



California Notice 2006-07

SEMIANNUAL REPORT SUMMARIZING THE REEVALUATION STATUS OF PESTICIDE PRODUCTS DURING THE PERIOD OF July 1, 2005 THROUGH December 31, 2005

California regulations require the Department of Pesticide Regulation (DPR) to investigate reports of possible adverse effects to people or the environment resulting from the use of pesticides. If a significant adverse impact occurred or is likely to occur, the regulations require DPR to reevaluate the registration of the pesticide.

Title 3, California Code of Regulations (CCR), section 6221, specifies the factors under which DPR may initiate a reevaluation: (a) public or worker health hazard, (b) environmental contamination, (c) residue over tolerance, (d) fish or wildlife hazard, (e) lack of efficacy, (f) undesirable phytotoxicity, (g) hazardous packaging, (h) inadequate labeling, (i) disruption of the implementation or conduct of pest management, (j) other information suggesting a significant adverse effect, (k) availability of an effective and feasible alternative material or procedure that is demonstrably less destructive to the environment, and (l) discovery that data upon which a registration was issued is false, misleading, or incomplete. Often, ongoing DPR reviews trigger a reevaluation. Reevaluation triggers also include State and county pesticide use surveillance and illness investigations, pesticide residue sample analyses, environmental monitoring activities, and information from other state or federal agencies.

When a pesticide enters the reevaluation process, DPR reviews existing data. DPR requires registrants to provide additional data to determine the nature or the extent of the potential hazard or identify appropriate mitigation measures, if needed.

DPR concludes reevaluations in a number of different ways. If the data demonstrate that use of the pesticide presents no significant adverse effects, DPR concludes the reevaluation without additional mitigation measures. If additional mitigation measures are necessary, DPR places appropriate restrictions upon the use of the pesticide to mitigate the potential adverse effect. If the adverse impact cannot be mitigated, DPR cancels or suspends the registration of the pesticide product(s).

This report complies with the requirements of CCR section 6225. CCR section 6225 requires DPR to prepare a semiannual report describing pesticides evaluated, under reevaluation, or for which factual or scientific information was received, but no reevaluation was initiated. The report contains two sections:

- I. Formal Reevaluation - initiated when an investigation indicates a significant adverse impact has occurred or is likely to occur (page - 2); and



- II. Preliminary Investigations (Evaluations) - products or active ingredients for which DPR receives possible adverse factual or scientific information, but no reevaluation has been initiated (page - 10).

I. FORMAL REEVALUATION

Undertaken when investigations indicate that a significant adverse impact has occurred or is likely to occur.

BRODIFACOUM - 23 Products

Pesticide products containing brodifacoum are registered in California for the control of rats and mice in residential, industrial, commercial, agricultural, and public buildings. Registrants formulate the product with a grain-based bait in pellets, mini-pellets, and wax blocks. On December 30, 1999, at the request of the Department of Fish and Game (DFG), DPR placed pesticide products containing brodifacoum into reevaluation. DFG expressed concern that California's wildlife are exposed and may be adversely affected by currently registered uses of the anticoagulant rodenticide brodifacoum. This second generation rodenticide is hydrophobic, lipophilic, and the target rodent receives a delayed lethal dose with its first feeding. After multiple feedings, a rodent may have a significant "body burden" of this persistent pesticide at death.

DPR and DFG staff met with representatives of the Rodenticide Registrant Task Force in April 2001. At that meeting, DPR agreed to review additional information submitted by the registrants. DPR's biologist reviewed all data; slides, scientific journal articles, and correspondence submitted by the Rodenticide Registrant Task Force and other brodifacoum registrants. In October 2001, DPR learned that the U.S. Environmental Protection Agency (U.S. EPA) was completing a final draft of its ecological assessment of brodifacoum and several other rodenticides. Since it appeared that U.S. EPA had the same concerns as DPR and would initiate mitigation measures at a national level, DPR decided to wait for the completion of U.S. EPA's assessment. In January of 2003, U.S. EPA released its preliminary comparative ecological assessment for nine rodenticides, including brodifacoum, for a 60-day public comment period. U.S. EPA's preliminary assessment indicates that of the nine rodenticides studied, brodifacoum appears to pose the greatest potential overall risk to birds and nontarget mammals. Based on comments received, U.S. EPA revised its Comparative Ecological Risk Assessment on Rodenticides in July 2004. The deadline for public comment on the revised assessment was January 21, 2005.

