Appendix A- Fate, Exposure, and Monitoring

Table 1 Environmental Fate Data Requirements for Methyl Parathion

Guideline #	Requirement Description	Are Data Available for Risk Assessment?	MRID	Study Classification
161-1	Hydrolysis	Yes	0013275 40784501	Supplemental Unacceptable for pH 5 results, but provides acceptable information at pH 7 and 9.
161-2	Photodegradation in Water	Yes	40809701	Unacceptable
161-3	Photodegradation on Soil	Yes	00061200 00072377 40809702	Unacceptable Unacceptable Unacceptable
162-1	Aerobic Soil Metabolism	Yes	41735901	Supplemental
162-2	Anaerobic Soil Metabolism	Not required if Anaerobic Aquatic Metabolism study is acceptable		
162-3	Anaerobic Aquatic Metabolism	Yes	41768901 46997601	Unacceptable Acceptable
162-4	Aerobic Aquatic Metabolism	Yes	0013361 00128789 42069601	Unacceptable Unacceptable Unacceptable
163-1	Leaching – Adsorption/Desorption	Yes	00071198 40999001	Supplemental Supplemental
163-2	Laboratory Volatility	Yes	42264201 41194001	Acceptable Acceptable
163-3	Field Volatility	No	41194001	Unacceptable
164-1	Terrestrial Field Dissipation	Yes	41481001 41752501 41481002 41752502	Supplemental Supplemental Unacceptable Unacceptable
164-2	Aquatic Field Dissipation	No	41481003 41481004 41752503 41752504	Unacceptable Unacceptable Unacceptable Unacceptable
165-1	Confined Accumulation in Rotational Crops	No	41596301	Unacceptable
165-3	Accumulation in Irrigated Crops	No	41481003 41481004 41752503 41752504	Unacceptable Unacceptable Unacceptable Unacceptable
165-4	Accumulation in Fish	Yes	41001901	Acceptable

Status of Environmental Fate Data

The current status of environmental fate data requirements for support of registration of methyl parathion is detailed below.

(1) Satisfied:

161-1. **Hydrolysis (Satisfied)** MRID 0013275 and 40784501

Phenyl ring-labeled [^{14}C]methyl parathion (radiochemical purity >99%), at 3.87-3.95 mg/L, hydrolyzed with half-lives of 68 days at pH 5, 40 days at pH 7, and 33 days at pH 9 in sterile aqueous buffered solutions at 25 C. Major hydrolysis degradates (10% of applied) of methyl parathion are monodesmethylparathion-methyl and 4-nitrophenol. Impurities and "unknowns" comprised a maximum of 2% of the applied during the 30-day study. In an earlier unacceptable study, methyl parathion hydrolyzed in unbuffered distilled water containing 0.1% acetone. Methyl paraoxon was not detected in abiotic hydrolysis studies.

161-2. **Photodegradation in Water (Satisfied)** MRID 40809701

[^{14}C]Methyl parathion (radiochemical purity >99%), at 4.71 mg/L, photodegraded with a half-life of 49 hours in sterile aqueous pH 5 buffered solutions that were irradiated continuously for 212 hours with a xenon arc lamp at 25 C. In the dark control solutions (incubation conditions not described), methyl parathion was relatively stable. Major photodegradation products (8-13%) were 4-nitrophenol and monodesmethylparathion-methyl. Unidentified degradates (fractions "A" and "B", which each contained more than one compound) each comprised up to 38% of the recovered radioactivity, and radioactivity designated as "remainder", which included methyl paraoxon, comprised a maximum of 16% of the recovered. $^{14}CO_2$ accounted for 18.4-30.9% of the applied radioactivity at 212 hours posttreatment, and organic volatiles comprised a maximum of 3.0-5.3% of the applied.

161-3. **Photodegradation on Soil (Satisfied)** MRID 00061200, 00072377, and 40809702

In two photodegradation studies on soils under artificial light, [^{14}C]methyl parathion (radiochemical purity >99%), at approximately 14 µg/cm^2, degraded with a biphasic half-life of an initial half-lives of 3.9 to 4.5 days and a secondary half-lives of 8.6 to 24 days on sandy loam soil when irradiated continuously for 281 hours with a xenon arc lamp at 25-28°C. Methyl parathion was stable ($t_{1/2}$ = 29 to 54 days) in dark controls.

In a photodegradation study on soil under natural light, [^{14}C]methyl parathion (radiochemical purity >99%), at >14 µg/cm^2, degraded with a dark control corrected half-life of 61 days on sandy loam soil. The soil was irradiated with sunlight outdoors for 22 days at approximately 25 C at Monheim, Germany, beginning July, 1987. Methyl parathion was relatively stable ($t_{1/2}$ = 106 days) in dark control treatments. The major photodegradate was 4-nitrophenol. However, unidentified radioactivity reached a maximum of 17.8% of the recovered radioactivity. Unextracted methyl parathion residues comprised a maximum of 20.1 to 41% of the applied radioactivity. At 281 hours posttreatment, $^{14}CO_2$ totaled 2.0 to 16.1% of the applied radioactivity, and organic volatiles were <0.1%.

162-1. **Aerobic Soil Metabolism (Upgradable Supplemental)** MRID 41735901

Ring-labeled [^{14}C]methyl parathion (radiochemical purity 97.2%) degraded with a registrant calculated half-life of 4.7 days in sandy loam soil that was incubated in the dark at 25 C. Since methyl parathion degradation appears to be biphasic, EFED recalculated a half-life of 3.75 days for methyl parathion using non-linear fitting techniques of the first-order degradation kinetic model to non-transformed data. Minor degradates (<10% of applied) were 4-nitrophenol and O,O-bis(4-nitrophenyl)-O-methyl phosphorothioate. Unidentified degradates ("solvent front") each comprised up to 4.97% of the applied radioactivity. Unextracted radioactivity in the soil was a maximum of 38.72% of the applied at 1 month posttreatment. Unextracted methyl parathion was predominately detected in the fulvic acid (31.9-15.7%) and humin fraction (38.5 to 45.1%). At 6 months posttreatment, volatilized $^{14}CO_2$ totaled 62.72% of the applied, and organic volatiles totaled 1.37% of the applied.

162-2. **Anaerobic Soil Metabolism**; not required if Anaerobic Aquatic Metabolism is made acceptable by the submission of supplemental data.

162-3. **Anaerobic Aquatic Metabolism (Satisfied)** MRID 41768901 and 46997601

In MRID 41768901 (unacceptable), uniformly ring-labeled [^{14}C]methyl parathion (radiochemical purity 95%), at a nominal concentration of 10 µg/g, degraded with a half-life of 12.2 hours in flooded sandy loam soil (10 g soil:20 mL water) that was incubated under anaerobic conditions in the dark at 25 $\pm$ 1 C. Methyl parathion (50% EC, Metacid), at 25 ppm, degraded with an observed half-life of 1-2 days in flooded alluvial soil incubated at 28 $\pm$ 4 C for 12 days. The major degradate of methyl parathion was 4-nitrophenol. Minor degradates (< 10% of applied) of methyl parathion are S-methyl parathion; O,O-bis-(4-nitrophenol)-O-methyl-phosphorothioate; methyl paraoxon; amino-methyl parathion; and S-phenyl-methyl parathion. Five unidentified degradates (Unknowns 2-6) were detected at maximum concentrations of 1.2-14.4% of the initial radioactivity. At 12 months post-treatment, unextracted [^{14}C]residues in the soil totaled 75.2% and $^{14}CO_2$ totaled 2.74% of the initial radioactivity. Unextracted [^{14}C]residues in the 14-day and 9-month samples were predominately detected in the fulvic acid (13.2-15.3%) and humin (20.1-20.2%) organic matter fraction. No organic volatiles were detected (detection limit not reported).

