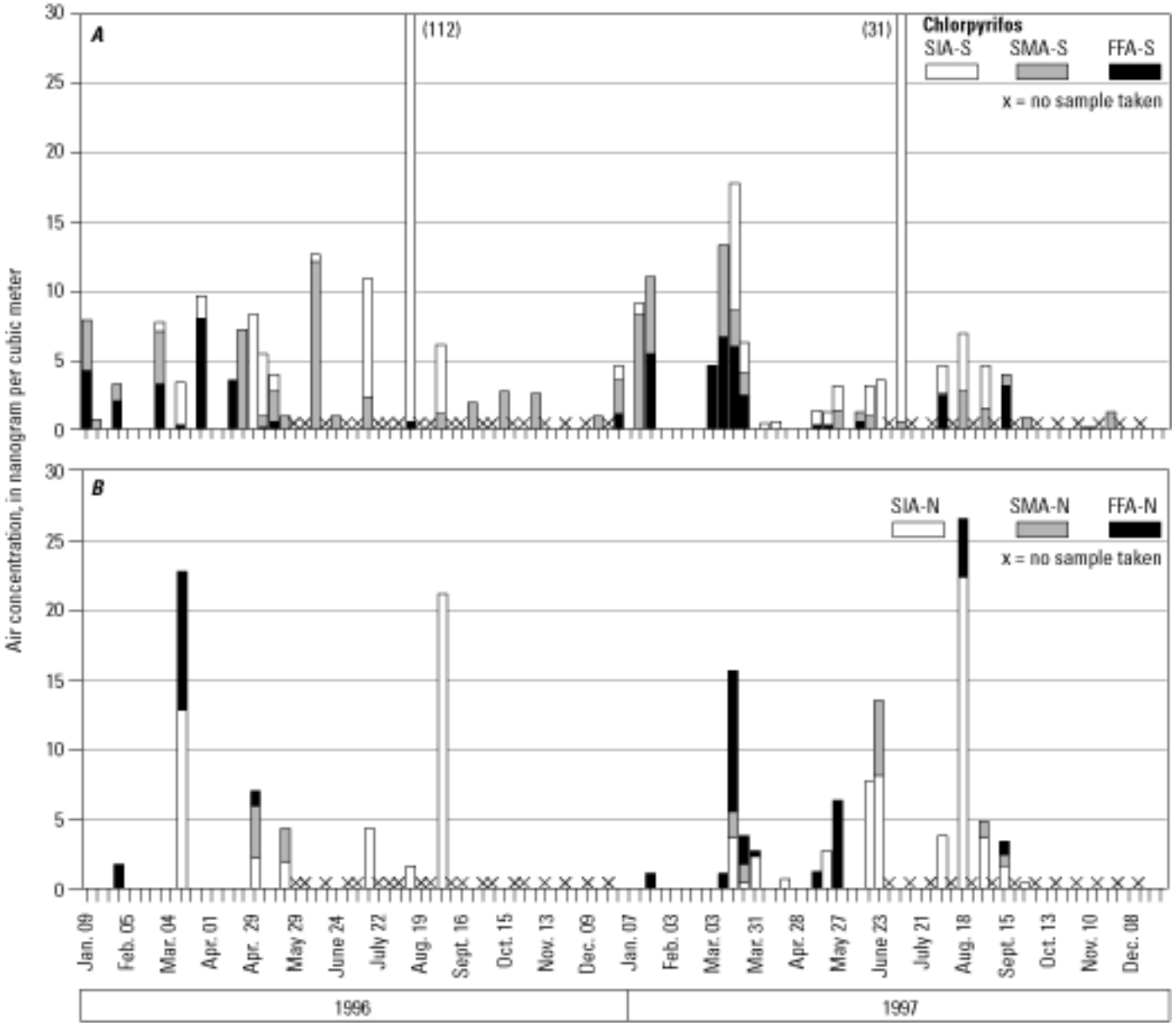

Figure 5. Plot showing the magnitude of the chlorpyrifos air concentration in the Sacramento, California, study area for each sampling period from January 1996 through December 1997. (***A***) Values when the wind was from the south. (***B***) Values when the wind was from the north. X represents those time periods when samples were not taken. SIA, Sacramento International Airport; SMA, Sacramento metropolitan area; FFA, Franklin Field Airport; N, north; S, south.

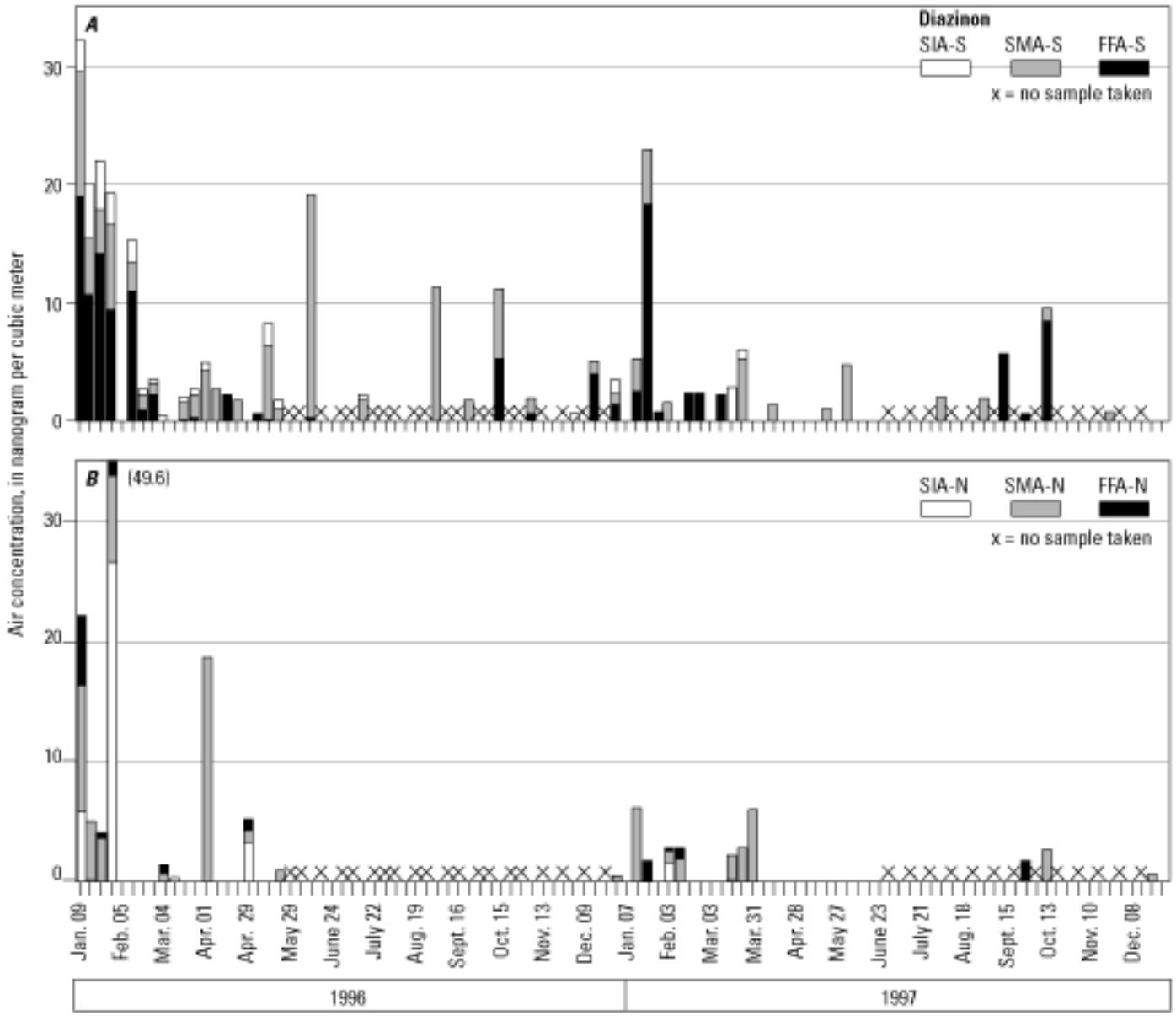

Figure 6. Plot showing the magnitude of the diazinon air concentration in the Sacramento, California, study area for each sampling period from January 1996 through December 1997. (***A***) Values when the wind was from the south. (***B***) Values when the wind was from the north. X represents those time periods when samples were not taken. SIA, Sacramento International

agricultural use. There does, however, appear to be a seasonal pattern for the chlorpyrifos and diazinon detections that may reflect agricultural use during the winter and urban use during spring and summer.

Malathion, also an OP insecticide, had a detection frequency and air concentrations far less than either chlorpyrifos or diazinon. Total agricultural use of malathion during 1996 and 1997 was nearly six times less than that of chlorpyrifos and three times less than that of diazinon. It has many of the same nonagricultural uses as chlorpyrifos and diazinon, but the amount of nonagriculturally applied malathion was nearly an order of magnitude less than either of the other two insecticides. This is reflected in the detection frequencies, which were also nearly an order of magnitude less at SMA (table 2). The most extensive agricultural applications of malathion occurred in August, but these were widely distributed throughout the study area. There were no extended areas where malathion was applied like chlorpyrifos and diazinon. PUF sampling problems were associated with this compound, however, that may have affected the detection frequency and observed concentrations.

Carbaryl and carbofuran are two insecticides that are used on a wide variety of agricultural crops, but had very little reported nonagricultural use during 1996 and 1997, 2.4 and 0.1 percent, respectively (table 1). The amount of carbaryl used during the 2-year study was more than twice that of carbofuran, and this was reflected in the detection frequencies at the SIA and FFA sites. Agricultural use of these two compounds in the study area was low, only 2 percent of all insecticides used, and the applications were widely distributed throughout the study area. These factors explain why these compounds were detected so infrequently at the agricultural sites. At the urban site (SMA), carbaryl was detected only once from each wind direction, but carbofuran was detected almost as frequent as chlorpyrifos (table 2). The highest detection frequency for carbofuran (about 32 percent) occurred when the wind was from the south, but the highest detected mean (2.40 ng/m^3) and maximum (13.01 ng/m^3) concentrations occurred when the wind was from the north (detection frequency about 20 percent). Carbofuran was detected only once at each of the agricultural sites, and a high concentration at an upwind site never corresponded with an equivalent or less air concentration at the downwind urban site. It is unclear why carbofuran was detected so frequently at the urban site and rarely at the agricultural sites. The only reported nonagricultural use for carbofuran in the study area was in one county (Sutter) during 1997. Analytical problems associated with these two compounds may have affected the magnitude of the observed concentrations, but it is unlikely that these problems would give consistent false positive results for carbofuran.

Fungicides

Chlorothalonil was the only fungicide analyzed for in this study. It was included in the analytical scheme because it was the second highest organic chemical fungicide used in California during 1994 and amenable to the analytical method. Chlorothalonil is used on a variety of fruit and vegetable crops and has nonagricultural uses in landscape maintenance, for structural pest control, on rights-of-way, and on ornamental turf. It was used sporadically throughout the year, but the most intense and widespread agricultural use during this study began in July, peaked in August, and diminished in September of both years. Chlorothalonil was detected at all three sampling sites during these months. Overall detections in 1996 were less than in 1997, and the detected mean 1997 air concentration was nearly 5 times greater (fig. 7). When the wind was from the south, the observed air concentrations were slightly less in 1997, with the exception of one high value (76.36 ng/m^3) at the FFA site in 1997 (table 2). In 1996, when the wind was from the north, chlorothalonil was detected infrequently and only at the SIA site and the detected mean concentration was very low (1.3 ng/m^3). In 1997, however, chlorothalonil was detected at all three sites and at considerably higher concentrations. There were several instances where high upwind concentrations coincided with lower concentrations being detected at the downwind urban site.

These observations were contrary to what was expected based on the reported use. Agricultural use of chlorothalonil in the study area was slightly less in 1997 (56,000 kg) than in 1996 (61,500 kg), and the nonagricultural use remained nearly constant for both years (about 1,000 kg (California Department of Pesticide Regulation, 1997, 1998). In 1996, the sampling frequency during July through September was every third week, whereas in 1997 it was increased to every second week. It is possible that the highest airborne concentrations were missed in 1996. Another possible explanation for the observed yearly differences could be air temperature. In July and August, both the average and maximum temperatures were higher in 1996 than in 1997. The average 1996 air temperature was 25°C versus 23°C in 1997, and the maximum air temperature was 40°C versus 35.5°C in 1997. This nearly 5°C difference in maximum air temperature may have adversely affected the collection efficiency of the PUF for this and the other analyzed compounds.

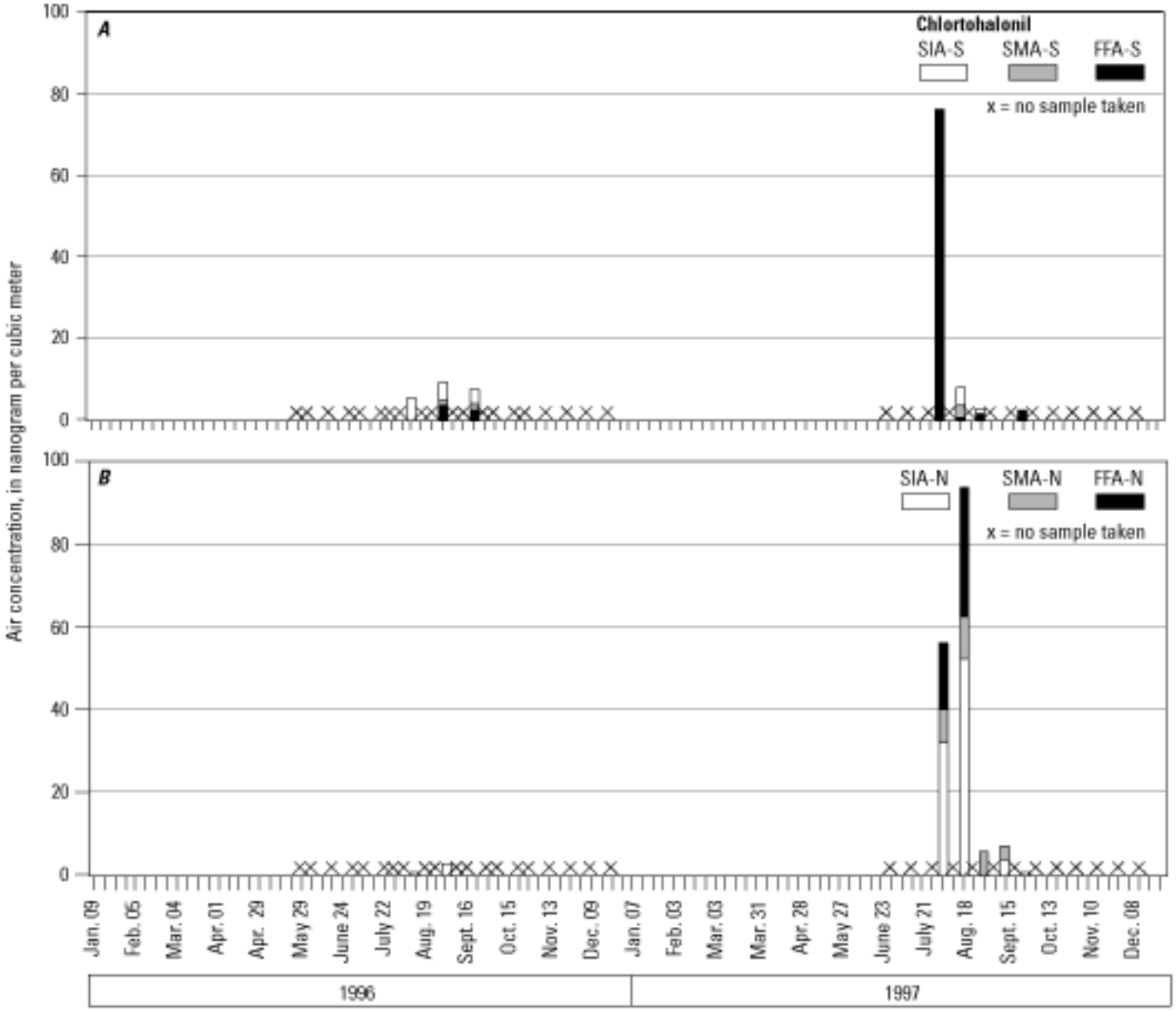

Figure 7. Plot showing the magnitude of the chlorothalonil air concentration in the Sacramento, California, study area for each sampling period from January 1996 through December 1997. (***A***) Values when the wind was from the south. (***B***) Values when the wind was from the north. X represents those time periods when samples were not taken. SIA, Sacramento International Airport; SMA, Sacramento metropolitan area; FFA, Franklin Field Airport; N, north; S, south.