Since the initiation of this reevaluation, the Department of Fish and Game (DFG) has identified several more incidents of non-target wildlife exposures to brodifacoum. Given the increased public interest in wildlife issues associated with brodifacoum and the length of

time U.S. EPA has taken to complete its assessment, DPR had an obligation to begin taking steps to address the problems associated with the use of brodifacoum. In addition to brodifacoum, two other active ingredients, bromadiolone and difethialone, are also second-generation anticoagulant rodenticides. All three active ingredients are capable of causing secondary toxicity due to build up and persistence in the target animal. Currently, rodenticides containing difethialone and bromadiolone are used far less than rodenticides containing brodifacoum. However, DPR is concerned that restrictions placed on the use of brodifacoum may result in an increase in the use of products containing difethialone and bromadiolone, with a resultant increase in non-target exposure to difethialone and bromadiolone.

At a November 18, 2005 meeting of the Pesticide Registration and Evaluation Committee, DPR presented an issue paper recommending the following mitigation measures: (1) use of rodenticide baits containing brodifacoum, difethialone, and bromadiolone be restricted to “indoor structural use only,” (2) use of rodenticides outside homes, industrial, commercial, agricultural and public buildings and around transport vehicles (ships, trains, aircraft) and related port or terminal buildings be prohibited; and (3) for the protection of children and pets, limit use of rodenticides indoors to tamper-proof bait boxes. In January 2006, DPR plans to issue a letter to brodifacoum, difethialone, and bromadiolone registrants giving them an opportunity to comment on DPR’s proposed mitigation measure and/or provide alternative mitigation measures.

CHLOROPICRIN – 50 Products

Chloropicrin is a colorless liquid that volatilizes readily when released into the atmosphere. Chloropicrin has been used as an insecticide since 1917 and a soil fumigant since 1920. As a space and soil fumigant, chloropicrin controls nematodes, bacteria, fungi, insects, and weeds. Chloropicrin can be used alone or in combination with other fumigants such as telone or methyl bromide. Because of its strong odor, small amounts of chloropicrin are added to methyl bromide and other fumigant applications as a warning agent.

Data submitted to DPR under the Birth Defect Prevention Act indicate that chloropicrin has the potential to cause adverse health effects at low doses. The National Institute for Occupational Safety and Health (NIOSH) set an 8-hour time-weighted average (TWA) of 0.1 parts per million (ppm) as the reference exposure limit (REL) for workers exposed to chloropicrin. The NIOSH standard of 0.1 ppm was recommended primarily for the prevention of eye irritation in humans.

Air monitoring data submitted in 1999 by the Chloropicrin Manufacturers Task Force (CMTF) indicate that the air levels of chloropicrin at some distances from treated greenhouses or fields could exceed the NIOSH standard. In the CMTF studies, off-site movement of chloropicrin was monitored during and after soil fumigation using four

application methods in three states. At the Arizona applications, considered to have meteorological conditions most comparable to California, 4 of the 16 monitoring stations located 180 feet from the treated fields had chloropicrin levels at or exceeding the NIOSH standard. The highest level monitored was around $1,700 \mu\text{g}/\text{m}^3$ (i.e., 0.25 ppm). The flux or emissions of chloropicrin was also measured using the aerodynamic method. At the Arizona sites, the flux ranged from 114 to $222 \mu\text{g}/\text{m}^2/\text{sec}$, or 12 to 25 percent of the chloropicrin applied during the highest 6-hour period. In addition, depending upon the aeration system used, the ambient air concentrations of chloropicrin near treated greenhouses could increase significantly as a result of the required ventilation operation. A typical aeration would involve venting the air in the greenhouse directly out to the exterior environment.