In MRID 46997601 (acceptable), [^{14}C-U-phenyl]-labeled methyl parathion (radiochemical purity 99.9%), at a nominal concentration of 1.02 µg/g, degraded with a half-life of 8.7 days in flooded sandy clay loam soil from California (50 g soil:73 mL water) that was incubated under anaerobic conditions in the dark at 25 $\pm$ 1 C for 365 days. The major degradates of methyl parathion were 4-nitrophenol (total system maximum 24.8% at 2 days post-treatment) and aminomethyl parathion (total system maximum 18.8% at 7 days post-treatment). The only identified minor degradate of methyl parathion was desmethyl parathion at <1% of applied, which cochromatographed with HPLC peak U-3. U-3 (maximum 18.8% at 30 days post-treatment) contained several unknown compounds (each <4%). At 365 days post-treatment, Non-extractable [^{14}C]residues in the soil totaled 70.6% and $^{14}CO_2$ totaled 19.2% of the initial radioactivity. Humin, humic acid and fulvic acid fractions comprised 32.5%, 1.3% and 6.8%, respectively, in the 7 day samples (40.5% total) and 66.4%, 2.2% and 9.3%, respectively, in the 91 day samples (77.8% total). Other volatilized organics totaled 0.1%.

162-4. **Aerobic Aquatic Metabolism (Satisfied)** MRID 0013361, 00128789, and 42069601

Radiolabeled methyl parathion degraded with a half-life of approximately 4.1 days in sandy loam soil that was flooded with water incubated for 30 days in the dark at 25 C (MRID 42069601). Methyl parathion was primarily associated with the soil fraction; it was not detected in the flood waters after 2 days post-treatment. The only degradate identified was 4-nitrophenol.

163-1. **Leaching and Adsorption/Desorption (Not Satisfied-Supplemental)** MRID 40999001

Based on batch equilibrium experiments conducted using autoclaved soils, [^{14}C]methyl parathion (radiochemical purity 98.8%), at 1.86-19.1 ug/mL, is expected to be very mobile in sand and sandy loam soil:0.01 N calcium chloride solution slurries and mobile in silt loam and clay loam soil:solution slurries (3:10 for sand and sandy loam soils, 1:10 for silt loam and clay loam soils) that were equilibrated for 24 hours at 25 C. Freundlich K_{ads} and exponential (1/n) values were 0.574 (1/n=0.96) for the sand soil, 1.82 (1/n=0.909) for the sandy loam soil, 7.09 (1/n=0.917) for the silt loam soil, and 8.71(1/n=0.961) for the clay loam soil. Since there is a correlation of methyl parathion sorption and soil organic matter content, it is appropriate to use the K_{oc} model for describing methyl parathion sorption (Sanchez-Martin and Sanchez-Camazano, 1991). K_{oc} values were 230 for the sand soil, 456 for the sandy loam soil, 591 for the silt loam soil, and 670 for the clay loam soil. Following desorption in pesticide-free calcium chloride solution for 24 hours, 43.12-54.26% of the radioactivity that had been adsorbed to the soils was desorbed from the silt loam and clay loam soils, 57.23-67.84% was desorbed from the sandy loam soil, and 98.62-112.35% was desorbed from the sand soil.

In earlier supplemental soil column studies, methyl parathion was mobile in sand and relatively immobile in sandy loam, silty clay loam, and silt loam through 30 cm soil columns eluted with 15.7 inches of water (MRID 00071198). Methyl parathion was only detected in the leachate of the sand soil. Open literature data indicate that methyl parathion sorption on soil is correlated to soil organic matter content (Sanchez-Martin and Sanchez-Camazano, 1991). Methyl parathion had an average K_{oc} of 697 ml/g across 8 mineral soils. In contrast, methyl paraoxon sorption was correlated to clay content.

Methyl paraoxon had distribution coefficients (K_ds) ranging from 1.77 to 14.3 ml/g in 8 mineral soils.

163-2. **Laboratory Volatility (Satisfied)** MRID #42264201 and 41194001

Methyl parathion, formulated as 4 lb ai/gallon EC, volatilized slightly (<0.51% of applied) from a Sesquatchie sandy clay loam soil that had been moistened to 50 or 75% at 1/3 of field capacity and then incubated in the dark at 25 C for 9 days. The maximum air concentration and volatility rate of methyl parathion was 55.88 $\mu g/m^3$ and 0.0128 $\mu g/cm^2$/hour, respectively, when incubated at 75% of the soil water holding capacity and 300 mL/minute air exchange rate.

163-3. **Field Volatility-(Not Satisfied)** MRID 41194001

Methyl parathion, applied at 1 lb ai/A either as EC or MCAP formulations (concentration of methyl parathion in the formulations not specified) to tobacco plots (soil not characterized) near Raleigh, North Carolina, volatilized with maximum mean air concentrations (110-cm sampling level immediately posttreatment) of 7400 and 3800 ng/m^3 for the EC and MCAP formulations, respectively.

In a USGS review, methyl parathion has been detected in air samples in Alabama, Florida, and Mississippi at concentrations ranging from 5.4 to 129 ng/m^3 (Majewski and Capel, 1995). Methyl parathion in air also was detected (0.4 to 42 ng/m^3) throughout the southeastern United States. Methyl parathion has also been detected (1.60 µg/L) in Iowa precipitation. The USGS suggested the methyl parathion concentrations in air tend to correspond with methyl parathion use areas associated with cotton, soybeans, wheat, and tobacco production. Of these crops, Cheminova will no longer be supporting the use of methyl parathion on tobacco.

164-1. **Terrestrial Field Dissipation (Partially Satisfied)** MRID 41481001, 41752501, 41481002, and 41752502

Methyl parathion rapidly dissipated with a half-life of approximately 1 day from plots of sandy loam soil located in California following the last of six applications of methyl parathion (4 lb/gal EC) to cotton at 1 lb ai/A/application (total application 6 lb ai/A). Supplemental field dissipation data indicate that methyl parathion (4 lb ai/gal EC), applied at six weekly applications at 1 lb ai/A/application (total 6 lb ai/A) to cotton on plots of loam soil located near Steele, Missouri, beginning July 28, 1988, decreased from an average of 0.052 ppm immediately following the last treatment to below the detection limit (0.05 ppm) by 1 day following the last treatment in the surface 4 inches of soil. Methyl parathion was not detected in the soil by 7 days posttreatment. Methyl parathion did not appear to accumulate or move into the soil as a result of repeated applications.