CONCLUSIONS AND SUMMARY

Weekly composite, bulk air samples collected with respect to wind speed and direction in one urban and two agricultural locations showed a number of pesticides present in the atmosphere throughout the year. The highest detection frequencies occurred when the wind was from the south. The compounds detected most frequently, and at the highest concentrations, were chlorpyrifos, diazinon, molinate, thiobencarb, and trifluralin. The highest pesticide concentrations usually occurred at the agricultural sites and were generally related to the amount and timing of their use in the study area, but high concentrations were detected at the urban site. Other compounds, such as malathion, carbaryl, and pendimethalin, that had moderate to low reported use that was distributed throughout the study area, generally had low detection frequencies.

The results for molinate and thiobencarb offered the clearest example of pesticides used in agriculture drifting into the urban area. These two herbicides were used only during a specific period each year and had very little or no reported urban use. The results for these two herbicides, along with those for dacthal and pendimethalin, also showed a directional component to the source of airborne residues.

Data obtained during the winter suggest that agriculture-to-urban pesticide drift also may be occurring with chlorpyrifos, diazinon, and trifluralin, as evidenced by high upwind concentrations at an agricultural site corresponding to lower downwind concentrations at the urban site. Source confirmation of the drifting residues was difficult, however, because many of the agricultural pesticides, including these three, are also heavily used in the urban environment. On several occasions, the concentrations of several pesticides were higher at the urban site than at either agricultural site, suggesting urban use as the primary source.

The results for several compounds such as molinate, thiobencarb, and chlorothalonil showed year-to-year variations in concentration and detection frequencies that may be due to weather variabilities such as air temperature and precipitation. High air temperatures can increase the volatilization rates of many pesticides from treated areas, but it also decreases the collection efficiency of polyurethane foam (PUF) for some compounds, as evidenced by the migration of molinate and trifluralin into the secondary PUF. Precipitation can clean the atmosphere of any airborne pesticides, as well as alter planned applications for some pesticides. Gaps in the sampling may also have contributed to the observed variations.

The results for carbofuran were different than expected based on its use patterns. This compound had very little reported urban use, but was detected at the urban site in about 32 percent of the samples when the wind was from the south and in about 20 percent of the samples when the wind was from the north. The reasons for these counterintuitive results are unclear, but they may be related to how the use data for this compound is classified. They could also be related to analytical difficulties.

The collection of agricultural pesticide use data in California is very detailed, but urban application data are considerably less detailed. The lack of specific timing and application area detail in urban pesticide use, and the fact that several land-use classifications, such as landscape maintenance and use on rights-of-way, are included in agricultural use, makes it very difficult to make a meaningful analysis of urban pesticide use. Without more detail on when and where the nonagricultural pesticide use occurred, however, no firm conclusions can be drawn about the atmospheric movement of pesticides from agricultural area to urban areas. The residues detected in the urban air are, most likely, a result of both urban and agricultural sources.

Future long-term studies that investigate the atmospheric movement of pesticides should focus more on fully characterizing the collection efficiency of the target compounds on PUF, or any other air sampling matrices, through the range of seasonal conditions expected to be encountered. This is critical if the environmental samples will be subjected to temperature extremes, as was the case in this study. In addition, because the wind does not flow in just a northerly or southerly direction, future studies should consider sampling all four directional components of the wind.

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Appendix 1. Sampling date, rainfall amount, sample volume, and pesticide air concentration for each north and south sample taken at the Franklin Field Airport site, California

[Pesticides air concentrations are in nanogram per cubic meter (ng/m^3). LV, sample not analyzed because of low air volume; ND, not detected; NST, no sample taken; TWS, a 2-week sample. —, no data available; m^3, cubic meter]

Date	Rainfall (inches)	Sample volume (m^3)		EPTC (ng/m^3)		Molinate (ng/m^3)		Thiobencarb (ng/m^3)		Trifluralin (ng/m^3)		Atrazine (ng/m^3)	
		South	North	South	North	South	North	South	North	South	North	South	North
02-Jan-96	—	TWS	TWS	—	—	—	—	—		—	—	—	—
09-Jan-96	0.90	176	64.3	ND	ND	ND	ND	ND	ND	1.68	0.88	ND	ND
16-Jan-96	0.75	144	43.1	ND	ND	ND	ND	ND	ND	1.74	ND	ND	ND
22-Jan-96	1.82	176	64.3	ND	ND	ND	ND	ND	ND	1.74	ND	ND	ND
29-Jan-96	2.12	102	125	ND	ND	ND	ND	ND	ND	5.98	2.19	ND	ND
05-Feb-96	0.01	37.5	46.1	LV	ND	LV	ND	LV	ND	LV	ND	LV	ND
12-Feb-96	1.41	154	17.3	ND	ND	ND	ND	ND	ND	4.14	ND	ND	ND
19-Feb-96	0.94	135	10.6	ND	ND	ND	ND	ND	ND	4.18	ND	ND	ND
26-Feb-96	0.66	199	30.3	ND	ND	ND	ND	ND	ND	2.53	0.16	ND	ND
04-Mar-96	0.49	51.3	76.7	ND	ND	ND	ND	ND	ND	0.09	4.82	ND	ND
11-Mar-96	1.17	51.6	66.8	ND	ND	ND	ND	ND	ND	0.16	1.37	ND	ND
18-Mar-96	0.00	101	27.8	ND	ND	ND	ND	ND	ND	2.12	ND	ND	ND
25-Mar-96	0.08	76.5	33.6	ND	LV	ND	LV	ND	LV	2.00	LV	ND	LV
01-Apr-96	1.32	44.0	38.2	LV	LV	LV	LV	LV	LV	LV	LV	LV	LV
08-Apr-96	0.00	34.1	48.8	LV	LV	LV	LV	LV	LV	LV	LV	LV	LV
15-Apr-96	0.81	109	23.8	ND	LV	ND	LV	ND	LV	14.6	LV	ND	LV
22-Apr-96	0.00	27.7	142	ND	Sample lost	ND	—	ND	—	0.87	—	ND	—
29-Apr-96	0.00	97.6	80.5	ND	0.29	ND	0.67	ND	ND	0.15	1.21	ND	ND
06-May-96	0.00	89.4	36.1	ND	ND	ND	ND	ND	ND	1.76	ND	ND	ND
13-May-96	1.52	108	27.0	2.71	12.3	1.44	0.60	ND	1.62	6.12	2.36	ND	ND
20-May-96	0.05	69.8	152	3.40	ND	14.6	9.01	ND	8.96	4.27	2.05	ND	ND
29-May-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
03-Jun-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
10-Jun-96	0.00	30.1	8.0	ND	LV	5.71	LV	ND	LV	1.50	LV	ND	LV
17-Jun-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
24-Jun-96	0.00	55.5	21.9	ND	5.16	1.56	ND	ND	ND	1.56	ND	ND	ND
01-July-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
08-July-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
15-July-96	0.00	176	0.0	ND	LV	ND	LV	ND	LV	1.61	LV	ND	LV
22-July-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
29-July-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
05-Aug-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
12-Aug-96	0.00	232	1.8	ND	LV	ND	LV	ND	LV	1.10	LV	ND	LV
19-Aug-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
26-Aug-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
03-Sep-96	0.00	122	55.7	ND	ND	ND	ND	ND	ND	0.81	0.10	ND	ND
09-Sep-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—

Appendix 1. Sampling date, rainfall amount, sample volume, and pesticide air concentration for each north and south sample taken at the Franklin Field Airport site, California—*Continued*

Date	Rainfall (inches)	Sample volume (m^3)		EPTC (ng/m^3)		Molinate (ng/m^3)		Thiobencarb (ng/m^3)		Trifluralin (ng/m^3)		Atrazine (ng/m^3)	
		South	North	South	North	South	North	South	North	South	North	South	North
16-Sep-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
23-Sep-96	0.00	214	8.4	ND	LV	ND	LV	ND	LV	0.74	LV	ND	LV
30-Sep-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
08-Oct-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
15-Oct-96	0.00	72.6	114	ND	ND	ND	ND	ND	ND	11.6	5.01	ND	ND
22-Oct-96	0.63	NST	NST	—	—	—	—	—	—	—	—	—	—
28-Oct-96	—	NST	NST	—	—	—	—	—	—	—	—	—	—
04-Nov-96	1.04	120	69.1	ND	ND	ND	ND	ND	ND	2.92	0.83	ND	ND
13-Nov-96	—	TWS	TWS	—	—	—	—	—	—	—	—	—	—
19-Nov-96	0.74	64.5	49.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
26-Nov-96	0.08	NST	NST	—	—	—	—	—	—	—	—	—	—
02-Dec-96	0.77	33.3	23.6	ND	ND	ND	ND	ND	ND	3.25	3.49	ND	ND
09-Dec-96	1.66	NST	NST	—	—	—	—	—	—	—	—	—	—
16-Dec-96	1.98	182	4.0	ND	LV	ND	LV	ND	LV	1.85	LV	ND	LV
23-Dec-96	0.79	NST	NST	—	—	—	—	—	—	—	—	—	—
30-Dec-96	2.83	172	117	ND	ND	ND	ND	ND	ND	2.58	0.68	ND	ND
07-Jan-97	0.15	44.0	61.7	LV	ND	LV	ND	LV	ND	LV	ND	LV	ND
13-Jan-97	0.45	127	83.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
21-Jan-97	4.03	146	48.5	ND	ND	ND	ND	ND	ND	3.66	1.31	ND	ND
28-Jan-97	0.01	56.9	57.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
03-Feb-97	0.24	52.3	92.8	ND	ND	ND	ND	ND	ND	0.26	0.27	ND	ND
10-Feb-97	0.01	56.4	127	ND	ND	ND	ND	ND	ND	2.25	1.55	ND	ND
18-Feb-97	0.00	54.0	138	ND	ND	ND	ND	ND	ND	1.91	2.48	ND	ND
24-Feb-97	0.05	84.7	111	ND	ND	ND	ND	ND	ND	3.18	0.86	ND	ND
03-Mar-97	0.06	17.4	103	ND	ND	ND	ND	ND	ND	ND	0.57	ND	ND
10-Mar-97	0.33	66.8	69.2	ND	ND	ND	ND	ND	ND	6.62	ND	ND	ND
17-Mar-97	0.00	21.3	135	24.4	ND	ND	ND	ND	ND	5.35	3.23	ND	ND
24-Mar-97	0.00	40.4	95.3	2.72	ND	ND	ND	ND	ND	4.25	1.88	ND	ND
31-Mar-97	0.00	14.0	193	LV	ND	LV	ND	LV	ND	LV	0.65	LV	ND
07-Apr-97	0.00	30.4	99.7	ND	ND	ND	ND	ND	ND	1.27	ND	ND	ND
14-Apr-97	0.26	60.3	15.5	ND	ND	ND	ND	ND	ND	ND	19.5	ND	ND
21-Apr-97	0.03	49.3	62.0	ND	ND	ND	ND	ND	ND	2.97	1.14	ND	ND
28-Apr-97	0.00	45.2	34.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
05-May-97	0.00	32.5	13.0	ND	ND	ND	16.1	ND	7.64	1.08	ND	ND	ND
12-May-97	0.00	48.4	52.8	ND	ND	ND	5.26	ND	10.92	1.04	2.10	ND	ND
20-May-97	0.29	72.2	12.9	ND	ND	1.35	9.05	ND	ND	1.32	ND	ND	ND
27-May-97	0.00	24.1	22.6	ND	ND	ND	14.7	ND	ND	9.63	ND	ND	ND
02-June-97	0.23	28.3	41.1	ND	ND	ND	13.5	ND	ND	4.42	4.38	ND	ND
10-June-97	0.07	55.7	36.6	ND	ND	ND	5.69	ND	2.61	0.66	5.41	ND	ND
16-June-97	0.00	82.9	13.8	ND	ND	ND	ND	ND	ND	1.74	ND	ND	ND

Appendix 1. Sampling date, rainfall amount, sample volume, and pesticide air concentration for each north and south sample taken at the Franklin Field Airport site, California—*Continued*

Date	Rainfall (inches)	Sample volume (m^3)		EPTC (ng/m^3)		Molinate (ng/m^3)		Thiobencarb (ng/m^3)		Trifluralin (ng/m^3)		Atrazine (ng/m^3)	
		South	North	South	North	South	North	South	North	South	North	South	North
23-June-97	0.00	74.7	25.4	ND	ND	ND	ND	ND	ND	1.57	ND	ND	ND
30-June-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
07-July-97	0.00	27.8	8.9	ND	ND	ND	ND	ND	ND	3.41	ND	ND	ND
14-July-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
21-July-97	0.00	39.7	17.1	Samples lost		—	—	—	—	—	—	—	—
28-July-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
04-Aug-97	0.00	14.6	31.4	ND	ND	ND	ND	ND	ND	1.33	ND	ND	ND
11-Aug-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
18-Aug-97	0.11	38.9	11.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
25-Aug-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
02-Sep-97	0.00	43.6	20.0	ND	17.43	ND	ND	ND	ND	ND	ND	ND	ND
08-Sep-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
15-Sep-97	0.00	28.9	103	ND	ND	ND	ND	ND	ND	ND	0.36	ND	ND
22-Sep-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
29-Sep-97	0.02	41.5	49.7	ND	ND	ND	ND	ND	ND	0.64	ND	ND	ND
06-Oct-97	0.62	NST	NST	—	—	—	—	—	—	—	—	—	—
13-Oct-97	0.00	29.3	47.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
20-Oct-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
27-Oct-97	0.00	54.8	51.5	Samples lost		—	—	—	—	—	—	—	—
03-Nov-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
10-Nov-97	0.52	157	9.2	ND	ND	ND	ND	ND	ND	1.66	ND	ND	ND
17-Nov-97	0.69	NST	NST	—	—	—	—	—	—	—	—	—	—
24-Nov-97	2.46	112	76.6	Samples lost		—	—	—	—	—	—	—	—
01-Dec-97	2.35	NST	NST	—	—	—	—	—	—	—	—	—	—
08-Dec-97	0.65	57.6	101	Samples lost		—	—	—	—	—	—	—	—
15-Dec-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
22-Dec-97	0.00	19.9	146	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
29-Dec-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—

Appendix 1. Sampling date, rainfall amount, sample volume, and pesticide air concentration for each north and south sample taken at the Franklin Field Airport site, California—*Continued*

Date	Rainfall (inches)	Sample volume (m^3)		Simazine (ng/m^3)		Alachlor (ng/m^3)		Metolachlor (ng/m^3)		Dacthal (ng/m^3)		Pendimethalin (ng/m^3)	
		South	North	South	North	South	North	South	North	South	North	South	North
02-Jan-96	—	TWS	TWS	—	—	—	—	—	—	—	—	—	—
09-Jan-96	0.90	176	64.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
16-Jan-96	0.75	144	43.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
22-Jan-96	1.82	176	64.3	ND	ND	ND	ND	ND	ND	ND	ND	0.08	ND
29-Jan-96	2.12	102	125	ND	ND	ND	ND	ND	ND	0.38	ND	ND	ND
05-Feb-96	0.01	37.5	46.1	LV	ND	LV	ND	LV	ND	LV	ND	LV	ND
12-Feb-96	1.41	154	17.3	0.36	ND	ND	ND	ND	ND	1.01	ND	ND	ND
19-Feb-96	0.94	135	10.6	ND	ND	ND	ND	ND	ND	0.18	ND	ND	ND
26-Feb-96	0.66	199	30.3	ND	ND	ND	ND	ND	ND	0.33	ND	ND	ND
04-Mar-96	0.49	51.3	76.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
11-Mar-96	1.17	51.6	66.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
18-Mar-96	0.00	101	27.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
25-Mar-96	0.08	76.5	33.6	ND	LV	ND	LV	ND	LV	ND	LV	ND	LV
01-Apr-96	1.32	44.0	38.2	LV	LV	LV	LV	LV	LV	LV	LV	LV	LV
08-Apr-96	0.00	34.1	48.8	LV	LV	LV	LV	LV	LV	LV	LV	LV	LV
15-Apr-96	0.81	109	23.8	ND	LV	ND	LV	ND	LV	0.25	LV	ND	LV
22-Apr-96	0.00	27.7	142	ND	—	ND	—	ND	—	ND	—	ND	—
29-Apr-96	0.00	97.6	80.5	ND	ND	ND	ND	ND	ND	ND	0.16	ND	0.01
06-May-96	0.00	89.4	36.1	ND	ND	ND	ND	0.12	ND	ND	ND	ND	0.99
13-May-96	1.52	108	27.0	ND	ND	ND	ND	0.18	0.83	0.20	ND	ND	ND
20-May-96	0.05	69.8	152	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
29-May-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
03-June-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
10-June-96	0.00	30.1	8.0	ND	LV	ND	LV	0.56	LV	ND	LV	3.78	LV
17-June-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
24-June-96	0.00	55.5	21.9	ND	ND	ND	ND	ND	1.69	ND	ND	ND	ND
01-July-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
08-July-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
15-July-96	0.00	176	0.0	ND	LV	ND	LV	ND	LV	ND	LV	ND	LV
22-July-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
29-July-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
05-Aug-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
12-Aug-96	0.00	232	1.8	ND	LV	ND	LV	ND	LV	ND	LV	ND	LV
19-Aug-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
26-Aug-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
03-Sep-96	0.00	122	55.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
09-Sep-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
16-Sep-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
23-Sep-96	0.00	214	8.4	ND	LV	ND	LV	ND	LV	ND	LV	ND	LV

