



Winston H. Hickox
Secretary for
Environmental
Protection

Department of Pesticide Regulation

830 K Street • Sacramento, California 95814-3510 • www.cdpr.ca.gov



Gray Davis
Governor

MEMORANDUM

TO: Kean S. Goh, Ph.D., Agricultural Program Supervisor IV
Environmental Monitoring and
Pest Management Branch

FROM: Don J. Weaver, Ph.D., Supervisor *DJW*
Senior Environmental Research Scientist
Environmental Monitoring and Pest Management Branch
(916) 324-4132

Joe Marade, Associate Environmental Research Scientist *JM*
Environmental Monitoring and Pest Management Branch
(916) 324-4119

DATE: March 19, 1999

SUBJECT: SUMMARY OF RESULTS FOR FY 1998-99 GROUND WATER
PROTECTION LIST MONITORING

BACKGROUND

In 1992, a group of 45 pesticide active ingredients (ai's) on the Ground Water Protection List (GWPL) [Title 3, California Code of Regulations, Section 6800(b)] were prioritized for monitoring as previously described (1). Through FY 1996-97, a total of 18 ai's (2)(3)(4)(5)(6)(7)(8) have been monitored with each ai having between 25 and 40 wells sampled as required by the GWPL monitoring protocol. Napropamide and oryzalin were selected for monitoring during FY 1998-1999 and will be the last ai's selected using the original protocol.

In the future, a revised protocol for Ground Water Protection List monitoring, approved in 1997 (9), will be used to select additional ai's for monitoring. Under the new protocol, active ingredients on the Ground Water Protection List are no longer ranked according to priority for monitoring. Instead, all active ingredients on the list are evaluated for their potential to contaminate ground water based on

information included under the original protocol plus any current information on recent detections, cultural practices or any other pertinent information. Each year, one or more active ingredients will be selected for monitoring with approval from the Branch Chief.

METHODS

EHAP sampled wells for napropamide and oryzalin during July 1998. Areas to be surveyed for well sampling were selected based on pesticide use report information for 1991-95. Counties were listed in descending order for use for each ai, and the ten counties with greatest use of each ai were selected. Sections within each county were then ranked in the same way resulting in a list of sections where the greatest quantities of the pesticides had been applied. Napropamide and oryzalin were both used in some sections and a number of those sections were targeted for monitoring both pesticides. Sampling crews drove through preselected sections of land in each county with the goal of sampling one well per section.

For each well sampled, one primary, one field blank, and four backup samples were collected. The primary sample was analyzed for napropamide and oryzalin each with a minimum detectable level (MDL) of 0.05 parts per billion (ppb). A second set of samples was also collected from each well and analyzed for atrazine, simazine, bromacil, cyanazine, diuron, hexazinone, metribuzin, norflurazon, prometon, prometryn, 2-amino-4-chloro-6-isopropylamino-s-triazine (DEA, deethylatrazine) and 2-amino-4-chloro-6-ethylamino-s-triazine (ACET) each with an MDL of 0.05 ppb. DEA is a degradation product of atrazine and ACET is a degradation product of atrazine and simazine.

RESULTS

A total of 64 wells were sampled in 13 counties (Table 1). Twenty-two wells in eight counties were targeted for napropamide, 31 wells in seven counties were targeted for oryzalin, and 11 wells in six counties were targeted for both ai's. However, all primary samples were analyzed for both napropamide and oryzalin as a single analysis. Thus, each well was tested for both ai's.

After the samples collected during July were analyzed, it was determined that the limits of quantitation for napropamide and oryzalin were unsatisfactory. Also, by that time the samples had been stored too long to use backup samples for a second analysis. Therefore, all wells had to be re-sampled for napropamide and oryzalin. Fifty-four of the wells were re-sampled during November, 1998. Ten wells could not be re-sampled because owners would not give permission. Again, one primary, two backup samples, and one field blank were collected from each well. Primary samples were analyzed by a different laboratory with an MDL of 0.05 ppb for napropamide and oryzalin.