164-2. **Aquatic Sediment Dissipation (Satisfied)** MRID 41481003 and 41752503

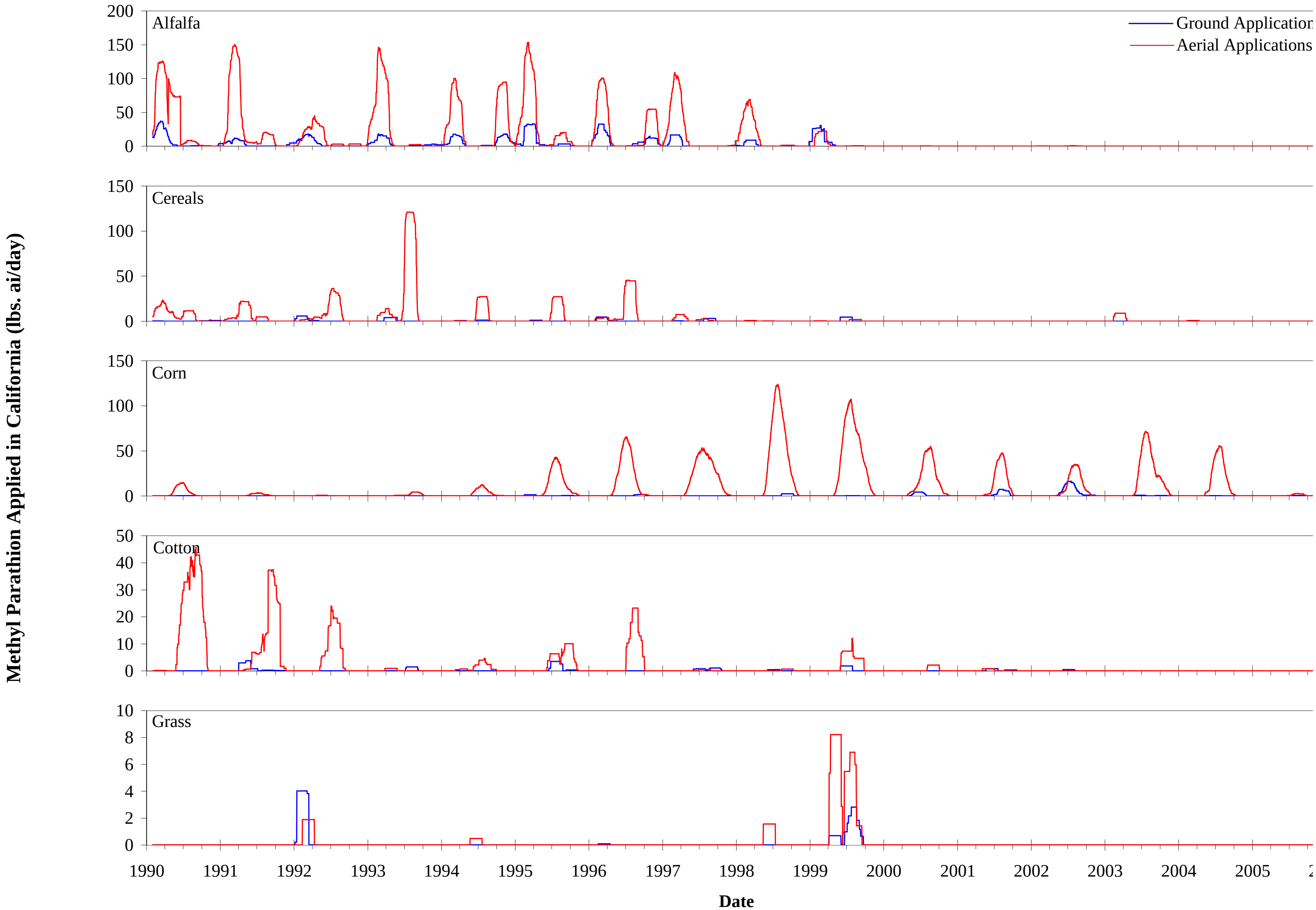
Methyl parathion dissipated from irrigation water with an observed half-life of approximately 1 day following the last of six weekly treatments of methyl parathion (4 lb ai/gal EC) at 0.75 lb ai/A/application (total 4.5 lb ai/A) to plots of irrigated (6-inch depth) sandy loam soil that was planted to rice and located near Madera, California; methyl parathion had totally dissipated from the irrigation water by 7 days post-treatment. Methyl parathion dissipated from irrigation water with an observed half-life of <7 days following the last of six weekly treatments of methyl parathion (4 lb ai/gal EC) at 0.75 lb ai/A/application (total 4.5 lb ai/A) to plots of irrigated (3-inch depth) loam soil planted to rice that were located near Steele, Missouri. Methyl parathion did not accumulate in the water as a result of repeated applications. The degradate p-nitrophenol was isolated in the irrigation water.

165-4 **Accumulation in Fish (Satisfied)** MRID 41001901

Bluegill sunfish exposed to radiolabeled methyl parathion at 0.104 mg/L had steady-state bioaccumulation factors of 39X in edible tissues, 108X in nonedible tissues, and 71X in whole body over a 28 day accumulation period. Steady-state conditions were obtained within 3 days. Radiolabeled residues in whole fish tissues were identified as 0,0-dimethyl-0-4-nitrophenyl phosphorothioate (methyl parathion 22.6%), 0-methyl-0-4-nitrophenyl phosphorothioate (46.3%), 0-methyl-0-4-nitrophenylphosphate (5.7%), 4-nitrophenol (18.1%), and 4-NP-gluconuride (1.2%). Unextracted residues represented 6.1%.