Pursuant to this reevaluation, DPR required chloropicrin registrants to conduct and submit the results of various worker exposure and air quality monitoring studies from field and greenhouse applications. DPR completed its review of the required monitoring data in August 2005. In November 2005, the Chloropicrin Task Force responded to DPR's comments and questions regarding the studies. DPR expects to complete its review of the Task Force's response in the first quarter of 2006.

CHLORPYRIFOS – 39 Products

The pesticide active ingredient chlorpyrifos is an insecticide registered for use on a variety of agricultural crops, turf, and for control of various insects indoors and outdoors. Chlorpyrifos is formulated as dust, wettable powders, emulsifiable concentrate, concentrates and ready-to-use solutions.

In March 2004, DPR placed all agricultural use (includes turf uses) products containing chlorpyrifos into reevaluation. The basis for the reevaluation is monitoring data collected by the Central Valley Regional Water Quality Control Board. The monitoring data showed chlorpyrifos levels in the rivers and tributaries of the San Joaquin Valley, the Sacramento/San Joaquin Delta, and Monterey County tributaries that exceeded the Department of Fish and Game's (DFG's) water quality objectives (WQO) for aquatic invertebrates.

Pursuant to this reevaluation, chlorpyrifos registrants are required to: (1) identify the processes by which chlorpyrifos pesticide products are contributing to detections of chlorpyrifos in surface water at levels that exceed DFG's WQOs, and (2) identify mitigation strategies that have been shown to reduce or eliminate chlorpyrifos residues in surface water. The basic manufacturer of chlorpyrifos responded to the reevaluation with the submission of data and information. DPR reviewed the submitted information, and agreed with the basic manufacturer's assessment of the modes of transport of chlorpyrifos residues to surface water. DPR then asked the basic manufacturer to identify mitigation strategies that will reduce or eliminate chlorpyrifos residues in surface water when used under California

conditions for all major agricultural uses. The company responded with the submission of data from three studies. In August 2005, the basic manufacturer identified mitigation measures that are intended to reduce chlorpyrifos residues in surface water when the products are used under California conditions. DPR plans to respond back to the basic manufacturer by January 2006.

CYFLUTHRIN -48 Products

The pesticide active ingredient cyfluthrin is a nonsystemic pyrethroid insecticide registered for use on numerous field, fruit, and vegetable crops, including citrus. In addition, DPR registers pesticide products containing cyfluthrin for use on lawns and ornamental plants, animals, and around industrial, institutional, agricultural, and household structures.

DPR initiated the reevaluation on May 8, 1998, based on its investigation of a May 1997 outbreak of respiratory irritation reported among orange harvesters exposed to residues of cyfluthrin in Tulare County and other pesticide illness reports related to cyfluthrin. As a part of the investigation of the Tulare County incident, DPR's Worker Health and Safety Branch conducted two separate inhalation-monitoring studies in orange groves during orange harvest. DPR determined that since dust and pollen are a part of the normal working environment, something different in the work environment led to the workers' respiratory irritation symptoms. DPR believes that the application of cyfluthrin to the citrus groves close to harvest led to the respiratory symptoms experienced. DPR compiled the results of its monitoring study in "Health and Safety Report, HS - 1765."

In mid-September 1998, the basic manufacturer of cyfluthrin submitted the results of several studies and journal articles concerning the respiratory irritation of cyfluthrin. On October 29, 1998, DPR met with the basic manufacturer to discuss the cyfluthrin reevaluation. At that meeting, DPR agreed to review the submitted studies and journal articles before deciding whether to require additional data. DPR reviewed the results of three studies regarding respiratory irritation. In the mouse study, a NOEL of 5.4 mg/m³ was identified, which was based on the reduced respiratory rate noted at the 21.9 mg/m³ exposure level. In the rat study, at the lowest exposure level of 0.7 mg/m³, the respiratory rate was minimally reduced in comparison to the control animals. The author calculated a NOEL of 0.5 mg/m³. In the third study, human subjects, under carefully controlled conditions, were exposed to cyfluthrin under static conditions. Throat and nasal irritation was noted by 8 of the 10 subjects in both exposures. Due to several problems including the indeterminate concentration to which the subjects were exposed, a NOEL for sensory irritation could not be established. Since the rat is more sensitive than the mouse to the irritating effects of cyfluthrin, the most appropriate NOEL appears to be the 0.5 mg/m³ derived from the rat study.