None of the wells contained detectable residues of napropamide or oryzalin. Data were acceptable for other herbicide analyses performed on samples collected from each well in July. Overall, one or more herbicide residues were detected in 22 of the 64 original sampled wells including four of the wells that could not be re-sampled (Table 1). Atrazine residues were found in two wells, simazine in ten wells, ACET in 18 wells, DEA in one well, hexazinone in one, bromacil in one well, diuron in eight wells, and norflurazon in two wells. A four-section well survey will be conducted for each of the wells containing herbicide residues.

REFERENCES CITED

1. Weaver, D. March 9, 1992. Memorandum to J. Sanders: Prioritization of chemicals on the ground water protection list.
2. Weaver, D. and J. Marade. July 15, 1992. Memorandum to K. Goh: Summary of results for FY 1991-92 ground water protection list monitoring.
3. Weaver, D.J. and J. Marade. August 23, 1993. Memorandum to J. S. Sanders: Summary of results for FY 1992-93 ground water protection list monitoring.
4. Weaver, D.J. and J. Marade. August 19, 1994. Memorandum to K. S. Goh: Summary of results for FY 1993-94 ground water protection list monitoring.
5. Weaver, D. J. And J. Marade. June 30, 1995. Memorandum to K. S. Goh: Summary of results for FY 1994-95 ground water protection list monitoring.
6. Weaver, D.J. and J. Marade. August 21, 1996. Memorandum to K.S. Goh: Summary of results for FY 1995-96 ground water protection list monitoring.

Kean S. Goh
March 19, 1999
Page 4

7. Weaver, D.J. and J. Marade. June 30, 1997. Memorandum to K.S. Goh: Summary of results for 1996-97 ground water protection list monitoring.
8. Weaver, D.J. and J. Marade. June 30, 1998. Memorandum to K.S. Goh: Summary of results for 1997-98 ground water protection list monitoring.
9. Weaver, D.J. April 8, 1997. Revised protocol for selecting Ground Water Protection List active ingredients to be monitored under certain agricultural conditions.

If you have any comments or questions, please feel free to call us.

Attachments

cc: Douglas Y. Okumura
Bob Rollins
John Troiano
Donna Bartkowiak
Mark Pepple

Table 1. Detections of herbicides in wells sampled for 1998-99 Ground Water Protection List monitoring. Only data for herbicides that were detected are presented.

County	Township/ Range-Section	Well Targeted for Napropamide and/or Oryzalin	Concentration, parts per billion ^a								
			Atrazine	Simazine	ACET	DEA	Hexazinone	Norflurazon	Bromacil	Diuron	
Butte	21N/01E-01	Oryzalin	ND ^b	ND	ND	ND	ND	ND	ND	ND	ND
	21N/01E-25	Oryzalin	ND	ND	ND	ND	ND	ND	ND	ND	ND
	21N/01E-26	Both	ND	ND	ND	ND	ND	ND	ND	ND	ND
	21N/01E-35	Oryzalin	ND	ND	ND	ND	ND	ND	ND	ND	ND
Colusa	14N/02W-16	Both	ND	ND	ND	ND	ND	ND	ND	ND	ND
	15N/02W-31	Napropamide	ND	0.054	ND	ND	ND	ND	ND	ND	ND
	15N/03W-28	Napropamide	ND	ND	0.086	0.086	ND	ND	ND	ND	ND
	15N/03W-29	Napropamide	ND	ND	ND	ND	ND	ND	ND	ND	ND
	15N/03W-36	Napropamide	ND	ND	ND	ND	0.056	ND	ND	ND	ND
Fresno	14S/23E-32	Oryzalin	ND	ND	ND	ND	ND	ND	ND	ND	ND
	14S/23E-33	Oryzalin	ND	ND	0.051	ND	ND	ND	ND	ND	0.11
	15S/19E-25	Both	ND	ND	ND	ND	ND	ND	ND	ND	ND
	15S/22E-04	Oryzalin	ND	0.050	0.053	ND	ND	ND	ND	ND	0.87
	15S/22E-15	Both	ND	0.083	0.099	ND	ND	ND	ND	ND	0.068
	15S/23E-04	Oryzalin	ND	ND	ND	ND	ND	ND	ND	ND	ND
	15S/23E-04	Oryzalin	ND	ND	ND	ND	ND	ND	ND	ND	ND
	16S/20E-25	Oryzalin Did Not Resample	ND	0.11	0.25	ND	ND	ND	ND	ND	ND
Kern	25S/25E-04	Oryzalin	ND	ND	ND	ND	ND	ND	ND	ND	ND
	25S/26E-18	Oryzalin Did Not Resample	ND	ND	0.077	ND	ND	ND	ND	ND	ND