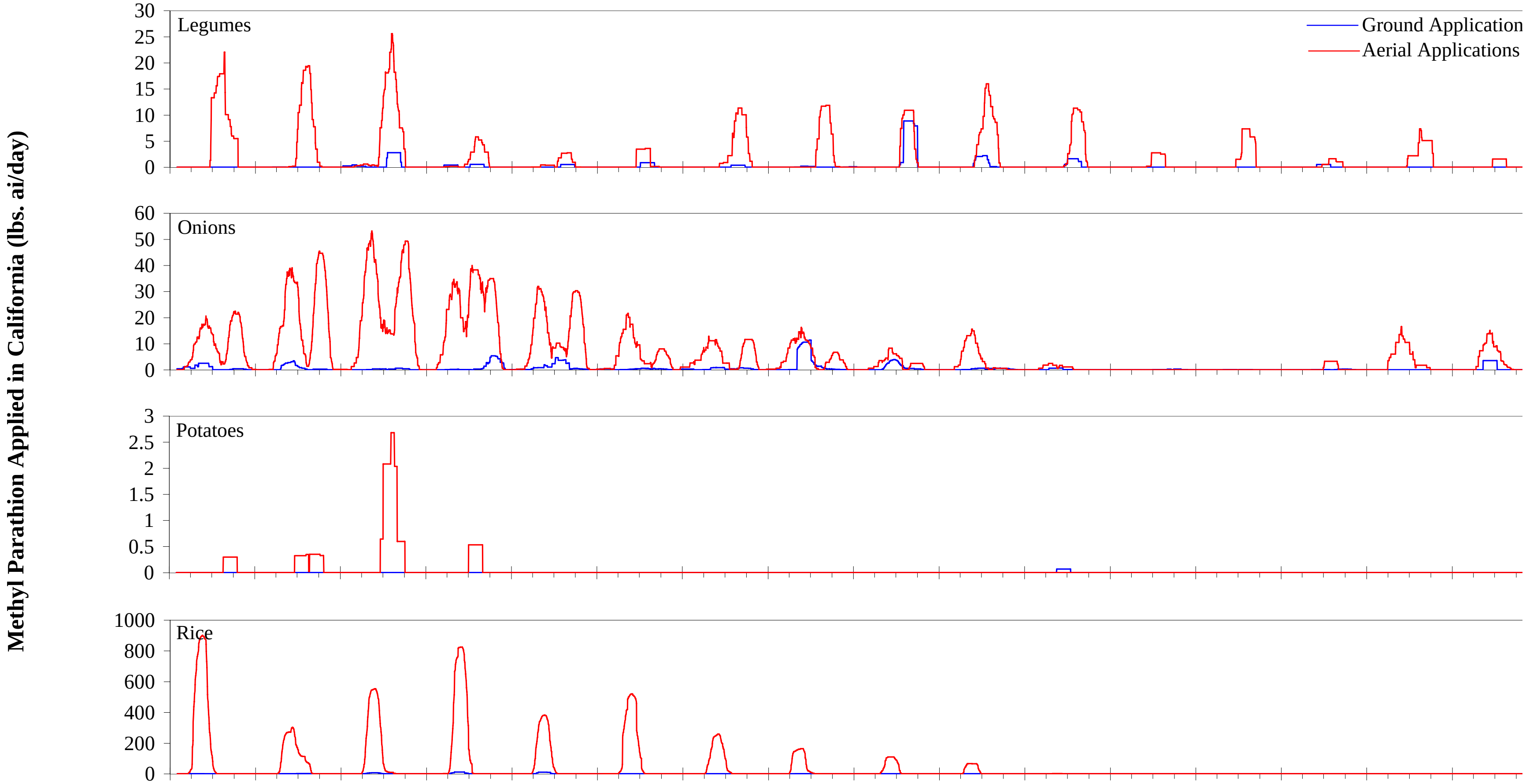
Determination of Application Dates

Application dates for each crop/site were derived from the CDPR PUR data set. For each exposure scenario group, trends in methyl parathion application (lbs/day) were obtained using moving averages (Figures 1 and 2). Inter-year variation in methyl parathion application are depicted using a 60-day moving average for CDPR PUR data from 1990-2005 (Appendix Figure 1). This graph provides some indication of whether intra-annual temporal trends in methyl parathion applications are consistent between years and how usage has changed over time. Appendix Figure 2 shows a 16-day moving average calculated across all 16 years of CDPR PUR data. (This can be thought of as the *average* moving-average for these years.) The peak of the moving averages in Appendix Figure 2 is used to calculate the midpoint of the methyl parathion application period used in each PRZM scenario. Using this peak value and the applications per growing season and re-treatment intervals from Table 5 (in main document), the first and last scenario application days (dashed lines in Appendix Figure2) are calculated to bracket the peak of the methyl parathion application for each exposure scenario group.



Methyl Parathion Applied in California (lbs. ai/day)
Alfalfa
Ground Application
Aerial Applications
Cereals
Corn
Cotton
Grass
200
150
100
50
0
10
8
6
4
2
40
30
20
10
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
Date

Figure 1. Variation in the rate of methyl parathion application from 1990 through 2005 in California by use.



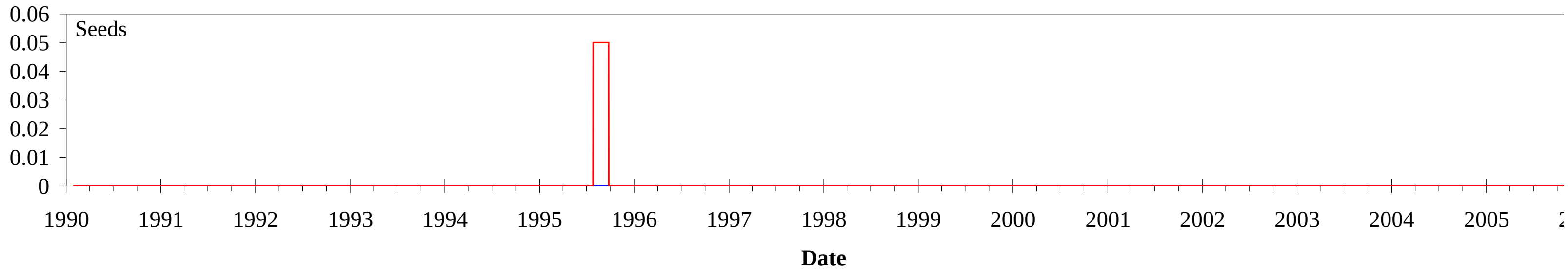


Figure 1. Continued.