Appendix 1. Sampling date, rainfall amount, sample volume, and pesticide air concentration for each north and south sample taken at the Franklin Field Airport site, California—*Continued*

Date	Rainfall (inches)	Sample volume (m^3)		Simazine (ng/m^3)		Alachlor (ng/m^3)		Metolachlor (ng/m^3)		Dacthal (ng/m^3)		Pendimethalin (ng/m^3)	
		South	North	South	North	South	North	South	North	South	North	South	North
30-Sep-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
08-Oct-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
15-Oct-96	0.00	72.6	114	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
22-Oct-96	0.63	NST	NST	—	—	—	—	—	—	—	—	—	—
28-Oct-96	—	NST	NST	—	—	—	—	—	—	—	—	—	—
04-Nov-96	1.04	120	69.1	ND	ND	ND	ND	ND	ND	ND	ND	4.58	ND
13-Nov-96	—	TWS	TWS	—	—	—	—	—	—	—	—	—	—
19-Nov-96	0.74	64.5	49.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
26-Nov-96	0.08	NST	NST	—	—	—	—	—	—	—	—	—	—
02-Dec-96	0.77	33.3	23.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
09-Dec-96	1.66	NST	NST	—	—	—	—	—	—	—	—	—	—
16-Dec-96	1.98	182	4.0	ND	LV	ND	LV	ND	LV	ND	LV	ND	LV
23-Dec-96	0.79	NST	NST	—	—	—	—	—	—	—	—	—	—
30-Dec-96	2.83	172	117	ND	ND	ND	ND	ND	ND	ND	ND	3.19	ND
07-Jan-97	0.15	44.0	61.7	LV	ND	LV	ND	LV	ND	LV	ND	LV	ND
13-Jan-97	0.45	127	83.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
21-Jan-97	4.03	146	48.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
28-Jan-97	0.01	56.9	57.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
03-Feb-97	0.24	52.3	92.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
10-Feb-97	0.01	56.4	127	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
18-Feb-97	0.00	54.0	138	ND	ND	ND	ND	ND	ND	0.74	ND	ND	ND
24-Feb-97	0.05	84.7	111	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
03-Mar-97	0.06	17.4	103	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
10-Mar-97	0.33	66.8	69.2	ND	ND	ND	ND	ND	ND	0.33	ND	ND	ND
17-Mar-97	0.00	21.3	135	ND	ND	ND	ND	ND	0.94	ND	0.20	ND	ND
24-Mar-97	0.00	40.4	95.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
31-Mar-97	0.00	14.0	193	LV	ND	LV	ND	LV	ND	LV	ND	LV	ND
07-Apr-97	0.00	30.4	99.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
14-Apr-97	0.26	60.3	15.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
21-Apr-97	0.03	49.3	62.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
28-Apr-97	0.00	45.2	34.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
05-May-97	0.00	32.5	13.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
12-May-97	0.00	48.4	52.8	ND	ND	ND	ND	ND	0.58	ND	ND	ND	ND
20-May-97	0.29	72.2	12.9	ND	ND	ND	ND	0.32	ND	ND	ND	ND	ND
27-May-97	0.00	24.1	22.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
02-June-97	0.23	28.3	41.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
10-June-97	0.07	55.7	36.6	ND	ND	ND	ND	ND	0.74	ND	ND	ND	ND
16-June-97	0.00	82.9	13.8	ND	ND	ND	ND	0.19	ND	ND	ND	ND	ND

Appendix 1. Sampling date, rainfall amount, sample volume, and pesticide air concentration for each north and south sample taken at the Franklin Field Airport site, California—*Continued*

Date	Rainfall (inches)	Sample volume (m^3)		Simazine (ng/m^3)		Alachlor (ng/m^3)		Metolachlor (ng/m^3)		Dacthal (ng/m^3)		Pendimethalin (ng/m^3)	
		South	North	South	North	South	North	South	North	South	North	South	North
23-June-97	0.00	74.7	25.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
30-June-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
07-July-97	0.00	27.8	8.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
14-July-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
21-July-97	0.00	39.7	17.1	—	—	—	—	—	—	—	—	—	—
28-July-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
04-Aug-97	0.00	14.6	31.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
11-Aug-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
18-Aug-97	0.11	38.9	11.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
25-Aug-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
02-Sep-97	0.00	43.6	20.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
08-Sep-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
15-Sep-97	0.00	28.9	103	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
22-Sep-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
29-Sep-97	0.02	41.5	49.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
06-Oct-97	0.62	NST	NST	—	—	—	—	—	—	—	—	—	—
13-Oct-97	0.00	29.3	47.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
20-Oct-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
27-Oct-97	0.00	54.8	51.5	—	—	—	—	—	—	—	—	—	—
03-Nov-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
10-Nov-97	0.52	157	9.2	ND	ND	ND	ND	ND	ND	ND	ND	0.71	ND
17-Nov-97	0.69	NST	NST	—	—	—	—	—	—	—	—	—	—
24-Nov-97	2.46	112	76.6	—	—	—	—	—	—	—	—	—	—
01-Dec-97	2.35	NST	NST	—	—	—	—	—	—	—	—	—	—
08-Dec-97	0.65	57.6	101	—	—	—	—	—	—	—	—	—	—
15-Dec-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
22-Dec-97	0.00	19.9	146	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
29-Dec-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—

Appendix 1. Sampling date, rainfall amount, sample volume, and pesticide air concentration for each north and south sample taken at the Franklin Field Airport site, California—*Continued*

Date	Rainfall (inches)	Sample volume (m^3)		Chlorpyrifos (ng/m^3)		Diazinon (ng/m^3)		Malathion (ng/m^3)		Methidathion (ng/m^3)		Carbaryl (ng/m^3)	
		South	North	South	North	South	North	South	North	South	North	South	North
02-Jan-96	—	TWS	TWS	—	—	—	—	—	—	—	—	—	—
09-Jan-96	0.90	176	64.3	4.37	ND	19.1	5.74	ND	ND	ND	ND	ND	ND
16-Jan-96	0.75	144	43.1	ND	ND	10.9	ND	ND	ND	ND	ND	ND	ND
22-Jan-96	1.82	176	64.3	ND	ND	14.3	0.33	ND	ND	0.35	ND	ND	ND
29-Jan-96	2.12	102	125	2.22	1.75	9.55	15.7	ND	ND	ND	ND	ND	ND
05-Feb-96	0.01	37.5	46.1	LV	ND	LV	ND	LV	ND	LV	ND	LV	ND
12-Feb-96	1.41	154	17.3	ND	ND	11.2	ND	ND	ND	ND	ND	ND	ND
19-Feb-96	0.94	135	10.6	ND	ND	0.96	ND	ND	ND	ND	ND	ND	ND
26-Feb-96	0.66	199	30.3	3.49	ND	2.24	ND	ND	ND	ND	ND	ND	ND
04-Mar-96	0.49	51.3	76.7	0.03	ND	ND	0.63	ND	ND	ND	ND	ND	ND
11-Mar-96	1.17	51.6	66.8	0.49	9.75	ND	ND	ND	ND	ND	ND	ND	ND
18-Mar-96	0.00	101	27.8	ND	ND	0.20	ND	ND	ND	ND	ND	ND	ND
25-Mar-96	0.08	76.5	33.6	8.28	LV	0.42	LV	ND	LV	ND	LV	ND	LV
01-Apr-96	1.32	44.0	38.2	LV	LV	LV	LV	LV	LV	—	LV	—	LV
08-Apr-96	0.00	34.1	48.8	LV	LV	LV	LV	LV	LV	—	LV	—	LV
15-Apr-96	0.81	109	23.8	3.60	LV	2.21	LV	ND	LV	ND	LV	ND	LV
22-Apr-96	0.00	27.7	142	ND	—	ND	—	ND	—	ND	—	ND	—
29-Apr-96	0.00	97.6	80.5	ND	1.00	ND	0.82	ND	ND	ND	ND	ND	1.80
06-May-96	0.00	89.4	36.1	0.39	ND	0.60	ND	ND	ND	ND	ND	ND	7.03
13-May-96	1.52	108	27.0	0.77	ND	0.31	ND	ND	ND	ND	ND	0.64	8.77
20-May-96	0.05	69.8	152	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
29-May-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
03-June-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
10-June-96	0.00	30.1	8.0	ND	LV	0.42	LV	ND	LV	ND	LV	ND	LV
17-June-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
24-June-96	0.00	55.5	21.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
01-July-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
08-July-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
15-July-96	0.00	176	0.0	ND	LV	ND	LV	ND	LV	ND	LV	ND	LV
22-July-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
29-July-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
05-Aug-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
12-Aug-96	0.00	232	1.8	0.79	LV	ND	LV	ND	LV	ND	LV	ND	LV
19-Aug-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
26-Aug-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
03-Sep-96	0.00	122	55.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
09-Sep-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
16-Sep-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—

Appendix 1. Sampling date, rainfall amount, sample volume, and pesticide air concentration for each north and south sample taken at the Franklin Field Airport site, California—*Continued*

Date	Rainfall (inches)	Sample volume (m^3)		Chlorpyrifos (ng/m^3)		Diazinon (ng/m^3)		Malathion (ng/m^3)		Methidathion (ng/m^3)		Carbaryl (ng/m^3)	
		South	North	South	North	South	North	South	North	South	North	South	North
23-Sep-96	0.00	214	8.4	ND	LV	ND	LV	1.13	LV	ND	LV	ND	LV
30-Sep-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
08-Oct-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
15-Oct-96	0.00	72.6	114	ND	ND	5.34	ND	ND	ND	ND	ND	ND	ND
22-Oct-96	0.63	NST	NST	—	—	—	—	—	—	—	—	—	—
28-Oct-96	—	NST	NST	—	—	—	—	—	—	—	—	—	—
04-Nov-96	1.04	120	69.1	ND	ND	0.75	ND	ND	ND	ND	ND	ND	ND
13-Nov-96	—	TWS	TWS	—	—	—	—	—	—	—	—	—	—
19-Nov-96	0.74	64.5	49.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
26-Nov-96	0.08	NST	NST	—	—	—	—	—	—	—	—	—	—
02-Dec-96	0.77	33.3	23.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
09-Dec-96	1.66	NST	NST	—	—	—	—	—	—	—	—	—	—
16-Dec-96	1.98	182	4.0	ND	LV	4.13	LV	ND	LV	ND	LV	ND	LV
23-Dec-96	0.79	NST	NST	—	—	—	—	—	—	—	—	—	—
30-Dec-96	2.83	172	117	1.26	ND	1.55	ND	ND	ND	ND	ND	ND	ND
07-Jan-97	0.15	44.0	61.7	LV	ND	LV	ND	LV	ND	LV	ND	LV	ND
13-Jan-97	0.45	127	83.5	ND	ND	2.63	ND	ND	ND	ND	ND	ND	ND
21-Jan-97	4.03	146	48.5	5.57	1.17	18.5	1.59	ND	ND	ND	ND	ND	ND
28-Jan-97	0.01	56.9	57.2	ND	ND	0.68	ND	ND	ND	ND	ND	ND	ND
03-Feb-97	0.24	52.3	92.8	ND	ND	ND	0.25	ND	ND	ND	ND	ND	ND
10-Feb-97	0.01	56.4	127	ND	ND	ND	0.71	ND	ND	ND	ND	ND	ND
18-Feb-97	0.00	54.0	138	ND	ND	2.34	ND	ND	ND	ND	ND	ND	ND
24-Feb-97	0.05	84.7	111	ND	ND	2.27	ND	ND	ND	ND	ND	ND	ND
03-Mar-97	0.06	17.4	103	4.68	ND	ND	ND	ND	ND	ND	ND	ND	ND
10-Mar-97	0.33	66.8	69.2	6.81	1.19	2.18	ND	ND	ND	ND	ND	ND	ND
17-Mar-97	0.00	21.3	135	6.22	9.99	ND	ND	ND	ND	ND	ND	ND	ND
24-Mar-97	0.00	40.4	95.3	2.64	1.96	ND	ND	ND	ND	ND	ND	ND	ND
31-Mar-97	0.00	14.0	193	LV	0.21	LV	ND	LV	ND	LV	ND	LV	ND
07-Apr-97	0.00	30.4	99.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
14-Apr-97	0.26	60.3	15.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
21-Apr-97	0.03	49.3	62.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
28-Apr-97	0.00	45.2	34.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
05-May-97	0.00	32.5	13.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
12-May-97	0.00	48.4	52.8	0.51	1.26	ND	ND	ND	ND	ND	ND	ND	ND
20-May-97	0.29	72.2	12.9	0.48	ND	ND	ND	ND	ND	ND	ND	ND	ND
27-May-97	0.00	24.1	22.6	ND	6.42	ND	ND	ND	ND	ND	ND	ND	ND
02-June-97	0.23	28.3	41.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
10-June-97	0.07	55.7	36.6	0.68	ND	ND	ND	ND	ND	ND	ND	ND	ND

Appendix 1. Sampling date, rainfall amount, sample volume, and pesticide air concentration for each north and south sample taken at the Franklin Field Airport site, California—*Continued*

Date	Rainfall (inches)	Sample volume (m^3)		Chlorpyrifos (ng/m^3)		Diazinon (ng/m^3)		Malathion (ng/m^3)		Methidathion (ng/m^3)		Carbaryl (ng/m^3)	
		South	North	South	North	South	North	South	North	South	North	South	North
16-June-97	0.00	82.9	13.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
23-June-97	0.00	74.7	25.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
30-June-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
07-July-97	0.00	27.8	8.9	ND	ND	ND	ND	ND	ND	ND	ND	3.12	ND
14-July-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
21-July-97	0.00	39.7	17.1	—	—	—	—	—	—	—	—	—	—
28-July-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
04-Aug-97	0.00	14.6	31.4	2.71	ND	ND	ND	ND	ND	ND	ND	ND	ND
11-Aug-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
18-Aug-97	0.11	38.9	11.7	ND	3.95	ND	ND	ND	ND	ND	ND	ND	ND
25-Aug-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
02-Sep-97	0.00	43.6	20.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
08-Sep-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
15-Sep-97	0.00	28.9	103	3.37	0.90	5.63	ND	ND	ND	ND	ND	ND	ND
22-Sep-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
29-Sep-97	0.02	41.5	49.7	ND	ND	0.54	1.45	ND	ND	ND	ND	ND	ND
06-Oct-97	0.62	NST	NST	—	—	—	—	—	—	—	—	—	—
13-Oct-97	0.00	29.3	47.4	ND	ND	8.55	ND	ND	ND	ND	ND	ND	ND
20-Oct-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
27-Oct-97	0.00	54.8	51.5	—	—	—	—	—	—	—	—	—	—
03-Nov-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
10-Nov-97	0.52	157	9.2	0.22	ND	ND	ND	ND	ND	ND	ND	ND	ND
17-Nov-97	0.69	NST	NST	—	—	—	—	—	—	—	—	—	—
24-Nov-97	2.46	112	76.6	—	—	—	—	—	—	—	—	—	—
01-Dec-97	2.35	NST	NST	—	—	—	—	—	—	—	—	—	—
08-Dec-97	0.65	57.6	101	—	—	—	—	—	—	—	—	—	—
15-Dec-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
22-Dec-97	0.00	19.9	146	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
29-Dec-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—