Table 1. Continued

County	Township/ Range-Section	Well Targeted for Napropamide and/or Oryzalin	Concentration, parts per billion							
			Atrazine	Simazine	ACET	DEA	Hexazinone	Norflurazon	Bromacil	Diuron
San Joaquin	02S/07E-09	Oryzalin	ND	ND	0.099	ND	ND	ND	ND	ND
	02S/07E-17	Oryzalin Did Not Resample	ND	ND	ND	ND	ND	ND	ND	ND
	02S/07E-23	Oryzalin	ND	ND	ND	ND	ND	ND	ND	ND
	02S/07E-23	Oryzalin	ND	ND	0.25	ND	ND	ND	ND	ND
	02S/08E-13	Both	ND	0.057	0.17	ND	ND	ND	ND	0.59
	02S/08E-15	Both Did Not Resample	ND	ND	ND	ND	ND	ND	ND	ND
Santa Clara	11S/04E-10	Napropamide	ND	ND	ND	ND	ND	ND	ND	ND
	11S/04E-15	Napropamide	ND	ND	ND	ND	ND	ND	ND	ND
	11S/04E-22	Napropamide	ND	ND	ND	ND	ND	ND	ND	ND
Stanislaus	03S/08E-09	Oryzalin	ND	ND	0.13	ND	ND	ND	ND	ND
	03S/08E-16	Oryzalin	ND	ND	ND	ND	ND	ND	ND	ND
	03S/09E-04	Oryzalin	ND	ND	ND	ND	ND	ND	ND	ND
	03S/09E-06	Oryzalin	ND	ND	ND	ND	ND	ND	ND	ND
	04S/08E-27	Napropamide	ND	ND	ND	ND	ND	ND	ND	ND
	04S/09E-30	Napropamide Did Not Resample	ND	ND	0.052	ND	ND	ND	ND	ND
Tulare	16S/23E-26	Oryzalin	ND	ND	ND	ND	ND	ND	ND	ND
	16S/23E-34	Oryzalin	ND	ND	ND	ND	ND	ND	ND	ND
	16S/24E-14	Oryzalin	ND	0.088	0.30	ND	ND	0.23	0.10	0.35

Table 1. Continued

County	Township/ Range-Section	Well Targeted for Napropamide and/or Oryzalin	Concentration, parts per billion							
			Atrazine	Simazine	ACET	DEA	Hexazinone	Norflurazon	Bromacil	Diuron
Tulare	16S/25E-19	Oryzalin	0.058	0.089	0.052	ND	ND	ND	ND	0.41
	19S/26E-16	Oryzalin	ND	0.26	0.73	ND	ND	0.18	ND	ND
	19S/26E-21	Oryzalin	ND	0.11	0.73	ND	ND	ND	ND	0.12
	19S/26E-24	Oryzalin Did Not Resample	ND	ND	0.12	ND	ND	ND	ND	0.45
	24S/25E-26	Oryzalin	ND	ND	ND	ND	ND	ND	ND	ND
Yolo	10N/01W-04	Napropamide	ND	ND	ND	ND	ND	ND	ND	ND
	10N/01W-09	Napropamide	ND	ND	ND	ND	ND	ND	ND	ND
	10N/01W-16	Napropamide	ND	ND	ND	ND	ND	ND	ND	ND
	10N/02E-12	Napropamide Did Not Resample	ND	ND	ND	ND	ND	ND	ND	ND

^a The minimum reporting limit for each chemical was 0.05 parts per billion.

^b ND = None detected.