On August 16, 2001, DPR again met with the basic manufacturer to discuss the reevaluation of cyfluthrin. At the meeting, DPR agreed to review some additional new data before

requiring further tests. In October 2001, the basic manufacturer submitted: (1) two worker exposure studies regarding hand harvesting of oranges and sweet corn; (2) four indoor exposure studies; and (3) a study entitled "Study on the RD₅₀ Determination in Rats." Based on these data, DPR determined that no further structural monitoring data are required. However, DPR determined that it had insufficient data regarding worker exposure during the hand harvesting of sweet corn, so DPR required a sweet corn worker exposure study. In September 2002, the basic manufacturer of cyfluthrin submitted a protocol for a sweet corn exposure study. DPR staff reviewed and approved the protocol in October 2002. The first phase of the corn exposure study was conducted in the spring of 2003. The second phase of the study took place in the fall of 2003. The results of the study were submitted to DPR in October 2004. DPR anticipates completing its risk assessment of cyfluthrin in 2006.

DIAZINON – 18 Products

The pesticide active ingredient diazinon is an insecticide registered for use on a variety of agricultural crops and livestock, on turf and for control of various insects indoors and outdoors (about 80% of usage). Diazinon is formulated as dust, granules, wettable powders, seed dressings, emulsifiable solutions, impregnated materials, encapsulated materials, concentrates and ready-to-use solutions.

DPR initiated the reevaluation of diazinon products labeled for use as dormant sprays based on monitoring studies conducted between 1991 and 2001 by the U.S. Geological Survey, Dow Agrosiences, DPR, the California Regional Water Quality Control Board, Central Valley Region, and the State Water Resources Control Board. These studies demonstrate the presence of diazinon in surface waters of the Sacramento and San Joaquin Valleys at levels that exceed DFG's water quality criteria (WQC), especially during the dormant spray season.

To mitigate off-site movement of diazinon residues, diazinon registrants developed supplemental labeling for dormant spray diazinon products. The supplemental labeling adds mitigation measures, such as restricting application to ground equipment only, prohibiting application within 100 feet upslope of "sensitive aquatic sites," and prohibiting application to orchards when soil moisture is at field capacity, or when a storm event is likely. The supplemental labeling has been approved for use in California for sixteen of the currently registered diazinon products. The remaining products are waiting for U.S. EPA approval of the amended labeling.

In May 2004, the registrant submitted an update on various studies that are planned or in progress, and which are intended to indicate whether the new mitigation measures will be effective. In November 2004, DPR staff met with the registrant to discuss revisions to study protocols. Because of the inclement weather during January and February, the registrant was unable to initiate the planned studies. In August 2005, the registrant responded to DPR's

request for revised study protocols. DPR expects to complete its review of the registrant response in the first quarter of 2006.

METHYL BROMIDE - 48 Products

Methyl bromide is a colorless and odorless gas that has been widely used since the 1940s as a preplant soil fumigant for controlling nematodes, plant pathogens, weeds, and insects. After harvest, it is used to protect crops from pest damage during storage and transportation. Methyl bromide is also used to eradicate wood-destroying pests in homes and other structures, and to control pests in mills, ships, railroad cars, and other transportation vehicles.

Since the early 1990s, DPR has focused considerable attention on ensuring the safe use of the fumigant methyl bromide. The Air Resources Board monitored during the 2000 methyl bromide use season to measure ambient air concentrations and ascertain whether they posed a threat to public health. Data indicate that short-term levels of methyl bromide were well within acceptable limits. However, data also indicate that ambient air concentrations in a number of locations exceeded DPR's target exposure level for seasonal (six- to eight-week) exposures. DPR has determined that in certain high-use areas, the use of methyl bromide may cause an adverse impact. On June 26, 2001, DPR placed all products containing methyl bromide and allowing field fumigation into reevaluation based on the results of the 2000 monitoring data.