Appendix 1. Sampling date, rainfall amount, sample volume, and pesticide air concentration for each north and south sample taken at the Franklin Field Airport site, California—*Continued*

Date	Rainfall (inches)	Sample volume (m^3)		Carbofuran (ng/m^3)		Chlorothalonil (ng/m^3)	
		South	North	South	North	South	North
02-Jan-96	—	TWS	TWS	—	—	—	—
09-Jan-96	0.90	176	64.3	ND	ND	ND	ND
16-Jan-96	0.75	144	43.1	ND	ND	ND	ND
22-Jan-96	1.82	176	64.3	ND	ND	ND	ND
29-Jan-96	2.12	102	125	ND	ND	ND	ND
05-Feb-96	0.01	37.5	46.1	LV	ND	LV	ND
12-Feb-96	1.41	154	17.3	ND	ND	ND	ND
19-Feb-96	0.94	135	10.6	ND	ND	ND	ND
26-Feb-96	0.66	199	30.3	ND	ND	ND	ND
04-Mar-96	0.49	51.3	76.7	ND	ND	ND	ND
11-Mar-96	1.17	51.6	66.8	ND	ND	ND	ND
18-Mar-96	0.00	101	27.8	ND	ND	ND	ND
25-Mar-96	0.08	76.5	33.6	ND	LV	ND	LV
01-Apr-96	1.32	44.0	38.2	—	LV	—	LV
08-Apr-96	0.00	34.1	48.8	—	LV	—	LV
15-Apr-96	0.81	109	23.8	ND	LV	ND	LV
22-Apr-96	0.00	27.7	142	ND	—	ND	—
29-Apr-96	0.00	97.6	80.5	ND	ND	ND	ND
06-May-96	0.00	89.4	36.1	ND	ND	ND	ND
13-May-96	1.52	108	27.0	ND	ND	ND	ND
20-May-96	0.05	69.8	152	ND	ND	ND	ND
29-May-96	0.00	NST	NST	—	—	—	—
03-June-96	0.00	NST	NST	—	—	—	—
10-June-96	0.00	30.1	8.0	0.33	LV	ND	LV
17-June-96	0.00	NST	NST	—	—	—	—
24-June-96	0.00	55.5	21.9	ND	ND	ND	ND
01-July-96	0.00	NST	NST	—	—	—	—
08-July-96	0.00	NST	NST	—	—	—	—
15-July-96	0.00	176	0.0	ND	LV	ND	LV
22-July-96	0.00	NST	NST	—	—	—	—
29-July-96	0.00	NST	NST	—	—	—	—
05-Aug-96	0.00	NST	NST	—	—	—	—
12-Aug-96	0.00	232	1.8	ND	LV	ND	LV
19-Aug-96	0.00	NST	NST	—	—	—	—
26-Aug-96	0.00	NST	NST	—	—	—	—
03-Sep-96	0.00	122	55.7	ND	ND	3.99	ND
09-Sep-96	0.00	NST	NST	—	—	—	—
16-Sep-96	0.00	NST	NST	—	—	—	—

Appendix 1. Sampling date, rainfall amount, sample volume, and pesticide air concentration for each north and south sample taken at the Franklin Field Airport site, California—*Continued*

Date	Rainfall (inches)	Sample volume (m^3)		Carbofuran (ng/m^3)		Chlorothalonil (ng/m^3)	
		South	North	South	North	South	North
23-Sep-96	0.00	214	8.4	ND	LV	2.63	LV
30-Sep-96	0.00	NST	NST	—	—	—	—
08-Oct-96	0.00	NST	NST	—	—	—	—
15-Oct-96	0.00	72.6	114	ND	ND	ND	ND
22-Oct-96	0.63	NST	NST	—	—	—	—
28-Oct-96	—	NST	NST	—	—	—	—
04-Nov-96	1.04	120	69.1	ND	ND	ND	ND
13-Nov-96	—	TWS	TWS	—	—	—	—
19-Nov-96	0.74	64.5	49.9	ND	ND	ND	ND
26-Nov-96	0.08	NST	NST	—	—	—	—
02-Dec-96	0.77	33.3	23.6	ND	ND	ND	ND
09-Dec-96	1.66	NST	NST	—	—	—	—
16-Dec-96	1.98	182	4.0	ND	—	ND	—
23-Dec-96	0.79	NST	NST	—	—	—	—
30-Dec-96	2.83	172	117	ND	ND	ND	ND
07-Jan-97	0.15	44.0	61.7	LV	ND	LV	ND
13-Jan-97	0.45	127	83.5	ND	ND	ND	ND
21-Jan-97	4.03	146	48.5	ND	ND	ND	ND
28-Jan-97	0.01	56.9	57.2	ND	ND	ND	ND
03-Feb-97	0.24	52.3	92.8	ND	ND	ND	ND
10-Feb-97	0.01	56.4	127	ND	ND	ND	ND
18-Feb-97	0.00	54.0	138	ND	ND	ND	ND
24-Feb-97	0.05	84.7	111	ND	ND	ND	ND
03-Mar-97	0.06	17.4	103	ND	ND	ND	ND
10-Mar-97	0.33	66.8	69.2	ND	ND	ND	ND
17-Mar-97	0.00	21.3	135	ND	ND	ND	ND
24-Mar-97	0.00	40.4	95.3	ND	ND	ND	ND
31-Mar-97	0.00	14.0	193	LV	ND	LV	ND
07-Apr-97	0.00	30.4	99.7	ND	ND	ND	ND
14-Apr-97	0.26	60.3	15.5	ND	ND	ND	ND
21-Apr-97	0.03	49.3	62.0	ND	ND	ND	ND
28-Apr-97	0.00	45.2	34.5	ND	ND	ND	ND
05-May-97	0.00	32.5	13.0	ND	ND	ND	ND
12-May-97	0.00	48.4	52.8	ND	ND	ND	ND
20-May-97	0.29	72.2	12.9	ND	ND	ND	ND
27-May-97	0.00	24.1	22.6	ND	ND	ND	ND
02-June-97	0.23	28.3	41.1	ND	ND	ND	ND

Appendix 1. Sampling date, rainfall amount, sample volume, and pesticide air concentration for each north and south sample taken at the Franklin Field Airport site, California—*Continued*

Date	Rainfall (inches)	Sample volume (m^3)		Carbofuran (ng/m^3)		Chlorothalonil (ng/m^3)	
		South	North	South	North	South	North
10-June-97	0.07	55.7	36.6	ND	ND	ND	ND
16-June-97	0.00	82.9	13.8	ND	ND	ND	ND
23-June-97	0.00	74.7	25.4	ND	ND	ND	ND
30-June-97	0.00	NST	NST	—	—	—	—
07-July-97	0.00	27.8	8.9	ND	ND	ND	ND
14-July-97	0.00	NST	NST	—	—	—	—
21-July-97	0.00	39.7	17.1	—	—	—	—
28-July-97	0.00	NST	NST	—	—	—	—
04-Aug-97	0.00	14.6	31.4	ND	ND	76.4	15.6
11-Aug-97	0.00	NST	NST	—	—	—	—
18-Aug-97	0.11	38.9	11.7	ND	ND	1.17	30.9
25-Aug-97	0.00	NST	NST	—	—	—	—
02-Sep-97	0.00	43.6	20.0	ND	ND	2.08	ND
08-Sep-97	0.00	NST	NST	—	—	—	—
15-Sep-97	0.00	28.9	103	ND	ND	ND	ND
22-Sep-97	0.00	NST	NST	—	—	—	—
29-Sep-97	0.02	41.5	49.7	ND	ND	2.22	ND
06-Oct-97	0.62	NST	NST	—	—	—	—
13-Oct-97	0.00	29.3	47.4	ND	ND	ND	ND
20-Oct-97	0.00	NST	NST	—	—	—	—
27-Oct-97	0.00	54.8	51.5	—	—	—	—
03-Nov-97	0.00	NST	NST	—	—	—	—
10-Nov-97	0.52	157	9.2	ND	ND	ND	ND
17-Nov-97	0.69	NST	NST	—	—	—	—
24-Nov-97	2.46	112	76.6	—	—	—	—
01-Dec-97	2.35	NST	NST	—	—	—	—
08-Dec-97	0.65	57.6	101	—	—	—	—
15-Dec-97	0.00	NST	NST	—	—	—	—
22-Dec-97	0.00	19.9	146	ND	ND	ND	ND
29-Dec-97	0.00	NST	NST	—	—	—	—

Appendix 2. Sampling date, rainfall amount, sample volume, and pesticide air concentration for each north and south sample taken at the Sacramento Metropolitan area site, California

[Pesticides air concentrations are in nanogram per cubic meter (ng/m^3). LV, sample not analyzed because of low air volume; ND, not detected; NI, directional sampling not installed; NST, no sample taken; TWS, a 2-week sample; *, composite sample, no directional component; —, no data available; m^3, cubic meter]

Date	Rainfall (inches)	Sample volume (m^3)		EPTC (ng/m^3)		Molinate (ng/m^3)		Thiobencarb (ng/m^3)		Trifluralin (ng/m^3)		Atrazine (ng/m^3)	
		South	North	South	North	South	North	South	North	South	North	South	North
02-Jan-96	NST	*180	NI	ND	NI	ND	NI	ND	NI	*1.64	NI	ND	NI
09-Jan-96	NST	*179	NI	ND	NI	ND	NI	ND	NI	*0.34	NI	ND	NI
16-Jan-96	NST	*170	NI	ND	NI	ND	NI	ND	NI	*1.48	NI	ND	NI
22-Jan-96	NST	*173	NI	ND	NI	ND	NI	ND	NI	*1.78	NI	ND	NI
29-Jan-96	NST	*175	NI	ND	NI	ND	NI	ND	NI	*2.35	NI	ND	NI
05-Feb-96	0.00	*73	NI	Sample lost	NI	—	NI	—	NI	—	NI	—	NI
13-Feb-96	2.34	153	12.8	ND	LV	ND	LV	ND	LV	4.08	LV	ND	LV
20-Feb-96	1.42	162	27.1	ND	LV	ND	LV	ND	LV	4.76	LV	ND	LV
27-Feb-96	1.00	174	33.4	ND	LV	ND	LV	ND	LV	1.30	LV	ND	LV
04-Mar-96	0.39	114	62.9	ND	ND	ND	ND	ND	ND	3.48	ND	ND	ND
11-Mar-96	1.24	41.9	114	LV	ND	LV	ND	LV	ND	LV	0.91	LV	ND
18-Mar-96	0.00	146	33.4	ND	LV	ND	LV	ND	LV	2.00	LV	ND	LV
25-Mar-96	0.08	157	37.5	ND	LV	ND	LV	ND	LV	1.83	LV	ND	LV
01-Apr-96	0.92	56.6	58.6	ND	ND	ND	ND	ND	ND	3.74	43.0	ND	ND
08-Apr-96	0.00	132	35.0	ND	LV	ND	LV	ND	LV	1.79	LV	ND	LV
15-Apr-96	0.74	156	30.4	ND	ND	ND	ND	ND	ND	2.19	0.41	ND	ND
22-Apr-96	0.00	77.4	177	ND	ND	ND	ND	ND	3.46	3.12	4.92	ND	ND
29-Apr-96	0.00	120	76.7	Sample lost	ND	—	ND	—	ND	—	0.56	—	ND
06-May-96	0.00	185	25.8	ND	ND	ND	ND	ND	1.55	1.46	ND	ND	ND
13-May-96	2.06	216	20.1	0.34	ND	ND	15.8	ND	8.38	8.48	ND	ND	1.82
20-May-96	0.17	215	168	ND	ND	1.66	15.8	1.27	40.5	3.47	1.82	ND	ND
29-May-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
03-June-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
10-June-96	0.00	289	7.9	1.52	LV	ND	LV	ND	LV	ND	LV	ND	LV
17-June-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
24-June-96	0.00	137	21.4	ND	ND	ND	ND	ND	ND	1.80	ND	ND	ND
01-July-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
08-July-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
15-July-96	0.00	161	48	ND	ND	ND	ND	ND	ND	1.30	ND	ND	ND
22-July-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
29-July-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
05-Aug-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
12-Aug-96	0.00	222	3.3	ND	LV	ND	LV	ND	LV	ND	LV	ND	LV
19-Aug-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—

Appendix 2. Sampling date, rainfall amount, sample volume, and pesticide air concentration for each north and south sample taken at the Franklin Field Airport site, California—*Continued*

Date	Rainfall (inches)	Sample volume (m^3)		EPTC (ng/m^3)		Molinate (ng/m^3)		Thiobencarb (ng/m^3)		Trifluralin (ng/m^3)		Atrazine (ng/m^3)	
		South	North	South	North	South	North	South	North	South	North	South	North
26-Aug-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
03-Sep-96	0.00	83.2	45.7	ND	LV	ND	LV	ND	LV	ND	LV	ND	LV
09-Sep-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
16-Sep-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
23-Sep-96	0.00	152	11.1	ND	LV	ND	LV	ND	LV	ND	LV	ND	LV
30-Sep-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
08-Oct-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
15-Oct-96	0.11	45.5	114	ND	ND	ND	ND	ND	ND	ND	2.22	ND	ND
22-Oct-96	0.65	NST	NST	—	—	—	—	—	—	—	—	—	—
28-Oct-96	—	NST	NST	—	—	—	—	—	—	—	—	—	—
04-Nov-96	0.97	149	105	ND	ND	ND	ND	ND	ND	10.3	ND	ND	ND
13-Nov-96	—	TWS	NST	—	—	—	—	—	—	—	—	—	—
19-Nov-96	0.70	109	84.4	ND	ND	ND	ND	ND	ND	ND	5.67	ND	ND
26-Nov-96	0.12	NST	NST	—	—	—	—	—	—	—	—	—	—
02-Dec-96	0.67	189	22.0	ND	ND	ND	ND	ND	ND	1.42	ND	ND	ND
09-Dec-96	1.60	NST	NST	—	—	—	—	—	—	—	—	—	—
16-Dec-96	2.03	170	12.5	ND	ND	ND	ND	ND	ND	1.76	ND	ND	ND
23-Dec-96	1.83	NST	NST	—	—	—	—	—	—	—	—	—	—
30-Dec-96	2.84	28.8	76.1	ND	ND	ND	ND	ND	ND	3.78	0.95	ND	ND
07-Jan-97	0.20	35.2	95.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
13-Jan-97	0.89	97.0	108	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
21-Jan-97	5.09	152	55.2	ND	ND	ND	ND	ND	ND	1.50	ND	ND	ND
28-Jan-97	0.00	51.1	54.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
03-Feb-97	0.19	37.1	114	ND	ND	ND	ND	ND	ND	ND	0.17	ND	ND
10-Feb-97	0.04	76.7	136	ND	ND	ND	ND	ND	ND	1.69	0.93	ND	ND
18-Feb-97	0.00	57.6	156	ND	ND	ND	ND	ND	ND	ND	1.18	ND	ND
24-Feb-97	0.05	115	124	ND	ND	ND	ND	ND	ND	1.49	ND	ND	ND
03-Mar-97	0.05	20.1	113	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
10-Mar-97	0.45	113	67.8	ND	ND	ND	ND	ND	ND	5.74	ND	ND	ND
17-Mar-97	0.00	45.3	122	ND	ND	ND	ND	ND	ND	4.47	4.72	ND	ND
24-Mar-97	0.00	106	107	ND	0.19	ND	ND	ND	ND	1.99	2.45	ND	ND
31-Mar-97	0.00	49.6	217	ND	ND	ND	ND	ND	ND	ND	2.31	ND	ND
07-Apr-97	0.00	91.4	120	ND	ND	ND	ND	ND	ND	2.42	2.55	ND	ND
14-Apr-97	0.15	210	8.6	ND	LV	ND	LV	ND	LV	3.67	LV	ND	LV
21-Apr-97	0.19	163	91.4	ND	ND	ND	ND	ND	ND	1.94	0.44	ND	ND
28-Apr-97	0.00	144	35.6	ND	ND	ND	17.4	ND	ND	ND	ND	ND	ND
05-May-97	0.00	204	19.8	ND	ND	ND	22.4	0.39	ND	1.83	ND	ND	ND
12-May-97	0.00	175	58.4	ND	ND	ND	5.23	88.3	ND	2.06	ND	ND	ND
20-May-97	0.31	195	22.8	ND	ND	ND	7.56	ND	ND	1.34	ND	ND	ND