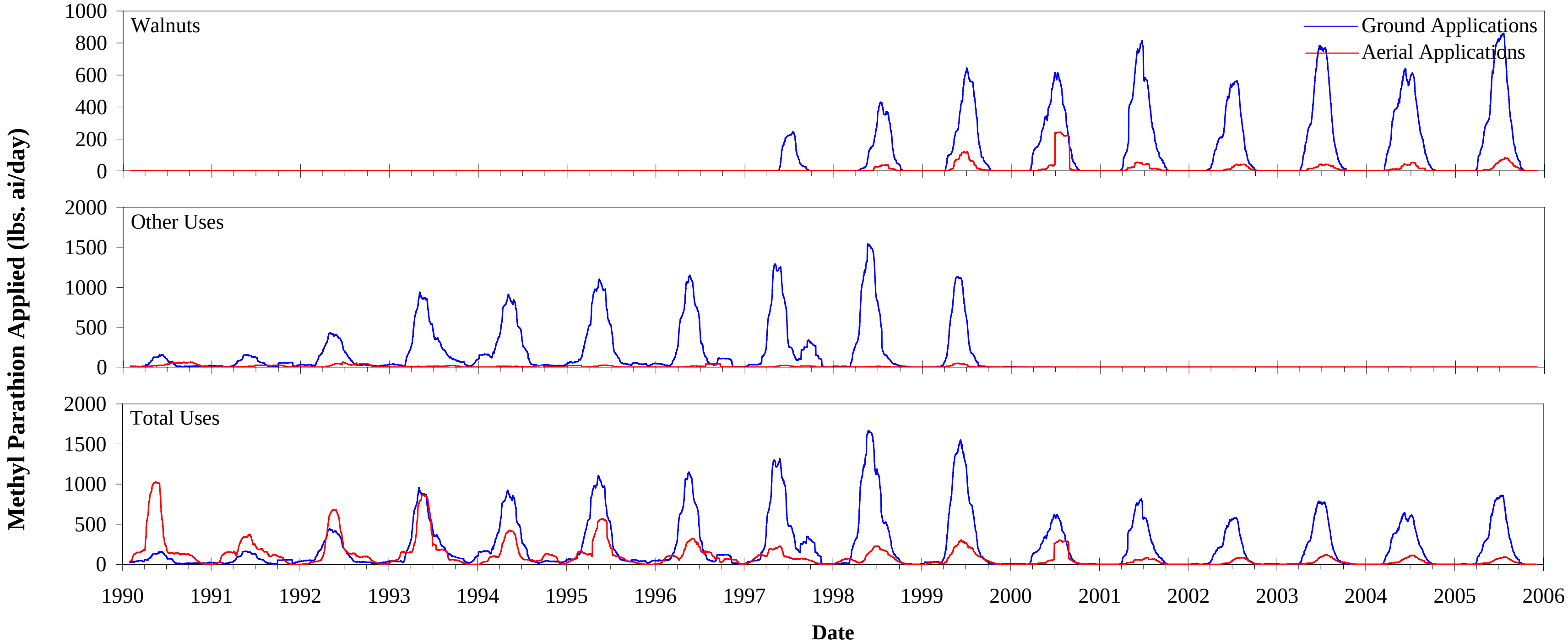


Figure 1. Continued. (The category "Other Uses" includes almond, apple, apricot, artichoke (globe and all or unspecified), beets (in general), broccoli, Brussels sprouts, cabbage, carrots (all or unspecified), carrots (in general), cauliflower, celery, general, cherry, grapes, wine grapes, kale, landscape maintenance, head lettuce (all or unspecified), leaf lettuce (all or unspecified), mustard (in general), nectarine, nursery-greenhouse grown cut flowers or greens, nursery-greenhouse grown plants in containers, nursery-greenhouse grown transplant/propagative material, nursery-outdoor container/field grown plants, nursery-outdoor grown cut

flowers or greens, nursery-outdoor grown transplant/propagative material, orange (all or unspecified), peach, pear, pecan, peppers (chili type and flavoring and spice crop), peppers (fruiting vegetable, bell, chili, etc.), plum (includes wild plums for human consumption), prune, research commodity, right-of-ways, safflower (in general), site unknown, soil application, preplant-outdoor (seedbeds, etc.), sorghum (forage – fodder, sorgo, etc.), spinach, strawberry (all or unspecified), structural pest control, tomato, processing/canning tomatoes.)

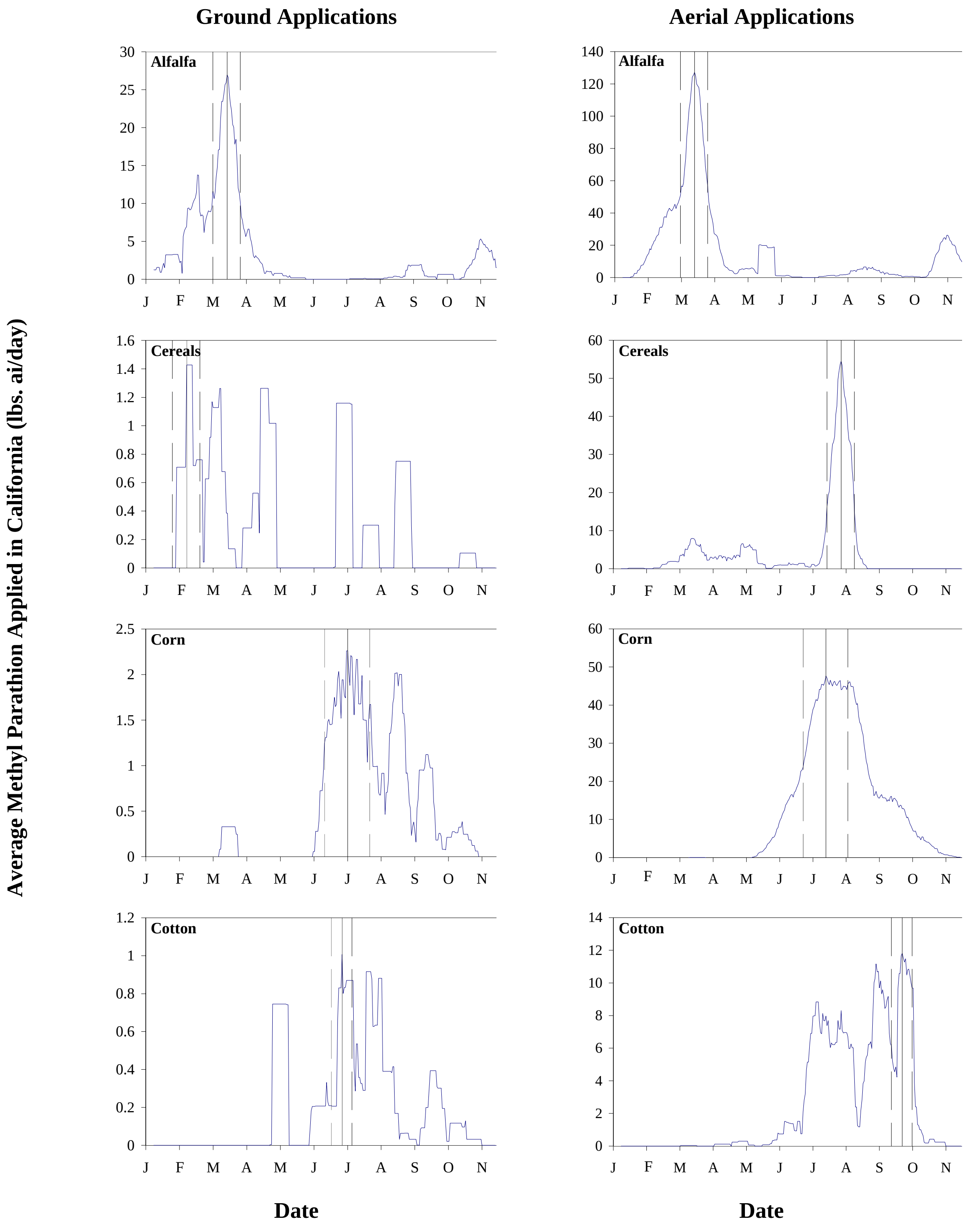


Figure 2. Generalized within-year methyl parathion application by crop use according to the CDPR PUR data. Vertical lines indicate the date of methyl parathion application in the single application scenarios (solid line) and first to last applications in the multiple application scenarios (dashed lines).