To determine the extent of seasonal exposure to methyl bromide in 2001, DPR required registrants to conduct ambient air quality monitoring in the Camarillo/Oxnard area of Ventura County and Santa Maria area of Santa Barbara County. The Alliance of the Methyl Bromide Industry (AMBI) completed its ambient air monitoring in October 2001 and submitted a final report in April 2002.

For 2002, DPR required methyl bromide registrants to conduct and submit the results of ambient air quality monitoring in Monterey/Santa Cruz and Ventura counties. Monitoring in Ventura County was completed in August 2002. Monitoring in Monterey and Santa Cruz counties was completed in October 2002. The Alliance submitted the final results of the 2002 studies in April 2003, and DPR completed its review of the data in June 2003.

Effective January 14, 2001, DPR adopted permanent methyl bromide field fumigation regulations to mitigate possible acute exposures to methyl bromide, and then adopted amendments to these regulations on April 8, 2002. However, the regulations were voided by a court decision (Ventura County Agricultural Association vs. DPR) on the grounds that DPR had not adequately consulted with the California Department of Food and Agriculture prior to noticing the regulations. In order to maintain continuity and to ensure continued protection of the health and safety of workers and the public when methyl bromide is used for field fumigation, DPR filed emergency regulations to repeal and readopt these

regulations. During the process to permanently adopt these regulations, DPR determined that additional mitigation measures were necessary and proposed an additional regulatory level to protect the public and agricultural employees from possible subchronic methyl bromide exposure hazards. On November 3, 2004, the Office of Administrative Law approved the methyl bromide field fumigation regulations. DPR is waiting to determine the effectiveness of the mitigation measures before concluding the reevaluation.

CERTAIN AGRICULTURAL AND COMMERCIAL STRUCTURAL-USE LIQUID FORMULATION PESTICIDE PRODUCTS (DATA CALL-IN) – 787 Products

On February 16, 2005, DPR placed certain liquid formulation agricultural and commercial structural-use pesticide products into reevaluation. The basis for the reevaluation is concern about the release into the atmosphere of volatile organic compounds (VOCs) from agricultural and commercial structural-use pesticide products. VOCs and nitrogen oxides react with sunlight to create ground-level ozone. Ozone is a major air pollutant, which is known to be harmful to both human health and vegetation. Many pesticide active ingredients and inert ingredients are VOCs.

The federal Clean Air Act requires states to submit state implementation plans (SIPs) for implementing, maintaining, and enforcing national ambient air quality standards (NAAQS) for air pollutants, such as ozone, in each air quality control region of the State. Any region that does not meet the NAAQS for a given pollutant is designated as a federal nonattainment area (NAA). Currently, several California air quality control regions do not meet the NAAQS for ozone.

In 1994, the California Air Resources Board (ARB) submitted a SIP to the U.S. Environmental Protection Agency (U.S. EPA). The SIP included a pesticide element. The pesticide element (also referred to as the Pesticide SIP) addresses VOCs that result from the use of agricultural and commercial structural-use pesticides. (Consumer pesticide product sources of VOCs are regulated by ARB.) In the pesticide element, DPR committed to reducing VOC emissions from agricultural and commercial structural-use pesticides by specified amounts within specified time periods for five NAAs. Currently three of the five NAAs do not meet the goals established in the 1994 SIP (Relative to 1990 base year: San Joaquin Valley, 12 percent reduction by 1999; Ventura, 20 percent reduction by 2005; and Southeast Desert, 20 percent reduction by 2007.)

To implement the 1994 SIP, DPR developed a method to estimate the VOC content (emission potential) of pesticide products and to calculate estimated pesticidal VOC emissions. DPR used thermogravimetric analysis (TGA) data to determine the VOC content of each pesticide product, and in conjunction with data from DPR's pesticide use-reporting system calculated estimated annual VOC emission totals for each pesticide product. In order to obtain TGA data on each agricultural and commercial structural-use pesticide, DPR placed

all agricultural and commercial structural-use pesticides formulated as liquids into reevaluation in 1994, and all solid formulations into reevaluation in 1995.