Appendix 2. Sampling date, rainfall amount, sample volume, and pesticide air concentration for each north and south sample taken at the Franklin Field Airport site, California—*Continued*

Date	Rainfall (inches)	Sample volume (m^3)		EPTC (ng/m^3)		Molinate (ng/m^3)		Thiobencarb (ng/m^3)		Trifluralin (ng/m^3)		Atrazine (ng/m^3)	
		South	North	South	North	South	North	South	North	South	North	South	North
27-May-97	0.00	124	28.1	ND	ND	ND	7.22	ND	8.29	3.09	0.32	ND	ND
02-June-97	0.14	217	54.9	ND	ND	ND	5.18	ND	13.6	0.50	3.51	ND	ND
10-June-97	0.45	227	41.3	ND	ND	ND	10.8	ND	ND	0.99	13.0	ND	ND
16-June-97	0.00	257	7.0	ND	ND	ND	26.6	ND	ND	0.99	ND	ND	ND
23-June-97	0.00	219	41.5	ND	ND	ND	ND	ND	ND	0.08	ND	ND	ND
30-June-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
07-July-97	0.00	217	24.0	ND	ND	ND	ND	ND	ND	0.46	ND	ND	ND
14-July-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
21-July-97	0.00	256	17.1	Samples lost		—	—	—	—	—	—	—	—
28-July-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
04-Aug-97	0.00	170	31.8	ND	ND	ND	ND	ND	ND	0.67	ND	ND	ND
11-Aug-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
18-Aug-97	0.18	203	150	ND	ND	ND	ND	ND	ND	0.71	0.17	ND	ND
25-Aug-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
02-Sep-97	0.00	154	20.9	ND	ND	ND	ND	ND	ND	0.16	ND	ND	ND
08-Sep-97	0.15	NST	NST	—	—	—	—	—	—	—	—	—	—
15-Sep-97	0.00	66.7	140	ND	ND	ND	ND	ND	ND	ND	0.94	ND	ND
22-Sep-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
29-Sep-97	0.11	140	59.3	ND	ND	ND	ND	ND	ND	0.31	ND	ND	ND
06-Oct-97	0.90	NST	NST	—	—	—	—	—	—	—	—	—	—
13-Oct-97	0.00	44.7	23.7	ND	ND	ND	ND	ND	ND	0.65	ND	ND	ND
20-Oct-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
27-Oct-97	0.00	68.9	65.5	Samples lost		—	—	—	—	—	—	—	—
03-Nov-97	0.12	NST	NST	—	—	—	—	—	—	—	—	—	—
10-Nov-97	1.84	119	6.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
17-Nov-97	0.18	NST	NST	—	—	—	—	—	—	—	—	—	—
24-Nov-97	1.59	89.4	80.7	ND	ND	ND	ND	ND	ND	1.79	0.91	ND	ND
01-Dec-97	1.87	NST	NST	—	—	—	—	—	—	—	—	—	—
08-Dec-97	0.89	57.6	101	Samples lost		—	—	—	—	—	—	—	—
15-Dec-97	0.01	NST	NST	—	—	—	—	—	—	—	—	—	—
22-Dec-97	0.00	14.6	161	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
29-Dec-97	—	NST	NST	—	—	—	—	—	—	—	—	—	—

Appendix 2. Sampling date, rainfall amount, sample volume, and pesticide air concentration for each north and south sample taken at the Franklin Field Airport site, California—*Continued*

Date	Rainfall (inches)	Sample volume (m^3)		Simazine (ng/m^3)		Alachlor (ng/m^3)		Metolachlor (ng/m^3)		Dacthal (ng/m^3)		Pendimethalin (ng/m^3)	
		South	North	South	North	South	North	South	North	South	North	South	North
02-Jan-96	NST	*180	NI	ND	NI	ND	NI	ND	NI	ND	NI	ND	NI
09-Jan-96	NST	*179	NI	ND	NI	ND	NI	ND	NI	ND	NI	ND	NI
16-Jan-96	NST	*170	NI	ND	NI	ND	NI	ND	NI	ND	NI	ND	NI
22-Jan-96	NST	*173	NI	ND	NI	ND	NI	ND	NI	ND	NI	*0.36	NI
29-Jan-96	NST	*175	NI	ND	NI	ND	NI	ND	NI	ND	NI	*0.22	NI
05-Feb-96	0.00	*73	NI	—	NI	—	NI	—	NI	—	NI	—	NI
13-Feb-96	2.34	153	12.8	ND	LV	ND	LV	ND	LV	ND	LV	ND	LV
20-Feb-96	1.42	162	27.1	ND	LV	ND	LV	ND	LV	ND	LV	ND	LV
27-Feb-96	1.00	174	33.4	ND	LV	ND	LV	ND	LV	0.24	LV	ND	LV
04-Mar-96	0.39	114	62.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
11-Mar-96	1.24	41.9	114	LV	ND	LV	ND	LV	ND	LV	ND	LV	ND
18-Mar-96	0.00	146	33.4	ND	LV	ND	LV	ND	LV	ND	LV	0.43	LV
25-Mar-96	0.08	157	37.5	ND	LV	ND	LV	ND	LV	ND	LV	0.36	LV
01-Apr-96	0.92	56.6	58.6	ND	ND	ND	ND	ND	0.08	ND	ND	0.58	0.95
08-Apr-96	0.00	132	35.0	0.25	LV	ND	LV	ND	LV	ND	LV	ND	LV
15-Apr-96	0.74	156	30.4	ND	ND	ND	ND	ND	ND	ND	ND	0.31	ND
22-Apr-96	0.00	77.4	177	ND	ND	ND	ND	ND		0.16	ND	ND	0.88
29-Apr-96	0.00	120	76.7	—	ND	—	ND	—	ND	—	ND	—	ND
06-May-96	0.00	185	25.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
13-May-96	2.06	216	20.1	ND	ND	ND	ND	0.60	ND	ND	ND	ND	ND
20-May-96	0.17	215	168	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
29-May-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
03-June-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
10-June-96	0.00	289	7.9	ND	LV	ND	LV	ND	LV	ND	LV	ND	LV
17-June-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
24-June-96	0.00	137	21.4	ND	ND	ND	ND	ND	ND	ND	0.33	ND	ND
01-July-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
08-July-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
15-July-96	0.00	161	48	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
22-July-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
29-July-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
05-Aug-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
12-Aug-96	0.00	222	3.3	ND	LV	ND	LV	ND	LV	ND	LV	ND	LV
19-Aug-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
26-Aug-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
03-Sep-96	0.00	83.2	45.7	ND	LV	ND	LV	ND	LV	ND	LV	ND	LV
09-Sep-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
16-Sep-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
23-Sep-96	0.00	152	11.1	ND	LV	ND	LV	ND	LV	ND	LV	ND	LV

Appendix 2. Sampling date, rainfall amount, sample volume, and pesticide air concentration for each north and south sample taken at the Franklin Field Airport site, California—*Continued*

Date	Rainfall (inches)	Sample volume (m^3)		Simazine (ng/m^3)		Alachlor (ng/m^3)		Metolachlor (ng/m^3)		Dacthal (ng/m^3)		Pendimethalin (ng/m^3)	
		South	North	South	North	South	North	South	North	South	North	South	North
30-Sep-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
08-Oct-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
15-Oct-96	0.11	45.5	114	ND	ND	ND	0.17	ND	ND	ND	ND	ND	ND
22-Oct-96	0.65	NST	NST	—	—	—	—	—	—	—	—	—	—
28-Oct-96	—	NST	NST	—	—	—	—	—	—	—	—	—	—
04-Nov-96	0.97	149	105	ND	ND	ND	ND	ND	ND	ND	ND	20.4	ND
13-Nov-96	—	TWS	NST	—	—	—	—	—	—	—	—	—	—
19-Nov-96	0.70	109	84.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
26-Nov-96	0.12	NST	NST	—	—	—	—	—	—	—	—	—	—
02-Dec-96	0.67	189	22.0	ND	ND	ND	ND	ND	ND	ND	ND	2.70	ND
09-Dec-96	1.60	NST	NST	—	—	—	—	—	—	—	—	—	—
16-Dec-96	2.03	170	12.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
23-Dec-96	1.83	NST	NST	—	—	—	—	—	—	—	—	—	—
30-Dec-96	2.84	28.8	76.1	ND	ND	ND	ND	ND	ND	ND	ND	6.55	ND
07-Jan-97	0.20	35.2	95.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
13-Jan-97	0.89	97.0	108	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
21-Jan-97	5.09	152	55.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
28-Jan-97	0.00	51.1	54.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
03-Feb-97	0.19	37.1	114	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
10-Feb-97	0.04	76.7	136	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
18-Feb-97	0.00	57.6	156	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
24-Feb-97	0.05	115	124	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
03-Mar-97	0.05	20.1	113	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
10-Mar-97	0.45	113	67.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
17-Mar-97	0.00	45.3	122	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
24-Mar-97	0.00	106	107	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
31-Mar-97	0.00	49.6	217	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07-Apr-97	0.00	91.4	120	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
14-Apr-97	0.15	210	8.6	ND	LV	ND	LV	ND	LV	ND	LV	ND	LV
21-Apr-97	0.19	163	91.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
28-Apr-97	0.00	144	35.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
05-May-97	0.00	204	19.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
12-May-97	0.00	175	58.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
20-May-97	0.31	195	22.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
27-May-97	0.00	124	28.1	ND	ND	ND	0.61	ND	ND	0.08	ND	ND	ND
02-June-97	0.14	217	54.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
10-June-97	0.45	227	41.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
16-June-97	0.00	257	7.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Appendix 2. Sampling date, rainfall amount, sample volume, and pesticide air concentration for each north and south sample taken at the Franklin Field Airport site, California—*Continued*

Date	Rainfall (inches)	Sample volume (m^3)		Simazine (ng/m^3)		Alachlor (ng/m^3)		Metolachlor (ng/m^3)		Dacthal (ng/m^3)		Pendimethalin (ng/m^3)	
		South	North	South	North	South	North	South	North	South	North	South	North
23-June-97	0.00	219	41.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
30-June-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
07-July-97	0.00	217	24.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
14-July-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
21-July-97	0.00	256	17.1	—	—	—	—	—	—	—	—	—	—
28-July-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
04-Aug-97	0.00	170	31.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
11-Aug-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
18-Aug-97	0.18	203	150	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
25-Aug-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
02-Sep-97	0.00	154	20.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
08-Sep-97	0.15	NST	NST	—	—	—	—	—	—	—	—	—	—
15-Sep-97	0.00	66.7	140	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
22-Sep-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
29-Sep-97	0.11	140	59.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
06-Oct-97	0.90	NST	NST	—	—	—	—	—	—	—	—	—	—
13-Oct-97	0.00	44.7	23.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
20-Oct-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
27-Oct-97	0.00	68.9	65.5	—	—	—	—	—	—	—	—	—	—
03-Nov-97	0.12	NST	NST	—	—	—	—	—	—	—	—	—	—
10-Nov-97	1.84	119	6.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
17-Nov-97	0.18	NST	NST	—	—	—	—	—	—	—	—	—	—
24-Nov-97	1.59	89.4	80.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.71
01-Dec-97	1.87	NST	NST	—	—	—	—	—	—	—	—	—	—
08-Dec-97	0.89	57.6	101	—	—	—	—	—	—	—	—	—	—
15-Dec-97	0.01	NST	NST	—	—	—	—	—	—	—	—	—	—
22-Dec-97	0.00	14.6	161	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
29-Dec-97	—	NST	NST	—	—	—	—	—	—	—	—	—	—

Appendix 2. Sampling date, rainfall amount, sample volume, and pesticide air concentration for each north and south sample taken at the Franklin Field Airport site, California—*Continued*

Date	Rainfall (inches)	Sample volume (m^3)		Diazinon (ng/m^3)		Chlorpyrifos (ng/m^3)		Malathion (ng/m^3)		Methidathion (ng/m^3)		Carbaryl (ng/m^3)	
		South	North	South	North	South	North	South	North	South	North	South	North
02-Jan-96	NST	*180	NI	*2.38	NI	ND	NI	ND	NI	ND	NI	ND	NI
09-Jan-96	NST	*179	NI	*10.5	NI	*3.55	NI	ND	NI	ND	NI	ND	NI
16-Jan-96	NST	*170	NI	*4.72	NI	*0.79	NI	*0.85	NI	ND	NI	ND	NI
22-Jan-96	NST	*173	NI	*3.66	NI	ND	NI	ND	NI	ND	NI	ND	NI
29-Jan-96	NST	*175	NI	*7.13	NI	*1.12	NI	ND	NI	ND	NI	ND	NI
05-Feb-96	0.00	*73	NI	—	NI	—	NI	—	NI	—	NI	—	NI
13-Feb-96	2.34	153	12.8	2.36	LV	ND	LV	ND	LV	ND	LV	ND	LV
20-Feb-96	1.42	162	27.1	1.31	LV	ND	LV	ND	LV	ND	LV	ND	LV
27-Feb-96	1.00	174	33.4	1.07	LV	3.76	LV	ND	LV	ND	LV	ND	LV
04-Mar-96	0.39	114	62.9	0.10	0.75	ND	ND	ND	ND	ND	ND	ND	ND
11-Mar-96	1.24	41.9	114	LV		LV	ND	LV	ND	LV	ND	LV	ND
18-Mar-96	0.00	146	33.4	1.42	LV	ND	LV	ND	LV	ND	LV	ND	LV
25-Mar-96	0.08	157	37.5	1.91	LV	ND	LV	ND	LV	ND	LV	ND	LV
01-Apr-96	0.92	56.6	58.6	4.47	18.6	ND	ND	ND	ND	ND	ND	ND	ND
08-Apr-96	0.00	132	35.0	2.71	LV	ND	LV	ND	LV	ND	LV	ND	LV
15-Apr-96	0.74	156	30.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
22-Apr-96	0.00	77.4	177	1.71	ND	7.20	ND	ND		ND		ND	ND
29-Apr-96	0.00	120	76.7	—	0.87	—	3.73	—	ND	—	ND	—	ND
06-May-96	0.00	185	25.8	ND	ND	0.79	ND	ND	ND	ND	ND	1.57	ND
13-May-96	2.06	216	20.1	6.23	ND	2.12	ND	ND	ND	ND	ND	ND	ND
20-May-96	0.17	215	168	1.12	0.88	1.08	2.29	ND	ND	ND	ND	ND	ND
29-May-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
03-June-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
10-June-96	0.00	289	7.9	18.7	LV	12.3	LV	ND	LV	ND	LV	ND	LV
17-June-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
24-June-96	0.00	137	21.4	ND	ND	0.99	ND	ND	ND	ND	ND	ND	ND
01-July-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
08-July-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
15-July-96	0.00	161	48	1.83	ND	2.46	ND	ND	ND	ND	ND	ND	ND
22-July-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
29-July-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
05-Aug-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
12-Aug-96	0.00	222	3.3	ND	LV	ND	LV	ND	LV	ND	LV	ND	LV
19-Aug-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
26-Aug-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
03-Sep-96	0.00	83.2	45.7	11.3	LV	1.29	LV	ND	LV	ND	LV	ND	LV
09-Sep-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
16-Sep-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—

Appendix 2. Sampling date, rainfall amount, sample volume, and pesticide air concentration for each north and south sample taken at the Franklin Field Airport site, California—*Continued*