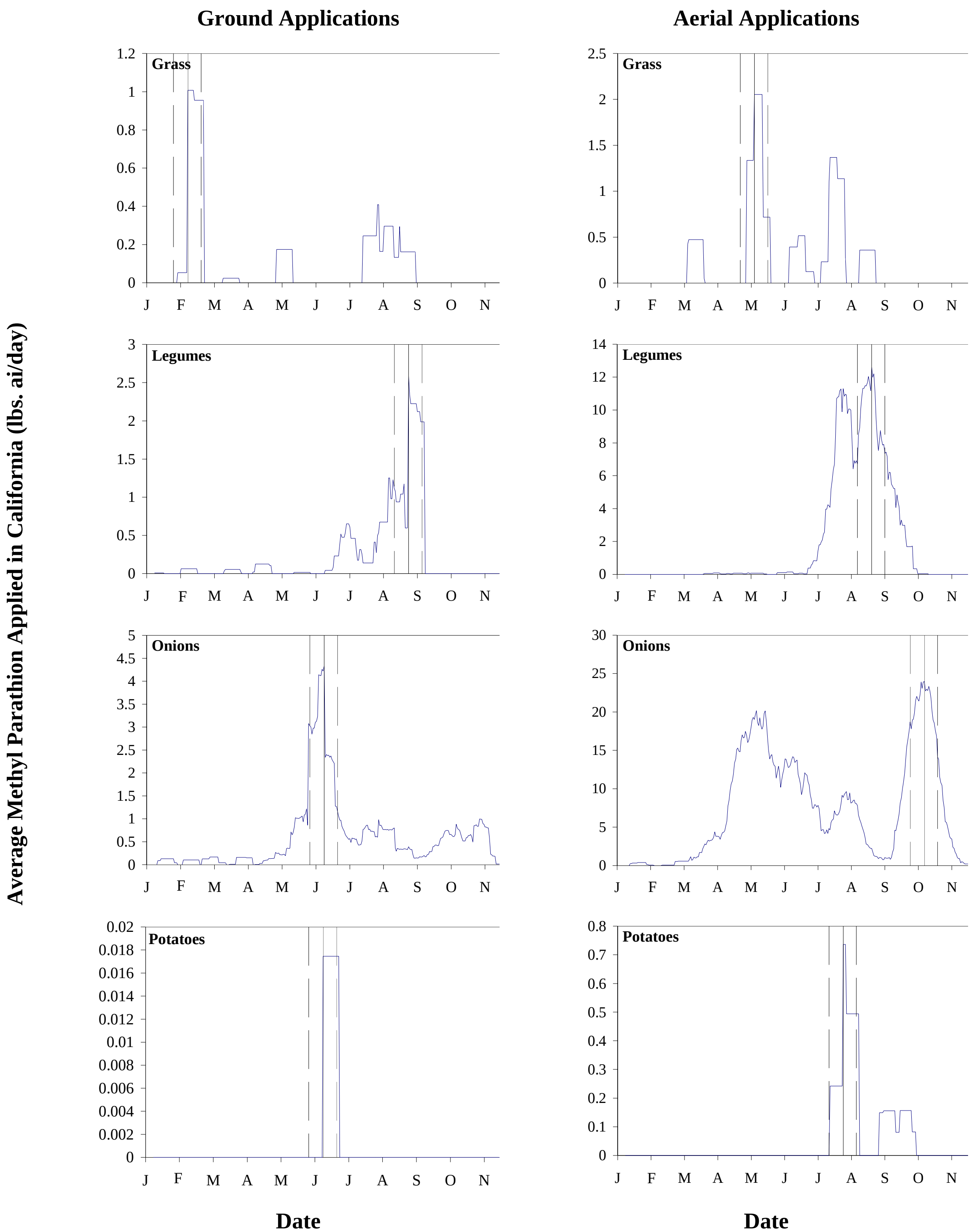


Figure 2. Continued.

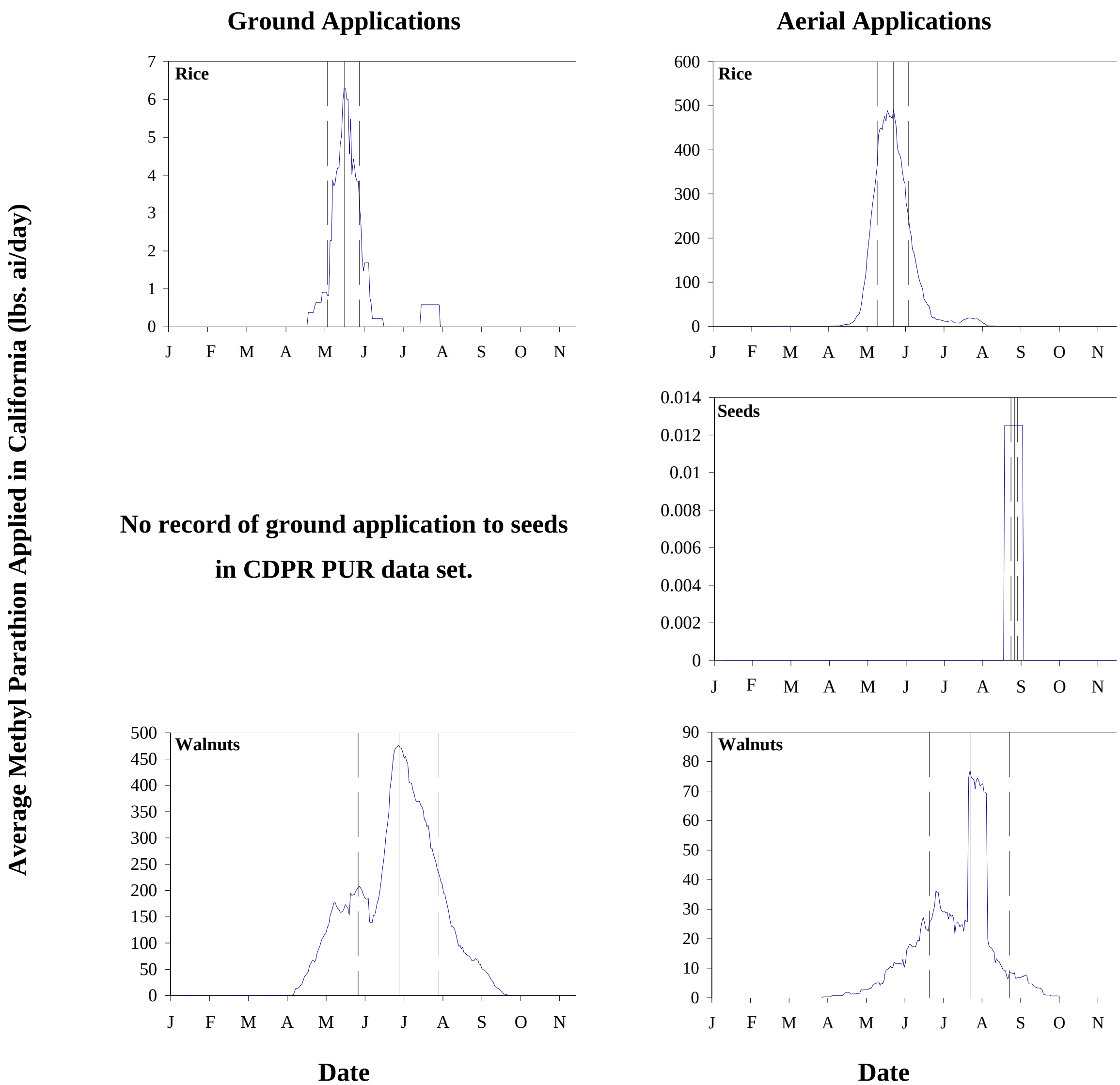


Figure 2. Continued.