However, during these reevaluations, DPR gave registrants the option of calculating the VOC emission potential of a pesticide product using water and/or inorganic subtraction, instead of submitting TGA data. In addition, if no data (either TGA or subtraction) were submitted for a given pesticide product, DPR assigned the product a default emission potential value based on the highest TGA value for the product's formulation category (default values were later revised to the median TGA value for each formulation category). In 1996, DPR requested that registrants of new agricultural and commercial structural-use products submit TGA data for each new product. A few registrants of new pesticide products submitted TGA data; however, the majority did not, and DPR had to assign default emission potential values to many new pesticide products.

As a result, DPR only has TGA data for approximately 30-40 percent of currently registered agricultural and commercial structural-use pesticides. This means that DPR's current calculations of total VOC emissions from pesticide products may be inaccurate. DPR needs actual TGA emission potential data on currently registered agricultural and commercial structural-use pesticide products. Since pesticide products formulated as liquids (i.e., emulsifiable concentrates, aqueous concentrates, flowable concentrates, oils) have the highest VOC emission potential and constitute the bulk of the products with unknown (default) emission potentials, DPR placed these types of products into reevaluation and required the submission of TGA data on each product by December 31, 2005.

CERTAIN AGRICULTURAL AND COMMERCIAL STRUCTURAL-USE LIQUID FORMULATION PESTICIDE PRODUCTS (REFORMULATION) – 748 Products

On May 31, 2005, DPR placed certain liquid formulation agricultural and commercial structural-use pesticide products into reevaluation. The basis for this reevaluation is the same as the basis for the reevaluation listed above. However, the purpose of the reevaluation is different.

DPR principally initiated the second reevaluation to meet the 1999 pesticide VOC emission goal of 21 tons/day for the San Joaquin Valley NAA. Total pesticide VOC emissions in the San Joaquin Valley NAA were 23.2 tons/day for May-October 2002, and 26.5 tons/day for May-October 2003, exceeding the 1999 goal by 2.0 and 5.4 tons/day. Fumigants, and pesticide products formulated as liquids make up most of the San Joaquin Valley pesticide VOC emission inventory. Fumigant products containing metam-sodium, 1,3-dichloropropene, and methyl bromide as primary active ingredients (chloropicrin makes up a significant portion of several fumigant products, as a secondary active ingredient) comprise the largest portion of the San Joaquin Valley VOC emission inventory. However, fumigants are not amenable to reformulation. Liquid products, particularly those formulated as

emulsifiable concentrates, are the next highest contributors to the pesticide VOC inventory. Pesticide products formulated as liquids comprise approximately 40 percent of the pesticide VOC emission inventory in the San Joaquin Valley NAA area, with products containing chlorpyrifos and glyphosate accounting for approximately 15 percent (3.9 tons/day) of the inventory.

Staff analyses indicate that reformulation of the liquid pesticide products included in this reevaluation could result in significant VOC reductions in the San Joaquin NAA and throughout the state. Additionally, reformulation is one of the few regulatory options for which DPR can estimate VOC reductions using available data. Reformulation is likely a viable alternative only for liquid, non-fumigant pesticides. It is probably not possible or cost-effective to lower the VOC content of pesticides formulated as solids.

The list of pesticide products included in this reevaluation differs somewhat from the list of products included in the previous VOC data call-in reevaluation. Pursuant to this reevaluation, registrants are required to choose one of the following three options for each product included in the reevaluation: (1) submit a written commitment to reformulate the pesticide product to a VOC emission level of 20 percent or less, including information on how the product will be reformulated, a detailed timeline for accomplishing each task, and a schedule for progress reports; (2) submit a request for exemption if your product does not meet the established reevaluation criteria; or (3) submit a detailed explanation as to why the pesticide product cannot be reformulated. Registrant responses are due March 1, 2006

II. PRELIMINARY INVESTIGATIONS (EVALUATIONS)

DPR conducts preliminary investigations on products for which DPR or other State or county agencies have identified possible hazards. As a result of evaluation, the investigations may lead to formal reevaluation.

No current preliminary investigations.

For more information, please contact Ms. Ann Prichard, Senior Environmental Research Specialist in the Pesticide Registration Branch, by e-mail at <aprichard@cdpr.ca.gov> or by telephone at (916) 324-3931.

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3/20/06

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