Date	Rainfall (inches)	Sample volume (m^3)		Diazinon (ng/m^3)		Chlorpyrifos (ng/m^3)		Malathion (ng/m^3)		Methidathion (ng/m^3)		Carbaryl (ng/m^3)	
		South	North	South	North	South	North	South	North	South	North	South	North
23-Sep-96	0.00	152	11.1	1.71	LV	1.98	LV	ND	LV	ND	LV	ND	LV
30-Sep-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
08-Oct-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
15-Oct-96	0.11	45.5	114	5.75	ND	2.78	ND	ND	ND	ND	ND	ND	ND
22-Oct-96	0.65	NST	NST	—	—	—	—	—	—	—	—	—	—
28-Oct-96	—	NST	NST	—	—	—	—	—	—	—	—	—	—
04-Nov-96	0.97	149	105	1.13	ND	2.60	ND	ND	ND	ND	ND	ND	ND
13-Nov-96	—	TWS	NST	—	—	—	—	—	—	—	—	—	—
19-Nov-96	0.70	109	84.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
26-Nov-96	0.12	NST	NST	—	—	—	—	—	—	—	—	—	—
02-Dec-96	0.67	189	22.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
09-Dec-96	1.60	NST	NST	—	—	—	—	—	—	—	—	—	—
16-Dec-96	2.03	170	12.5	0.88	ND	1.02	ND	ND	ND	ND	ND	ND	ND
23-Dec-96	1.83	NST	NST	—	—	—	—	—	—	—	—	—	—
30-Dec-96	2.84	28.8	76.1	0.92	0.40	2.41	ND	ND	ND	ND	ND	ND	ND
07-Jan-97	0.20	35.2	95.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
13-Jan-97	0.89	97.0	108	2.52	6.06	8.55	ND	ND	ND	ND	ND	ND	ND
21-Jan-97	5.09	152	55.2	4.37	ND	5.44	ND	ND	ND	ND	ND	ND	ND
28-Jan-97	0.00	51.1	54.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
03-Feb-97	0.19	37.1	114	1.49	0.90	ND	ND	ND	ND	ND	ND	ND	ND
10-Feb-97	0.04	76.7	136	ND	2.04	ND	ND	ND	ND	ND	ND	ND	ND
18-Feb-97	0.00	57.6	156	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
24-Feb-97	0.05	115	124	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
03-Mar-97	0.05	20.1	113	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
10-Mar-97	0.45	113	67.8	ND	ND	6.53	ND	ND	ND	ND	ND	ND	ND
17-Mar-97	0.00	45.3	122	ND	1.97	2.58	1.89	ND	ND	ND	ND	ND	ND
24-Mar-97	0.00	106	107	5.41	2.68	1.68	1.23	1.58	3.77	ND	ND	ND	ND
31-Mar-97	0.00	49.6	217	ND	5.94	ND	ND	ND	ND	ND	ND	ND	ND
07-Apr-97	0.00	91.4	120	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
14-Apr-97	0.15	210	8.6	1.29	LV	ND	LV	ND	LV	ND	LV	ND	LV
21-Apr-97	0.19	163	91.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
28-Apr-97	0.00	144	35.6	ND	ND	ND	ND	1.89	ND	ND	ND	ND	ND
05-May-97	0.00	204	19.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
12-May-97	0.00	175	58.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
20-May-97	0.31	195	22.8	1.06	ND	ND	ND	ND	ND	ND	ND	ND	ND
27-May-97	0.00	124	28.1	ND	ND	1.55	ND	ND	ND	ND	ND	ND	ND
02-June-97	0.14	217	54.9	4.65	ND	ND	ND	ND	ND	ND	ND	ND	ND
10-June-97	0.45	227	41.3	ND	ND	0.55	ND	ND	ND	ND	ND	ND	ND

Appendix 2. Sampling date, rainfall amount, sample volume, and pesticide air concentration for each north and south sample taken at the Franklin Field Airport site, California—*Continued*

Date	Rainfall (inches)	Sample volume (m^3)		Diazinon (ng/m^3)		Chlorpyrifos (ng/m^3)		Malathion (ng/m^3)		Methidathion (ng/m^3)		Carbaryl (ng/m^3)	
		South	North	South	North	South	North	South	North	South	North	South	North
16-June-97	0.00	257	7.0	ND	ND	1.09	ND	ND	ND	ND	ND	ND	ND
23-June-97	0.00	219	41.5	ND	ND	0.09	5.34	ND	ND	ND	ND	ND	ND
30-June-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
07-July-97	0.00	217	24.0	ND	ND	0.71	ND	ND	ND	ND	ND	ND	ND
14-July-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
21-July-97	0.00	256	17.1	—	—	—	—	—	—	—	—	—	—
28-July-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
04-Aug-97	0.00	170	31.8	1.99	ND	0.01	ND	2.05	ND	ND	ND	ND	ND
11-Aug-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
18-Aug-97	0.18	203	150	ND	ND	2.90	ND	ND	ND	ND	ND	ND	ND
25-Aug-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
02-Sep-97	0.00	154	20.9	1.91	ND	1.76	1.04	ND	ND	ND	ND	ND	ND
08-Sep-97	0.15	NST	NST	—	—	—	—	—	—	—	—	—	—
15-Sep-97	0.00	66.7	140	ND	ND	0.66	0.81	ND	ND	ND	ND	ND	0.98
22-Sep-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
29-Sep-97	0.11	140	59.3	ND	ND	0.88	ND	ND	ND	ND	ND	ND	ND
06-Oct-97	0.90	NST	NST	—	—	—	—	—	—	—	—	—	—
13-Oct-97	0.00	44.7	23.7	0.92	2.54	ND	ND	ND	ND	ND	ND	ND	ND
20-Oct-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
27-Oct-97	0.00	68.9	65.5	—	—	—	—	—	—	—	—	—	—
03-Nov-97	0.12	NST	NST	—	—	—	—	—	—	—	—	—	—
10-Nov-97	1.84	119	6.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
17-Nov-97	0.18	NST	NST	—	—	—	—	—	—	—	—	—	—
24-Nov-97	1.59	89.4	80.7	0.69	ND	1.27	ND	ND	ND	ND	ND	ND	ND
01-Dec-97	1.87	NST	NST	—	—	—	—	—	—	—	—	—	—
08-Dec-97	0.89	57.6	101	—	—	—	—	—	—	—	—	—	—
15-Dec-97	0.01	NST	NST	—	—	—	—	—	—	—	—	—	—
22-Dec-97	0.00	14.6	161	ND	0.49	ND	ND	ND	ND	ND	ND	ND	ND
29-Dec-97	—	NST	NST	—	—	—	—	—	—	—	—	—	—

Appendix 2. Sampling date, rainfall amount, sample volume, and pesticide air concentration for each north and south sample taken at the Franklin Field Airport site, California—*Continued*

Date	Rainfall (inches)	Sample volume (m^3)		Carbofuran (ng/m^3)		Chlorothalonil (ng/m^3)	
		South	North	South	North	South	North
02-Jan-96	NST	*180	NI	ND	NI	ND	NI
09-Jan-96	NST	*179	NI	ND	NI	ND	NI
16-Jan-96	NST	*170	NI	ND	NI	ND	NI
22-Jan-96	NST	*173	NI	ND	NI	ND	NI
29-Jan-96	NST	*175	NI	ND	NI	ND	NI
05-Feb-96	0.00	*73	NI	—	NI	—	NI
13-Feb-96	2.34	153	12.8	ND	LV	ND	LV
20-Feb-96	1.42	162	27.1	ND	LV	ND	LV
27-Feb-96	1.00	174	33.4	ND	LV	ND	LV
04-Mar-96	0.39	114	62.9	ND	ND	ND	ND
11-Mar-96	1.24	41.9	114	LV	ND	LV	ND
18-Mar-96	0.00	146	33.4	ND	LV	ND	LV
25-Mar-96	0.08	157	37.5	ND	LV	ND	LV
01-Apr-96	0.92	56.6	58.6	ND	ND	ND	ND
08-Apr-96	0.00	132	35.0	ND	LV	ND	LV
15-Apr-96	0.74	156	30.4	ND	ND	ND	ND
22-Apr-96	0.00	77.4	177	ND	ND	ND	
29-Apr-96	0.00	120	76.7	—	ND	—	ND
06-May-96	0.00	185	25.8	ND	ND	ND	ND
13-May-96	2.06	216	20.1	ND	ND	ND	ND
20-May-96	0.17	215	168	ND	ND	ND	ND
29-May-96	0.00	NST	NST	—	—	—	—
03-June-96	0.00	NST	NST	—	—	—	—
10-June-96	0.00	289	7.9	ND	LV	ND	LV
17-June-96	0.00	NST	NST	—	—	—	—
24-June-96	0.00	137	21.4	ND	ND	ND	ND
01-July-96	0.00	NST	NST	—	—	—	—
08-July-96	0.00	NST	NST	—	—	—	—
15-July-96	0.00	161	48	ND	ND	ND	ND
22-July-96	0.00	NST	NST	—	—	—	—
29-July-96	0.00	NST	NST	—	—	—	—
05-Aug-96	0.00	NST	NST	—	—	—	—
12-Aug-96	0.00	222	3.3	ND	LV	ND	LV
19-Aug-96	0.00	NST	NST	—	—	—	—
26-Aug-96	0.00	NST	NST	—	—	—	—
03-Sep-96	0.00	83.2	45.7	ND	LV	1.35	LV
09-Sep-96	0.00	NST	NST	—	—	—	—
16-Sep-96	0.00	NST	NST	—	—	—	—
23-Sep-96	0.00	152	11.1	ND	LV	1.97	LV

Appendix 2. Sampling date, rainfall amount, sample volume, and pesticide air concentration for each north and south sample taken at the Franklin Field Airport site, California—*Continued*

Date	Rainfall (inches)	Sample volume (m^3)		Carbofuran (ng/m^3)		Chlorothalonil (ng/m^3)	
		South	North	South	North	South	North
30-Sep-96	0.00	NST	NST	—	—	—	—
08-Oct-96	0.00	NST	NST	—	—	—	—
15-Oct-96	0.11	45.5	114	ND	ND	ND	ND
22-Oct-96	0.65	NST	NST	—	—	—	—
28-Oct-96	—	NST	NST	—	—	—	—
04-Nov-96	0.97	149	105	ND	ND	ND	ND
13-Nov-96	—	TWS	NST	—	—	—	—
19-Nov-96	0.70	109	84.4	ND	ND	ND	ND
26-Nov-96	0.12	NST	NST	—	—	—	—
02-Dec-96	0.67	189	22.0	ND	ND	ND	ND
09-Dec-96	1.60	NST	NST	—	—	—	—
16-Dec-96	2.03	170	12.5	ND	ND	ND	ND
23-Dec-96	1.83	NST	NST	—	—	—	—
30-Dec-96	2.84	28.8	76.1	ND	ND	ND	ND
07-Jan-97	0.20	35.2	95.6	ND	ND	ND	ND
13-Jan-97	0.89	97.0	108	ND	ND	ND	ND
21-Jan-97	5.09	152	55.2	ND	ND	ND	ND
28-Jan-97	0.00	51.1	54.8	ND	ND	ND	ND
03-Feb-97	0.19	37.1	114	ND	0.17	ND	ND
10-Feb-97	0.04	76.7	136	1.69	0.93	ND	ND
18-Feb-97	0.00	57.6	156	ND	1.18	ND	ND
24-Feb-97	0.05	115	124	1.49	ND	ND	ND
03-Mar-97	0.05	20.1	113	ND	ND	ND	ND
10-Mar-97	0.45	113	67.8	5.74	ND	ND	ND
17-Mar-97	0.00	45.3	122	4.47	4.72	ND	ND
24-Mar-97	0.00	106	107	1.99	2.45	ND	ND
31-Mar-97	0.00	49.6	217	ND	2.31	ND	ND
07-Apr-97	0.00	91.4	120	2.42	2.55	ND	ND
14-Apr-97	0.15	210	8.6	3.67	LV	ND	LV
21-Apr-97	0.19	163	91.4	1.94	0.44	ND	ND
28-Apr-97	0.00	144	35.6	ND	ND	ND	ND
05-May-97	0.00	204	19.8	1.83	ND	ND	ND
12-May-97	0.00	175	58.4	2.06	ND	ND	ND
20-May-97	0.31	195	22.8	1.34	ND	ND	ND
27-May-97	0.00	124	28.1	3.09	0.32	ND	ND
02-June-97	0.14	217	54.9	0.50	3.51	ND	ND
10-June-97	0.45	227	41.3	0.99	13.0	ND	ND
16-June-97	0.00	257	7.0	0.99	ND	ND	ND

Appendix 2. Sampling date, rainfall amount, sample volume, and pesticide air concentration for each north and south sample taken at the Franklin Field Airport site, California—*Continued*

Date	Rainfall (inches)	Sample volume (m^3)		Carbofuran (ng/m^3)		Chlorothalonil (ng/m^3)	
		South	North	South	North	South	North
23-June-97	0.00	219	41.5	0.08	ND	ND	ND
30-June-97	0.00	NST	NST	—	—	—	—
07-July-97	0.00	217	24.0	0.46	ND	ND	ND
14-July-97	0.00	NST	NST	—	—	—	—
21-July-97	0.00	256	17.1	—	—	—	—
28-July-97	0.00	NST	NST	—	—	—	—
04-Aug-97	0.00	170	31.8	0.67	ND	ND	7.86
11-Aug-97	0.00	NST	NST	—	—	—	—
18-Aug-97	0.18	203	150	0.71	0.17	3.01	10.2
25-Aug-97	0.00	NST	NST	—	—	—	—
02-Sep-97	0.00	154	20.9	0.16	ND	ND	5.63
08-Sep-97	0.15	NST	NST	—	—	—	—
15-Sep-97	0.00	66.7	140	ND	0.94	ND	2.58
22-Sep-97	0.00	NST	NST	—	—	—	—
29-Sep-97	0.11	140	59.3	0.31	ND	ND	ND
06-Oct-97	0.90	NST	NST	—	—	—	—
13-Oct-97	0.00	44.7	23.7	0.65	ND	ND	ND
20-Oct-97	0.00	NST	NST	—	—	—	—
27-Oct-97	0.00	68.9	65.5	—	—	—	—
03-Nov-97	0.12	NST	NST	—	—	—	—
10-Nov-97	1.84	119	6.8	ND	ND	ND	ND
17-Nov-97	0.18	NST	NST	—	—	—	—
24-Nov-97	1.59	89.4	80.7	1.79	0.91	ND	ND
01-Dec-97	1.87	NST	NST	—	—	—	—
08-Dec-97	0.89	57.6	101	—	—	—	—
15-Dec-97	0.01	NST	NST	—	—	—	—
22-Dec-97	0.00	14.6	161	ND	ND	ND	ND
29-Dec-97	—	NST	NST	—	—	—	—

Appendix 3. Sampling date, rainfall amount, sample volume, and pesticide air concentration for each north and south sample taken at the Sacramento International Airport site, California

[Pesticides air concentrations are in nanogram per cubic meter (ng/m^3). LV, sample not analyzed because of low air volume; ND, not detected; NST, no sample taken; TWS, a 2-week sample; —, no data available; m^3, cubic meter]