Table 2 Rate Information for Specific Crops

Registration Number	Crops	Specific Conditions	Max/A	Interval/ Max Apps/yr
4581-393 (Section 3) 2 lb ai/gal	Corn	Not popcorn or specialty corn, field corn only in CA Sweet corn	4 pts 3 pts	14 days/4 14 days/3
	Cotton	None	4 pts	5 days/4
	Soybeans *(not grown in CA)*	None	3 pts	7 days/2
	Wheat, oats, barley	None	3 pts	7 days/2
	Onions	None	2 pts	7 days/4
	White potatoes	None	6 pts	7 days/4
4787-33 (Section 3)	Not considered, formulation intermediate			
4787-48 (Section 3) 4 lb ai/gal	Alfalfa	None	2 pts	Not specified/6 (2 per cutting)
	Corn (field, popcorn, sweet)	Sweet corn not in CA	1 pt	Not specified/2
	Cotton	None	1.5 pt	Not specified/5
	Grass (forage)	None	1.5 pt	Not specified/4 (2 per cutting)
	Rapeseed/Canola	Pollinator protection use restrictions, apply 3 hours before sunset until 3 hours after sunrise	1 pt	Not specified/2
	Rice	None	1.5 pts	Not specified/2
	Onions	None	1 pt	Not specified/2
	Potatoes (white)	None	1.5 pts	Not specified/3
	Sunflowers	None	2 pts	Not specified/2
	Soybeans *(not grown in CA)*	None	1 pt	Not specified/2
	Wheat, barley, oats and rye	None	1.5 pts	Not specified/2
5905-533 (Section 3) 4 lb ai/gal	Alfalfa	This max use rate specific to CA and NV	0.75 pts	Not specified
	Barley	None	1.5 pts	Not specified
	Beans (Dried)	None	3 pts	Not specified
	Corn	None	1 pt	Not specified
	Cotton	Rate listed is for boll weevil (not applicable in TX)	6 pts	3-10 days
	Grass (Hay, Pasture, Forage)	None	1.5 pts	Not specified
	Oats	None	1.5 pts	Not specified
	Onions	None	1 pts	Not specified
	Peas (Dried)	None	2 pts	Not specified
	Potatoes (white)	None	3 pts	Not specified
	Rapeseed/Canola	Apply only 3 hrs before sunset or 3 hours after sunrise	1 pt	Not specified
	Rice	Restrict spill from rice fields for 3	1.5 pts	Not specified

Registration Number	Crops	Specific Conditions	Max/A	Interval/ Max Apps/yr
		days Aerial application only		
	Rye	None	1.5 pts	Not specified
	Soybeans *(Not grown in CA)*	None	2 pts	Not specified
	Sugar beets	None	0.75 pts	Not specified
	Sunflowers	None	2 pts	5 days
	Wheat	None	1.5 pts	Not specified
5905-534 (Section 3) 4 lb ai/gal	Cotton	Also contains malathion Total OP is 1 lb/pt	2 pts	5 days
67760-43 (Section 3) 4 lb ai/gal	Alfalfa	Restriction to 0.75 pts in NV, but not CA	2 pts	Not specified/6 (2 per cutting)
	Barley, oats, rye, wheat	None	1.5 pts	Not specified/2
	Cotton	Highest for bollworm and bollweevil	6 pts	4-5 days/5
	Corn (field, popcorn)	None	1.5 pts	Not specified/2
	Grass (forage)	None	1.5 pts	Not specified/4 (2 per cutting)
	Potatoes (white)	None	3 pts	Not specified/3
	Rapeseed/Canola	None	1	Not specified/2
	Rice	None	1.5 pts	Not specified/2
	Onions	None	1 pt	Not specified/2
	Soybeans *(not grown in CA)*	None	2 pts	Not specified/2
	Sunflowers	None	2 pts	5 days/2
4581-393 (SLN) 2 lb ai/gal	Walnuts	None	8 pts	21 days/4

Table 3 Application Rates for Modeling

Crop Group Modeled (Scenario)	Surrogate For	Max Rate Lb ai/A	Max # of Apps/year	Interval	Label
Alfalfa (CA Alfalfa OP)	Alfalfa	1	6	Not specified (Assume 5 days)	4787-48 67760-43
Cereals (CA wheat RLF)	Barley Oats Rapeseed Rye Wheat	0.75	6	Not specified (Assume 5 days)	5905-533
Corn (CA corn OP)	Corn Field corn Sweet corn	1	4	14 days	4581-393
Cotton (CA cotton RLF)	Cotton	3	5	Not specified (Assume 5 days)	67760-43 5905-533
Grass (CA range/hay RLF)	Hay Pasture Forage	0.75	6	Not specified (Assume 5 days)	5905-533
Legumes (CA row crop RLF))	Beans (dry)	1.5	6 [a]	Not specified (Assume 5 days)	5905-533
Potatoes (CA potato RLF)	Potatoes	1.5	6 [a]	Not specified (Assume 5 days)	5905-533
Rice (Rice model)	Rice	0.75	6 [a]	Not specified (Assume 5 days)	5905-533
Root &Tuber Vegetables (CA Onion STD)	Onions	0.5	6 [a]	Not specified (Assume 5 days	5905-533
Seeds (CA row crop RLF)	Sunflower	1	2 [a]	Not specified (Assume 5 days)	5905-533
Tree Nuts (CA almonds RLF)	Walnuts	2	4	21 days	4581-533 (SLN)

[a] Rates in label given as per season, and were converted to a yearly rate based on crop cycle information developed by BEAD (Kaul 2007).

Table 4 Methyl Parathion EECs in the Standard EXAMS Water Body (single application)

Crop (lb ai/A)	Application Timing	Application Technique[a]	1 in 10 year EEC (µg/L)		
			Peak	21 day average	60 day Average
Alfalfa	3/15	Ground	1.5588	0.96821	0.54961
	3/14	Aerial	3.3487	2.3744	1.2452
Cereals	2/7	Ground	28.56	19.799	10.181
	7/28	Aerial	2.097	0.94837	0.41117
Corn	7/2	Ground	0.70589	0.42124	0.2019
	7/14	Aerial	2.7979	1.4278	0.6424
Cotton	6/27	Ground	6.06	3.5056	1.49
	9/22	Aerial	14.381	8.7045	5.9958
Grass	2/7	Ground	11.481	7.9935	4.3421
	5/5	Aerial	5.9008	3.8994	2.1136
Legumes	8/24	Ground	0.83909	0.47945	0.2485
	8/20	Aerial	4.195	2.4027	1.1795
Onions	6/9	Ground	2.0514	1.0907	0.45015
	10/7	Aerial	4.195	2.3661	1.3277
Potatoes	6/9	Ground	1.1232	0.51747	0.21059
	7/25	Aerial	2.097	0.90721	0.36689
Rice	5/17	Ground	499.46	70.04	24.52
	5/23	Aerial	499.46	70.04	24.52
Seeds	N/A*	Ground	0.5594	0.31956	0.17113
	8/27	Aerial	2.797	1.5956	0.78887
Walnuts	6/28	Ground	2.0767	1.3842	0.73794
	7/23	Aerial	5.9033	3.16	1.6705

[a] Both aerial and ground applications were modeled. Aerial applications typically result in higher aquatic EECs (due to greater spray drift), thus the aerial EECs are used as bounding estimates for each crop group.
[b] Used as the "highest" bounding estimate for developing risk quotients
[c] Used as the "lowest" bounding estimate for developing risk quotients. Although some estimates for ground applications are lower, the application rate is a function of the crop, not the application method, thus it is more conservative to use the aerial EECs.
* Not in Ca PUR data set. Used seeds aerial date.

