

**Department of Pesticide Regulation
Environmental Monitoring Branch
1001 I Street, P.O. Box 4015
Sacramento, California 95812**

JUNE, 2013

**STUDY GW11: PROTOCOL FOR GROUND WATER PROTECTION LIST
MONITORING FOR LINURON, MEFENOXAM, METALAXYL, METHOMYL, AND
PROPYZAMIDE**

AMENDMENT 1

I. SUMMARY

This amendment adds the analyte metalaxyl to the scope of the Department of Pesticide Regulation (DPR) Study GW11 (Garretson, C. 2012) and outlines a sampling plan and timetable.

II. INTRODUCTION

DPR recently concluded the field portion of a ground water monitoring study for linuron, mefenoxam, methomyl, and propyzamide. During the course of the study it was decided to include metalaxyl as one of the target analytes when the analytical laboratory was able to develop a method for it. Both mefenoxam and metalaxyl are widely used fungicides that are registered for use on a large variety of crops. Metalaxyl was first registered for use in California in 1982. It is a mixture of R- and S- enantiomers (two molecules that are mirror images of each other and are nonsuperimposable) in near equal amounts. It was found that the R- enantiomer of metalaxyl provides most of its efficacy. Mefenoxam is comprised almost solely of the R- enantiomer, so it can be used at half the application rate as metalaxyl while providing the same efficacy. In 1996, Ciba-Geigy (currently Syngenta, and formerly Novartis), a major manufacturer of metalaxyl, voluntarily cancelled the registration of its products containing metalaxyl, while in the same year several products containing mefenoxam were registered in California (EPA 1996). Pesticide use data depicts a large decrease in metalaxyl use beginning in 1996 along with a large increase in the use of mefenoxam (CDPR, 2011).

Metalaxyl has been found to have the potential to leach to groundwater and has been found in five states (though not California), typically reaching levels up to 3ppb. It has been found at levels up to 246ppb, but the detection was considered not to be from normal field use. The Environmental Protection Agency (EPA) requires a ground water label advisory and the registrant agreed to provide a user education program if ground water levels reach 400ppb (EPA, 1994). Mefenoxam has no history of being detected in ground water in the U.S., but a 2007 drinking water assessment for mefenoxam concluded that the environmental fate and transport properties of metalaxyl and mefenoxam are equivalent, therefore results from data generated using metalaxyl are also relevant to mefenoxam (EPA, 2007).

III. STUDY PLAN

Since metalaxyl and mefenoxam are analytically indistinguishable, if either were present in the previously sampled wells, the results would have shown a positive find for mefenoxam. During the course of this study, approximately 30 wells that were sampled for mefenoxam were also located in sections where metalaxyl use was relatively high. Mefenoxam was not detected in any of these wells.

Using the revised method, DPR will sample 10 to 20 wells in Fresno, Kern, and Monterey counties in sections with the highest use of metalaxyl that were not previously sampled during this study. Also, five to ten previously sampled wells located in sections with relatively high use of both mefenoxam and metalaxyl will be resampled to validate the new analytical method.

IV. ANALYTICAL METHODS

Chemical analysis will be performed by the California Department of Food and Agriculture (CDFA) Center for Analytical Chemistry using method EMON-SM-05-025 (CDFA, Revised 2013). DPR has set the reporting limit for all analytes included in this study at 0.05 ppb (Tables 1). Mefenoxam and metalaxyl cannot be differentiated from each other in this method. Any positives for these compounds will be reported as a total amount of “mefenoxam and/or metalaxyl.”

Table 1. Method detection and reporting limits for EMON-SM-05-025 (CDFA, Revised 2013).

Pesticide	Method Detection Limit (ug/L)	Reporting Limit (ug/L)
Linuron	0.0129	0.05
Mefenoxam	0.0152	0.05
Metalaxyl	0.0087	0.05
Methomyl	0.0157	0.05
Propyzamide	0.0147	0.05

V. TIMETABLE

- June 2013: Conduct metalaxyl sampling.
- August 2013-September 2013: Obtain analysis results from the CDFA’s laboratory.
- March 2014: Complete study report.

bcc: Garretson Surname File

VI. REFERENCES

CDFA, 2013. Determination of Linuron, Isoxaben, Mefenoxam, Metalaxyl, Methomyl and Propyzamide in Well Water by Ultra Performance Liquid Chromatography Coupled to Tandem Mass Spectrometry. Available at: <http://www.cdpr.ca.gov/docs/emon/pubs/anl_methds/emon-sm-05-025.pdf> (verified May 31, 2013). California Department of Pesticide Regulation, Sacramento, California.

CDPR. 2011. Pesticide Use Reports. Available at: <<http://www.cdpr.ca.gov/docs/pur/purmain.htm>> (verified March 9, 2012) (verified June 7, 2013). California Department of Pesticide Regulation, Sacramento, California.

EPA, 1994, R.E.D. Facts: Metalaxyl (EPA 738-F-94-013 September 1994). Available at: <<http://www.epa.gov/oppsrrd1/REDS/0081.pdf>> (verified May 31, 2013).

EPA, 1996, metalaxyl (Apron, Ridomil, Subdue) Notice of Voluntary Cancellation. Available at: <<http://pmep.cce.cornell.edu/profiles/fung-nemat/febuconazole-sulfur/metalaxyl/metalaxyl-vol-canc-reg.html>> (verified May 31, 2013).

EPA, 2007, Memorandum: Mefenoxam: Human Health Risk Assessment. Available at: <http://www.epa.gov/pesticides/chem_search/hhbp/D325137.pdf> (verified May 31, 2013).

Garretson, C. 2012. Protocol for Ground Water Protection List Monitoring for Linuron, Mefenoxam, Metalaxyl, Methomyl, and Propyzamide. Available at: <<http://www.cdpr.ca.gov/docs/emon/pubs/protocol/studygw11protocol.pdf>> (verified June 7, 2013).