Date	Rainfall (inches)	Sample volume (m^3)		EPTC (ng/m^3)		Molinate (ng/m^3)		Thiobencarb (ng/m^3)		Trifluralin (ng/m^3)		Atrazine (ng/m^3)	
		South	North	South	North	South	North	South	North	South	North	South	North
02-Jan-96	—	TWS	TWS	—	—	—	—	—	—	—	—	—	—
09-Jan-96	0.70	207	86.5	ND	ND	ND	ND	ND	ND	0.66	1.59	ND	ND
16-Jan-96	0.79	167	77.8	ND	ND	ND	ND	ND	ND	5.72	0.52	ND	ND
22-Jan-96	1.39	173	41.3	ND	LV	ND	LV	ND	LV	2.20	LV	ND	LV
29-Jan-96	2.95	100	185	ND	ND	ND	ND	ND	ND	5.29	5.93	ND	ND
05-Feb-96	0.00	56.3	0.7	ND	LV	ND	LV	ND	LV	ND	LV	ND	LV
12-Feb-96	1.72	173	41.3	ND	LV	ND	LV	ND	LV	19.2	LV	ND	LV
19-Feb-96	0.80	165	39.5	ND	LV	ND	LV	ND	LV	0.24	LV	ND	LV
26-Feb-96	1.04	200	40.0	ND	LV	ND	LV	ND	LV	0.77	LV	ND	LV
04-Mar-96	0.52	147	90.4	ND	Sample lost	ND	—	ND	—	4.32	—	ND	—
11-Mar-96	0.98	59.5	138	ND	ND	ND	ND	ND	ND	3.27	1.30	ND	ND
18-Mar-96	0.00	158	59.0	ND	ND	ND	ND	ND	ND	2.36	0.81	ND	ND
25-Mar-96	0.17	184	41.2	ND	LV	ND	LV	ND	LV	1.83	LV	ND	LV
01-Apr-96	1.42	91.1	78.5	ND	ND	ND	ND	ND	ND	5.50	0.70	ND	ND
08-Apr-96	0.00	164	60.3	ND	Sample lost	ND	—		—	9.40	—	ND	—
15-Apr-96	0.86	204	41.4	Sample lost	ND	—	ND	—	ND	—	1.45	—	ND
22-Apr-96	0.00	78.8	194	ND	ND	ND	ND	ND	0.30	0.76	2.78	ND	ND
29-Apr-96	0.00	118	118	ND	ND	ND	ND	0.95	ND	1.08	0.35	ND	ND
06-May-96	0.00	163	33.9	ND	ND	6.17	23.7	2.15	7.99	0.02	ND	ND	ND
13-May-96	1.88	227	31.0	0.40	2.21	1.70	211	0.01	102	12.2	3.12	ND	ND
20-May-96	0.20	224	169	ND	ND	14.0	23.6	10.7	46.3	11.4	2.09	ND	ND
29-May-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
03-June-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
10-June-96	0.00	265	18.1	ND	ND	0.26	26.1	3.29	2.77	4.71	ND	ND	ND
17-June-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
24-June-96	0.00	147	37.9	ND	ND	5.77	23.1	ND	12.9	9.46	2.39	ND	ND
01-July-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
08-July-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
15-July-96	0.00	157	56.6	ND	ND	ND	ND	ND	ND	2.54	ND	ND	ND
22-July-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
29-July-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
05-Aug-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
12-Aug-96	0.00	220	23.3	ND	ND	ND	ND	ND	ND	10.2	ND	ND	ND

Appendix 3. Sampling date, rainfall amount, sample volume, and pesticide air concentration for each north and south sample taken at the Sacramento International Airport site, California—*Continued*

Date	Rainfall (inches)	Sample volume (m^3)		EPTC (ng/m^3)		Molinate (ng/m^3)		Thiobencarb (ng/m^3)		Trifluralin (ng/m^3)		Atrazine (ng/m^3)	
		South	North	South	North	South	North	South	North	South	North	South	North
19-Aug-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
26-Aug-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
03-Sep-96	0.00	74.7	60.4	ND	ND	ND	ND	ND	ND	3.71	ND	ND	ND
09-Sep-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
16-Sep-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
23-Sep-96	0.00	163	60.4	ND	ND	ND	ND	ND	ND	10.4	ND	ND	ND
30-Sep-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
08-Oct-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
15-Oct-96	0.08	47.8	180	ND	ND	ND	ND	ND	ND	ND	3.64	ND	ND
22-Oct-96	0.83	NST	NST	—	—	—	—	—	—	—	—	—	—
28-Oct-96	—	NST	NST	—	—	—	—	—	—	—	—	—	—
04-Nov-96	0.67	168	126	ND	ND	ND	ND	ND	ND	ND	4.41	ND	ND
13-Nov-96	—	TWS	TWS	—	—	—	—	—	—	—	—	—	—
19-Nov-96	0.57	119	94.1	ND	ND	ND	ND	ND	ND	12.7	12.9	ND	ND
26-Nov-96	0.12	NST	NST	—	—	—	—	—	—	—	—	—	—
02-Dec-96	0.68	257	27.0	ND	ND	ND	ND	ND	ND	3.75	2.10	ND	ND
09-Dec-96	1.22	NST	NST	—	—	—	—	—	—	—	—	—	—
16-Dec-96	1.62	182	29.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
23-Dec-96	1.61	NST	NST	—	—	—	—	—	—	—	—	—	—
30-Dec-96	2.33	117	98.5	ND	ND	ND	ND	ND	ND	10.0	1.92	ND	ND
07-Jan-97	0.18	46.3	129	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
13-Jan-97	0.80	127	138	ND	ND	ND	ND	ND	ND	1.29	5.11	ND	ND
21-Jan-97	4.36	171	79.2	ND	ND	ND	ND	ND	ND	2.60	0.92	ND	ND
28-Jan-97	0.01	53.0	62.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
03-Feb-97	0.13	46.5	125	ND	ND	ND	ND	ND	ND	ND	0.13	ND	ND
10-Feb-97	0.04	92.4	152	ND	ND	ND	ND	ND	ND	4.33	4.15	ND	ND
18-Feb-97	0.00	70.9	203	ND	ND	ND	ND	ND	ND	2.46	1.33	ND	ND
24-Feb-97	0.05	109	104	ND	ND	ND	ND	ND	ND	4.08	0.71	ND	ND
03-Mar-97	0.05	36.5	146	ND	ND	ND	ND	ND	ND	2.95	0.85	ND	ND
10-Mar-97	0.43	147	75.0	ND	ND	ND	ND	ND	ND	8.95	0.95	ND	ND
17-Mar-97	0.00	36.9	144	ND	ND	ND	ND	ND	ND	7.01	6.92	ND	ND
24-Mar-97	0.43	113	115	ND	0.30	ND	ND	ND	ND	2.61	3.13	ND	ND
31-Mar-97	0.00	57.4	226	ND	ND	ND	ND	ND	ND	2.27	1.47	ND	ND
07-Apr-97	0.00	85.0	159	ND	ND	ND	ND	ND	ND	3.76	3.95	ND	ND
14-Apr-97	0.29	241	19.5	ND	ND	ND	ND	ND	ND	7.59	1.07	ND	ND
21-Apr-97	0.00	158	117	ND	ND	ND	ND	ND	ND	4.11	1.97	ND	ND
28-Apr-97	0.00	140	57.5	ND	ND	45.2	20.0	ND	1.47	2.44	0.73	ND	ND
05-May-97	0.00	121	41.4	ND	ND	13.4	172	7.19	36.1	3.42	2.20	ND	ND

Appendix 3. Sampling date, rainfall amount, sample volume, and pesticide air concentration for each north and south sample taken at the Sacramento International Airport site, California—*Continued*

Date	Rainfall (inches)	Sample volume (m^3)		EPTC (ng/m^3)		Molinate (ng/m^3)		Thiobencarb (ng/m^3)		Trifluralin (ng/m^3)		Atrazine (ng/m^3)	
		South	North	South	North	South	North	South	North	South	North	South	North
12-May-97	0.00	156	82.1	ND	ND	13.7	31.7	18.3	ND	4.51	3.53	ND	ND
20-May-97	0.29	174	46.0	ND	ND	29.9	54.9	3.86	24.0	3.58	4.74	ND	ND
27-May-97	0.00	102	39.5	ND	ND	369	56.6	10.6	29.2	5.67	1.12	ND	ND
02-June-97	0.18	142	82.0	ND	ND	101	12.4	2.94	ND	8.94	0.40	ND	ND
10-June-97	0.50	152	42.2	ND	ND	12.2	10.7	3.34	3.79	3.48	5.64	ND	ND
16-June-97	0.00	56.5	45.1	ND	ND	20.4	14.7	2.73	ND	2.54	0.73	ND	ND
23-June-97	0.00	97.6	54.2	9.51	ND	5.40	9.19	ND	ND	2.94	2.15	ND	ND
30-June-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
07-July-97	0.00	149	37.1	ND	ND	ND	ND	ND	ND	3.14	ND	ND	ND
14-July-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
21-July-97	0.00	157	24.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
28-July-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
04-Aug-97	0.00	26.1	31.8	ND	ND	ND	ND	ND	ND	0.56	0.35	ND	ND
11-Aug-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
18-Aug-97	0.17	40.8	27.7	ND	ND	2.84	ND	ND	ND	3.46	2.50	ND	ND
25-Aug-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
02-Sep-97	0.00	75.0	33.2	ND	ND	ND	ND	ND	ND	0.75	ND	ND	ND
08-Sep-97	0.10	NST	NST	—	—	—	—	—	—	—	—	—	—
15-Sep-97	0.00	0.0	165	LV	ND	LV	ND	LV	ND	LV	2.29	LV	ND
22-Sep-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
29-Sep-97	0.06	0.0	88.4	LV	ND	LV	ND	LV	ND	LV	ND	LV	ND
06-Oct-97	0.61	NST	NST	—	—	—	—	—	—	—	—	—	—
13-Oct-97	0.00	0.1	84.5	LV	ND	LV	ND	LV	ND	LV	ND	LV	ND
20-Oct-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
27-Oct-97	Station taken off line												

Appendix 3. Sampling date, rainfall amount, sample volume, and pesticide air concentration for each north and south sample taken at the Sacramento International Airport site, California—*Continued*

Date	Rainfall (inches)	Sample volume (m^3)		Simazine (ng/m^3)		Alachlor (ng/m^3)		Metolachlor (ng/m^3)		Dacthal (ng/m^3)		Pendimethalin (ng/m^3)	
		South	North	South	North	South	North	South	North	South	North	South	North
02-Jan-96	—	TWS	TWS	—	—	—	—	—	—	—	—	—	—
09-Jan-96	0.70	207	86.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
16-Jan-96	0.79	167	77.8	ND	ND	ND	ND	ND	ND	0.07	ND	ND	ND
22-Jan-96	1.39	173	41.3	ND	LV	ND	LV	ND	LV	ND	LV	0.10	LV
29-Jan-96	2.95	100	185	ND	ND	ND	ND	ND	ND	ND	ND	0.61	ND
05-Feb-96	0.00	56.3	0.7	ND	LV	ND	LV	ND	LV	ND	LV	ND	LV
12-Feb-96	1.72	173	41.3	ND	LV	ND	LV	ND	LV	ND	LV	ND	LV
19-Feb-96	0.80	165	39.5	ND	LV	ND	LV	ND	LV	ND	LV	ND	LV
26-Feb-96	1.04	200	40.0	ND	LV	ND	LV	ND	LV	0.14	LV	0.22	LV
04-Mar-96	0.52	147	90.4	ND	—	ND	—	ND	—	ND	—	1.23	—
11-Mar-96	0.98	59.5	138	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
18-Mar-96	0.00	158	59.0	ND	ND	ND	ND	ND	ND	ND	ND	0.21	ND
25-Mar-96	0.17	184	41.2	ND	LV	ND	LV	ND	LV	ND	LV	ND	LV
01-Apr-96	1.42	91.1	78.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
08-Apr-96	0.00	164	60.3	ND	—	ND	—		—		—		—
15-Apr-96	0.86	204	41.4	—	ND	—	ND	—	ND	—	ND	—	ND
22-Apr-96	0.00	78.8	194	ND	ND	ND	ND	ND	0.39	ND	ND	ND	0.15
29-Apr-96	0.00	118	118	ND	ND	2.91	ND	ND	ND	ND	ND	ND	ND
06-May-96	0.00	163	33.9	ND	ND	ND	ND	0.26	ND	ND	ND	ND	ND
13-May-96	1.88	227	31.0	ND	ND	ND	ND	0.35	ND	ND	ND	ND	ND
20-May-96	0.20	224	169	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
29-May-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
03-June-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
10-June-96	0.00	265	18.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
17-June-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
24-June-96	0.00	147	37.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
01-July-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
08-July-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
15-July-96	0.00	157	56.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
22-July-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
29-July-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
05-Aug-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
12-Aug-96	0.00	220	23.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
19-Aug-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
26-Aug-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
03-Sep-96	0.00	74.7	60.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
09-Sep-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
16-Sep-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—

Appendix 3. Sampling date, rainfall amount, sample volume, and pesticide air concentration for each north and south sample taken at the Sacramento International Airport site, California—*Continued*

Date	Rainfall (inches)	Sample volume (m^3)		Simazine (ng/m^3)		Alachlor (ng/m^3)		Metolachlor (ng/m^3)		Dacthal (ng/m^3)		Pendimethalin (ng/m^3)	
		South	North	South	North	South	North	South	North	South	North	South	North
23-Sep-96	0.00	163	60.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
30-Sep-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
08-Oct-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
15-Oct-96	0.08	47.8	180	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
22-Oct-96	0.83	NST	NST	—	—	—	—	—	—	—	—	—	—
28-Oct-96	—	NST	NST	—	—	—	—	—	—	—	—	—	—
04-Nov-96	0.67	168	126	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
13-Nov-96	—	TWS	TWS	—	—	—	—	—	—	—	—	—	—
19-Nov-96	0.57	119	94.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
26-Nov-96	0.12	NST	NST	—	—	—	—	—	—	—	—	—	—
02-Dec-96	0.68	257	27.0	ND	ND	ND	ND	ND	ND	ND	ND	2.17	ND
09-Dec-96	1.22	NST	NST	—	—	—	—	—	—	—	—	—	—
16-Dec-96	1.62	182	29.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
23-Dec-96	1.61	NST	NST	—	—	—	—	—	—	—	—	—	—
30-Dec-96	2.33	117	98.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07-Jan-97	0.18	46.3	129	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
13-Jan-97	0.80	127	138	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
21-Jan-97	4.36	171	79.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
28-Jan-97	0.01	53.0	62.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
03-Feb-97	0.13	46.5	125	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
10-Feb-97	0.04	92.4	152	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
18-Feb-97	0.00	70.9	203	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
24-Feb-97	0.05	109	104	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
03-Mar-97	0.05	36.5	146	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
10-Mar-97	0.43	147	75.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
17-Mar-97	0.00	36.9	144	ND	ND	ND	ND	ND	ND	ND	ND	0.97	ND
24-Mar-97	0.43	113	115	ND	ND	ND	ND	0.24	0.47	0.27	ND	ND	ND
31-Mar-97	0.00	57.4	226	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07-Apr-97	0.00	85.0	159	ND	ND	ND	ND	ND	0.12	ND	ND	2.26	ND
14-Apr-97	0.29	241	19.5	ND	ND	ND	ND	0.26	ND	ND	ND	ND	ND
21-Apr-97	0.00	158	117	ND	ND	ND	ND	0.23	ND	ND	ND	ND	ND
28-Apr-97	0.00	140	57.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
05-May-97	0.00	121	41.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
12-May-97	0.00	156	82.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
20-May-97	0.29	174	46.0	ND	ND	0.66	ND	ND	ND	ND	ND	ND	ND
27-May-97	0.00	102	39.5	ND	ND	1.15	ND	ND	ND	1.53	ND	ND	ND
02-June-97	0.18	142	82.0	ND	ND	ND	ND	0.41	ND	ND	ND	ND	ND
10-June-97	0.50	152	42.2	ND	ND	ND	ND	ND	ND	0.61	ND	ND	ND

Appendix 3. Sampling date, rainfall amount, sample volume, and pesticide air concentration for each north and south sample taken at the Sacramento International Airport site, California—*Continued*

Date	Rainfall (inches)	Sample volume (m^3)		Simazine (ng/m^3)		Alachlor (ng/m^3)		Metolachlor (ng/m^3)		Dacthal (ng/m^3)		Pendimethalin (ng/m^3)	
		South	North	South	North	South	North	South	North	South	North	South	North
16-June-97	0.00	56.5	45.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
23-June-97	0.00	97.6	54.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
30-June-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
07-July-97	0.00	149	37.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
14-July-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
21-July-97	0.00	157	24.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
28-July-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
04-Aug-97	0.00	26.1	31.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
11-Aug-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
18-Aug-97	0.17	40.8	27.7	ND	ND	ND	ND	ND	ND	0.28	ND	ND	ND
25-Aug-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
02-Sep-97	0.00	75.0	33.2	ND	ND	ND	ND	ND	ND	0.21	ND	ND	ND
08-Sep-97	0.10	NST	NST	—	—	—	—	—	—	—	—	—	—
15-Sep-97	0.00	0.0	165	LV	ND	LV	ND	LV	ND	LV	ND	LV	0.91
22-Sep-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
29-Sep-97	0.06	0.0	88.4	LV	ND	LV	ND	LV	ND	LV	ND	LV	ND
06-Oct-97	0.61	NST	NST	—	—	—	—	—	—	—	—	—	—
13-Oct-97	0.00	0.1	84.5	LV	ND	LV	ND	LV	ND	LV	ND	LV	ND
20-Oct-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
27-Oct-97	Station taken off line												

Appendix 3. Sampling date, rainfall amount, sample volume, and pesticide air concentration for each north and south sample taken at the Sacramento International Airport site, California—*Continued*