Table 5 Methyl Parathion EECs in the Standard EXAMS Water Body (multiple applications)

Crop (lb ai/A)	Application Timing	Application Technique[a]	1 in 10 year EEC (µg/L)		
			Peak	21 day average	60 day Average
Alfalfa	3/2 – 3/27	Ground	8.2251	5.8958	3.7557
	3/1 – 3/26	Aerial	14.274	10.6319	7.0691
Cereals	1/25 – 2/19	Ground	119.578	80.275	45.897
	7/15 – 8/9	Aerial	5.4449	3.9615	2.4001
Corn	6/11 – 7/22	Ground	1.5347	0.99367	0.63917
	6/23 – 8/3	Aerial	4.3771	2.9623	2.4053
Cotton	6/17 – 7/6	Ground	23.641	13.35	7.3102
	9/12 – 10/1	Aerial	66.788	42.233	25.673
Grass	1/25 – 2/19	Ground	30.379	21.279	12.471
	4/22 – 5/17	Aerial	9.4192	7.1793	4.6151
Legumes	8/11 – 9/5	Ground	2.7312	2.0459	1.342
	8/7 – 9/1	Aerial	13.665	10.234	6.6966
Onions	5/27 – 6/21	Ground	6.4987	4.4242	2.3364
	9/24 – 10/19	Aerial	15.327	11.546	7.6946
Potatoes	5/27 – 6/21	Ground	3.5346	2.4175	1.29
	7/12 – 8/6	Aerial	5.1891	3.7924	2.1599
Rice	5/4 – 5/29	Ground	571.28	306.16	147.12
	5/10 – 6/4	Aerial	571.28	306.16	147.12
Seeds	N/A*	Ground	0.9746	0.59397	0.33462
	8/24 – 8/29	Aerial	4.8725	2.9675	1.5649
Walnuts	5/27 – 7/29	Ground	4.2181	2.8797	2.0006
	6/21 – 8/23	Aerial	9.539	5.7532	4.7528

[a] Both aerial and ground applications were modeled. Aerial applications typically result in higher aquatic EECs (due to greater spray drift), thus the aerial EECs are used as bounding estimates for each crop group.
[b] Used as the "highest" bounding estimate for developing risk quotients
[c] Used as the "lowest" bounding estimate for developing risk quotients. Although some estimates for ground applications are lower, the application rate is a function of the crop, not the application method, thus it is more conservative to use the aerial EECs.
* Not in Ca PUR data set. Used seeds aerial date.

Table 6 Methyl Paraoxon EECs in the Standard EXAMS Water Body (single application)

Crop (lb ai/A)	Application Timing	Application Technique[a]	1 in 10 year EEC (µg/L)		
			Peak	21 day average	60 day Average
Alfalfa	3/15	Ground	0.0327348	0.02033241	0.01154181
	3/14	Aerial	0.0703227	0.0498624	0.0261492
Cereals	2/7	Ground	0.59976	0.415779	0.213801
	7/28	Aerial	0.044037	0.01991577	0.00863457
Corn	7/2	Ground	0.01482369	0.00884604	0.0042399
	7/14	Aerial	0.0587559	0.0299838	0.0134904
Cotton	6/27	Ground	0.12726	0.0736176	0.03129
	9/22	Aerial	0.302001	0.1827945	0.1259118
Grass	2/7	Ground	0.241101	0.1678635	0.0911841
	5/5	Aerial	0.1239168	0.0818874	0.0443856
Legumes	8/24	Ground	0.01762089	0.01006845	0.0052185
	8/20	Aerial	0.088095	0.0504567	0.0247695
Onions	6/9	Ground	0.0430794	0.0229047	0.00945315
	10/7	Aerial	0.088095	0.0496881	0.0278817
Potatoes	6/9	Ground	0.0235872	0.01086687	0.00442239
	7/25	Aerial	0.044037	0.01905141	0.00770469
Rice	5/17	Ground	10.48876204	0.184907539	0.514911225
	5/23	Aerial	10.48876204	0.184907539	0.514911225
Seeds	N/A*	Ground	0.0117474	0.00671076	0.00359373
	8/27	Aerial	0.058737	0.0335076	0.01656627
Walnuts	6/28	Ground	0.0436107	0.0290682	0.01549674
	7/23	Aerial	0.1239693	0.06636	0.0350805

[a] Both aerial and ground applications were modeled. Aerial applications typically result in higher aquatic EECs (due to greater spray drift), thus the aerial EECs are used as bounding estimates for each crop group.
[b] Used as the "highest" bounding estimate for developing risk quotients
[c] Used as the "lowest" bounding estimate for developing risk quotients. Although some estimates for ground applications are lower, the application rate is a function of the crop, not the application method, thus it is more conservative to use the aerial EECs.
* Not in Ca PUR data set. Used seeds aerial date.

Table 7 Methyl Paraoxon EECs in the Standard EXAMS Water Body (multiple applications)

Crop (lb ai/A)	Application Timing	Application Technique[a]	1 in 10 year EEC (µg/L)		
			Peak	21 day average	60 day Average
Alfalfa	3/2 – 3/27	Ground	0.1727271	0.1238118	0.0788697
	3/1 – 3/26	Aerial	0.299754	0.2232699	0.1484511
Cereals	1/25 – 2/19	Ground	2.511138	1.685775	0.963837
	7/15 – 8/9	Aerial	0.1143429	0.0831915	0.0504021
Corn	6/11 – 7/22	Ground	0.0322287	0.02086707	0.01342257
	6/23 – 8/3	Aerial	0.0919191	0.0622083	0.0505113
Cotton	6/17 – 7/6	Ground	0.496461	0.28035	0.1535142
	9/12 – 10/1	Aerial	1.402548	0.886893	0.539133
Grass	1/25 – 2/19	Ground	0.637959	0.446859	0.261891
	4/22 – 5/17	Aerial	0.1978032	0.1507653	0.0969171
Legumes	8/11 – 9/5	Ground	0.0573552	0.0429639	0.028182
	8/7 – 9/1	Aerial	0.286965	0.214914	0.1406286
Onions	5/27 – 6/21	Ground	0.1364727	0.0929082	0.0490644
	9/24 – 10/19	Aerial	0.321867	0.242466	0.1615866
Potatoes	5/27 – 6/21	Ground	0.0742266	0.0507675	0.02709
	7/12 – 8/6	Aerial	0.1089711	0.0796404	0.0453579
Rice	5/4 – 5/29	Ground	11.99681257	6.429392335	3.089467058
	5/10 – 6/4	Aerial	11.99681257	6.429392335	3.089467058
Seeds	N/A*	Ground	0.0204666	0.01247337	0.00702702
	8/24 – 8/29	Aerial	0.1023225	0.0623175	0.0328629
Walnuts	5/27 – 7/29	Ground	0.0885801	0.0604737	0.0420126
	6/21 – 8/23	Aerial	0.200319	0.1208172	0.0998088

[a] Both aerial and ground applications were modeled. Aerial applications typically result in higher aquatic EECs (due to greater spray drift), thus the aerial EECs are used as bounding estimates for each crop group.
[b] Used as the "highest" bounding estimate for developing risk quotients
[c] Used as the "lowest" bounding estimate for developing risk quotients. Although some estimates for ground applications are lower, the application rate is a function of the crop, not the application method, thus it is more conservative to use the aerial EECs.
* Not in Ca PUR data set. Used seeds aerial date.