Date	Rainfall (inches)	Sample volume (m^3)		Diazinon (ng/m^3)		Chlorpyrifos (ng/m^3)		Malathion (ng/m^3)		Methidathion (ng/m^3)		Carbaryl (ng/m^3)	
		South	North	South	North	South	North	South	North	South	North	South	North
02-Jan-96	—	TWS	TWS	—	—	—	—	—	—	—	—	—	—
09-Jan-96	0.70	207	86.5	2.60	5.92	ND	ND	ND	ND	ND	ND	ND	ND
16-Jan-96	0.79	167	77.8	4.41	0.18	ND	ND	ND	ND	ND	ND	ND	ND
22-Jan-96	1.39	173	41.3	3.96	LV	ND	LV	ND	LV	0.26	LV	ND	LV
29-Jan-96	2.95	100	185	2.61	26.8	ND	ND	0.23	ND	ND	ND	ND	ND
05-Feb-96	0.00	56.3	0.7	ND	LV	ND	LV	ND	LV	ND	LV	ND	LV
12-Feb-96	1.72	173	41.3	1.78	LV	ND	LV	ND	LV	ND	LV	ND	LV
19-Feb-96	0.80	165	39.5	0.30	LV	ND	LV	ND	LV	ND	LV	ND	LV
26-Feb-96	1.04	200	40.0	0.17	LV	0.49	LV	ND	LV	ND	LV	ND	LV
04-Mar-96	0.52	147	90.4	0.32	—	ND	—	ND	—	ND	—	ND	—
11-Mar-96	0.98	59.5	138	ND	0.16	3.01	13.0	ND	ND	ND	ND	ND	ND
18-Mar-96	0.00	158	59.0	0.45	ND	ND	ND	0.77	ND	ND	ND	ND	ND
25-Mar-96	0.17	184	41.2	0.25	LV	1.46	LV	2.46	LV	ND	LV	ND	LV
01-Apr-96	1.42	91.1	78.5	0.40	ND	ND	ND	ND	ND	ND	ND	ND	ND
08-Apr-96	0.00	164	60.3		—		—		—		—	ND	—
15-Apr-96	0.86	204	41.4	—	ND	—	ND	—	ND	—	ND	—	ND
22-Apr-96	0.00	78.8	194	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
29-Apr-96	0.00	118	118	ND	3.40	8.38	2.34	ND	ND	ND	ND	ND	ND
06-May-96	0.00	163	33.9	ND	ND	4.29	ND	ND	ND	ND	ND	0.90	3.23
13-May-96	1.88	227	31.0	1.76	ND	1.18	ND	ND	ND	ND	ND	ND	ND
20-May-96	0.20	224	169	0.51	ND	ND	2.05	ND	ND	ND	ND	ND	ND
29-May-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
03-June-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
10-June-96	0.00	265	18.1	ND	ND	0.40	ND	ND	ND	ND	ND	0.90	ND
17-June-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
24-June-96	0.00	147	37.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
01-July-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
08-July-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
15-July-96	0.00	157	56.6	0.25	ND	8.43	4.37	ND	ND	ND	ND	2.33	ND
22-July-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
29-July-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
05-Aug-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
12-Aug-96	0.00	220	23.3	ND	ND	112	1.70	ND	ND	ND	ND	ND	ND
19-Aug-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
26-Aug-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
03-Sep-96	0.00	74.7	60.4	ND	ND	4.95	21.2	ND	ND	ND	ND	ND	ND
09-Sep-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
16-Sep-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—

Appendix 3. Sampling date, rainfall amount, sample volume, and pesticide air concentration for each north and south sample taken at the Sacramento International Airport site, California—*Continued*

Date	Rainfall (inches)	Sample volume (m^3)		Diazinon (ng/m^3)		Chlorpyrifos (ng/m^3)		Malathion (ng/m^3)		Methidathion (ng/m^3)		Carbaryl (ng/m^3)	
		South	North	South	North	South	North	South	North	South	North	South	North
23-Sep-96	0.00	163	60.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
30-Sep-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
08-Oct-96	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
15-Oct-96	0.08	47.8	180	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
22-Oct-96	0.83	NST	NST	—	—	—	—	—	—	—	—	—	—
28-Oct-96	—	NST	NST	—	—	—	—	—	—	—	—	—	—
04-Nov-96	0.67	168	126	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
13-Nov-96	—	TWS	TWS	—	—	—	—	—	—	—	—	—	—
19-Nov-96	0.57	119	94.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
26-Nov-96	0.12	NST	NST	—	—	—	—	—	—	—	—	—	—
02-Dec-96	0.68	257	27.0	0.48	ND	ND	ND	ND	ND	ND	ND	ND	ND
09-Dec-96	1.22	NST	NST	—	—	—	—	—	—	—	—	—	—
16-Dec-96	1.62	182	29.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
23-Dec-96	1.61	NST	NST	—	—	—	—	—	—	—	—	—	—
30-Dec-96	2.33	117	98.5	0.96	ND	1.02	ND	ND	ND	ND	ND	ND	ND
07-Jan-97	0.18	46.3	129	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
13-Jan-97	0.80	127	138	ND	ND	0.63	ND	ND	ND	ND	ND	ND	ND
21-Jan-97	4.36	171	79.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
28-Jan-97	0.01	53.0	62.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
03-Feb-97	0.13	46.5	125	ND	1.65	ND	ND	ND	ND	ND	ND	ND	ND
10-Feb-97	0.04	92.4	152	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
18-Feb-97	0.00	70.9	203	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
24-Feb-97	0.05	109	104	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
03-Mar-97	0.05	36.5	146	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
10-Mar-97	0.43	147	75.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
17-Mar-97	0.00	36.9	144	2.86	0.24	9.08	3.80	3.27	ND	ND	ND	ND	ND
24-Mar-97	0.43	113	115	0.63	ND	1.94	0.66	1.73	2.89	ND	ND	ND	ND
31-Mar-97	0.00	57.4	226	ND	ND	ND	2.52	ND	ND	ND	ND	ND	ND
07-Apr-97	0.00	85.0	159	ND	ND	0.49	ND	ND	ND	ND	ND	ND	ND
14-Apr-97	0.29	241	19.5	ND	ND	0.58	ND	ND	ND	ND	ND	0.42	ND
21-Apr-97	0.00	158	117	ND	ND	ND	0.69	ND	ND	ND	ND	ND	ND
28-Apr-97	0.00	140	57.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
05-May-97	0.00	121	41.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
12-May-97	0.00	156	82.1	ND	ND	0.92	ND	ND	ND	ND	ND	0.80	ND
20-May-97	0.29	174	46.0	ND	ND	0.80	2.82	0.70	ND	ND	ND	0.60	1.80
27-May-97	0.00	102	39.5	ND	ND	1.68	ND	ND	ND	ND	ND	ND	ND
02-June-97	0.18	142	82.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
10-June-97	0.50	152	42.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.76
16-June-97	0.00	56.5	45.1	ND	ND	2.04	7.73	ND	ND	ND	ND	3.67	ND

Appendix 3. Sampling date, rainfall amount, sample volume, and pesticide air concentration for each north and south sample taken at the Sacramento International Airport site, California—*Continued*

Date	Rainfall (inches)	Sample volume (m^3)		Diazinon (ng/m^3)		Chlorpyrifos (ng/m^3)		Malathion (ng/m^3)		Methidathion (ng/m^3)		Carbaryl (ng/m^3)	
		South	North	South	North	South	North	South	North	South	North	South	North
23-June-97	0.00	97.6	54.2	ND	ND	3.44	8.22	ND	ND	ND	ND	1.53	6.62
30-June-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
07-July-97	0.00	149	37.1	ND	ND	31.3	ND	1.27	ND	ND	ND	2.71	30.6
14-July-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
21-July-97	0.00	157	24.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
28-July-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
04-Aug-97	0.00	26.1	31.8	ND	ND	1.99	3.83	ND	ND	ND	ND	ND	ND
11-Aug-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
18-Aug-97	0.17	40.8	27.7	ND	ND	4.13	22.6	ND	ND	ND	ND	0.44	1.39
25-Aug-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
02-Sep-97	0.00	75.0	33.2	ND	ND	2.95	3.81	ND	ND	ND	ND	0.42	0.63
08-Sep-97	0.10	NST	NST	—	—	—	—	—	—	—	—	—	—
15-Sep-97	0.00	0.0	165	LV	ND	LV	1.76	LV	ND	LV	ND	LV	ND
22-Sep-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
29-Sep-97	0.06	0.0	88.4	LV	0.27	LV	0.41	LV	ND	LV	ND	LV	ND
06-Oct-97	0.61	NST	NST	—	—	—	—	—	—	—	—	—	—
13-Oct-97	0.00	0.1	84.5	LV	ND	LV	ND	LV	ND	LV	ND	LV	ND
20-Oct-97	0.00	NST	NST	—	—	—	—	—	—	—	—	—	—
27-Oct-97	Station taken off line												

Appendix 3. Sampling date, rainfall amount, sample volume, and pesticide air concentration for each north and south sample taken at the Sacramento International Airport site, California—*Continued*

Date	Rainfall (inches)	Sample volume (m^3)		Carbofuran (ng/m^3)		Chlorothalonil (ng/m^3)	
		South	North	South	North	South	North
02-Jan-96	—	TWS	TWS	—	—	—	—
09-Jan-96	0.70	207	86.5	ND	ND	ND	ND
16-Jan-96	0.79	167	77.8	ND	ND	ND	ND
22-Jan-96	1.39	173	41.3	ND	LV	ND	LV
29-Jan-96	2.95	100	185	ND	ND	ND	ND
05-Feb-96	0.00	56.3	0.7	ND	LV	ND	LV
12-Feb-96	1.72	173	41.3	ND	LV	ND	LV
19-Feb-96	0.80	165	39.5	ND	LV	ND	LV
26-Feb-96	1.04	200	40.0	ND	LV	ND	LV
04-Mar-96	0.52	147	90.4	ND	—	0.22	—
11-Mar-96	0.98	59.5	138	ND	ND	ND	0.38
18-Mar-96	0.00	158	59.0	ND	ND	ND	ND
25-Mar-96	0.17	184	41.2	ND	LV	ND	LV
01-Apr-96	1.42	91.1	78.5	ND	ND	ND	ND
08-Apr-96	0.00	164	60.3	ND	—		—
15-Apr-96	0.86	204	41.4	—	ND	—	ND
22-Apr-96	0.00	78.8	194	ND	ND	ND	ND
29-Apr-96	0.00	118	118	ND	ND	ND	ND
06-May-96	0.00	163	33.9	ND	ND	ND	ND
13-May-96	1.88	227	31.0	ND	ND	ND	ND
20-May-96	0.20	224	169	ND	ND	ND	ND
29-May-96	0.00	NST	NST	—	—	—	—
03-June-96	0.00	NST	NST	—	—	—	—
10-June-96	0.00	265	18.1	ND	ND	ND	ND
17-June-96	0.00	NST	NST	—	—	—	—
24-June-96	0.00	147	37.9	ND	ND	ND	ND
01-July-96	0.00	NST	NST	—	—	—	—
08-July-96	0.00	NST	NST	—	—	—	—
15-July-96	0.00	157	56.6	ND	ND	ND	ND
22-July-96	0.00	NST	NST	—	—	—	—
29-July-96	0.00	NST	NST	—	—	—	—
05-Aug-96	0.00	NST	NST	—	—	—	—
12-Aug-96	0.00	220	23.3	ND	ND	5.27	0.73
19-Aug-96	0.00	NST	NST	—	—	—	—
26-Aug-96	0.00	NST	NST	—	—	—	—
03-Sep-96	0.00	74.7	60.4	ND	ND	3.71	2.78
09-Sep-96	0.00	NST	NST	—	—	—	—
16-Sep-96	0.00	NST	NST	—	—	—	—
23-Sep-96	0.00	163	60.4	ND	ND	2.74	ND

Appendix 3. Sampling date, rainfall amount, sample volume, and pesticide air concentration for each north and south sample taken at the Sacramento International Airport site, California—*Continued*

Date	Rainfall (inches)	Sample volume (m^3)		Carbofuran (ng/m^3)		Chlorothalonil (ng/m^3)	
		South	North	South	North	South	North
30-Sep-96	0.00	NST	NST	—	—	—	—
08-Oct-96	0.00	NST	NST	—	—	—	—
15-Oct-96	0.08	47.8	180	ND	ND	ND	ND
22-Oct-96	0.83	NST	NST	—	—	—	—
28-Oct-96	—	NST	NST	—	—	—	—
04-Nov-96	0.67	168	126	ND	ND	ND	ND
13-Nov-96	—	TWS	TWS	—	—	—	—
19-Nov-96	0.57	119	94.1	ND	ND	ND	ND
26-Nov-96	0.12	NST	NST	—	—	—	—
02-Dec-96	0.68	257	27.0	ND	ND	ND	ND
09-Dec-96	1.22	NST	NST	—	—	—	—
16-Dec-96	1.62	182	29.0	ND	ND	ND	ND
23-Dec-96	1.61	NST	NST	—	—	—	—
30-Dec-96	2.33	117	98.5	ND	ND	ND	ND
07-Jan-97	0.18	46.3	129	ND	ND	ND	ND
13-Jan-97	0.80	127	138	ND	ND	ND	ND
21-Jan-97	4.36	171	79.2	3.38	ND	ND	ND
28-Jan-97	0.01	53.0	62.2	ND	ND	ND	ND
03-Feb-97	0.13	46.5	125	ND	ND	ND	ND
10-Feb-97	0.04	92.4	152	ND	ND	ND	ND
18-Feb-97	0.00	70.9	203	ND	ND	ND	ND
24-Feb-97	0.05	109	104	ND	ND	ND	ND
03-Mar-97	0.05	36.5	146	ND	ND	ND	ND
10-Mar-97	0.43	147	75.0	ND	ND	ND	ND
17-Mar-97	0.00	36.9	144	ND	ND	ND	ND
24-Mar-97	0.43	113	115	ND	ND	ND	ND
31-Mar-97	0.00	57.4	226	ND	ND	ND	ND
07-Apr-97	0.00	85.0	159	ND	ND	ND	ND
14-Apr-97	0.29	241	19.5	ND	ND	ND	ND
21-Apr-97	0.00	158	117	ND	ND	ND	ND
28-Apr-97	0.00	140	57.5	ND	ND	ND	ND
05-May-97	0.00	121	41.4	ND	ND	ND	ND
12-May-97	0.00	156	82.1	ND	ND	ND	ND
20-May-97	0.29	174	46.0	ND	ND	ND	ND
27-May-97	0.00	102	39.5	ND	ND	ND	ND
02-June-97	0.18	142	82.0	ND	ND	ND	ND
10-June-97	0.50	152	42.2	ND	ND	ND	ND
16-June-97	0.00	56.5	45.1	ND	ND	ND	ND

Appendix 3. Sampling date, rainfall amount, sample volume, and pesticide air concentration for each north and south sample taken at the Sacramento International Airport site, California—*Continued*

Date	Rainfall (inches)	Sample volume (m^3)		Carbofuran (ng/m^3)		Chlorothalonil (ng/m^3)	
		South	North	South	North	South	North
23-June-97	0.00	97.6	54.2	ND	ND	ND	ND
30-June-97	0.00	NST	NST	—	—	—	—
07-July-97	0.00	149	37.1	ND	ND	ND	ND
14-July-97	0.00	NST	NST	—	—	—	—
21-July-97	0.00	157	24.6	ND	ND	ND	ND
28-July-97	0.00	NST	NST	—	—	—	—
04-Aug-97	0.00	26.1	31.8	ND	ND	ND	32.6
11-Aug-97	0.00	NST	NST	—	—	—	—
18-Aug-97	0.17	40.8	27.7	ND	ND	3.82	52.8
25-Aug-97	0.00	NST	NST	—	—	—	—
02-Sep-97	0.00	75.0	33.2	ND	ND	0.90	ND
08-Sep-97	0.10	NST	NST	—	—	—	—
15-Sep-97	0.00	0.0	165	LV	ND	LV	4.2
22-Sep-97	0.00	NST	NST	—	—	—	—
29-Sep-97	0.06	0.0	88.4	LV	ND	LV	0.54
06-Oct-97	0.61	NST	NST	—	—	—	—
13-Oct-97	0.00	0.1	84.5	LV	ND	LV	ND
20-Oct-97	0.00	NST	NST	—	—	—	—
27-Oct-97	Station taken off line						