State of California

Memorandum

To : Tobi Jones, Chairperson
Pesticide Registration and
Evaluation Committee

Date : October 27, 1989

Place :

From : Department of Food and Agriculture

Subject : Director's Response Concerning Aldicarb Pursuant to AB 2021

Attached is a public notice of decision serving as my response to the findings and recommendations of the Subcommittee concerning ground water detections of aldicarb. My response has been made in accordance with all authorities and requirements stipulated in the process of review for these detections. The Subcommittee's findings and recommendations were transmitted to me on September 28, 1989. Therefore, this response has been made within the 30 days statutory deadline.

I thank you and all the members of the Subcommittee for carrying out this difficult task.

Henry J. Voss
Director
(916) 445-7126

Attachment

cc: Lyn Hawkins
Don Mengle
H. Paul Lillebo
Ronald Oshima

SURNAME				
SO-106				

DEPARTMENT OF FOOD AND AGRICULTURE

Post Until
November 27, 1989

NOTICE OF DECISION CONCERNING THE DIRECTOR'S RESPONSE TO THE PREC SUBCOMMITTEE FINDINGS MADE PURSUANT TO THE PESTICIDE CONTAMINATION PREVENTION ACT REGARDING THE DETECTION OF ALDICARB IN GROUND WATER

Section 13150 of the Pesticide Contamination Prevention Act (Article 15, Chapter 2, Division 7 of the Food and Agricultural Code) requires the Director of the Department of Food and Agriculture to respond to the findings of the Pesticide Registration and Evaluation Committee (PREC) subcommittee within 30 days of the PREC Subcommittee finding issuance. The findings and recommendations of the PREC Subcommittee, entitled "Implementation of the Pesticide Contamination Prevention Act, Aldicarb: Findings and Recommendations" were transmitted to the Department on September 28, 1989. Both majority and minority findings were submitted. References herein to "the subcommittee" are intended to be references to the majority position.

The subcommittee found that: a) aldicarb and its degradation products have polluted, and continue to threaten to pollute, the ground waters of the State; b) no modified agricultural uses of aldicarb have been identified which would result in a high probability that aldicarb would not pollute the ground waters of the State; and c) that cancellation of aldicarb will not cause severe economic hardship on the State's agricultural industry.

After carefully reviewing all available data, including the findings and recommendations of the PREC Subcommittee, the Director has determined, pursuant to paragraph (4) of subdivision (d) of Section 13150, that contrary to the findings of the subcommittee, no pollution or threat of pollution exists.

<u>Reasons for the Decision and Differences with the Subcommittee's Findings</u>:

1. The subcommittee found that aldicarb and its degradation products have polluted, and continue to threaten to pollute the ground waters of the State. They found it likely that current use practices have polluted and continue to pollute extensive areas of California ground water and that due to lack of monitoring for aldicarb in areas of heavy use, it is not possible to define the full extent to which pollution has occurred.

The Director has determined that aldicarb has not polluted and does not threaten to pollute California's ground water because neither aldicarb nor its degradation products (aldicarb sulfoxide and aldicarb sulfone) have been detected in ground water as a result of legal label applications in any California county where aldicarb is currently registered for use. Contrary to the subcommittee's interpretation of available sampling data, the well monitoring data

contained in the Department's Well Inventory Data Base show that, in fact, nearly 500 wells have been sampled for aldicarb in 27 counties with currently registered aldicarb use. None of these wells contain residues of aldicarb or its breakdown products. In addition, the Department recently conducted a survey of 49 wells in areas of highest aldicarb use (cotton and sugarbeet-growing areas) in nine counties. None of these wells contained residues of aldicarb or its breakdown products, although some of these wells did contain residues of at least one of the previously-determined leachers (i.e., atrazine, bromacil, diuron, prometon and simazine).

All monitoring results taken as a whole, including especially the additional monitoring, show that ground water contamination from aldicarb use does not exist.

The subcommittee's finding that aldicarb has polluted and continues to threaten to pollute ground water was partly based on sampling results from Humboldt and Del Norte Counties. However, the results from Humboldt and Del Norte Counties are not applicable in this decision because aldicarb is no longer registered for ground application in either county, and has not been legal to apply for any outdoor use in either county since 1986.

Prior to 1986, aldicarb leached to ground water in Humboldt and Del Norte Counties under conditions of a relatively cool climate, coarse soils, high rainfall following aldicarb application, and shallow ground water. This unique combination of environmental conditions, which both decreases the potential degradation rate for aldicarb and increases its potential downward movement to ground water, does not occur in any other county where aldicarb is used. The Director has therefore determined that aldicarb does not threaten to pollute ground water in any county where aldicarb is registered for use because: 1) aldicarb is no longer registered for ground application in these two counties and; 2) the use pattern and conditions that resulted in ground water contamination in Humboldt and Del Norte Counties do not occur in any other California county.

The subcommittee's finding about aldicarb pollution was also based on experimental results from field degradation and movement tests conducted by the Registrant. It is inappropriate to use these experimental results for assessing the leaching potential of currently registered uses of aldicarb. These tests were conducted under conditions of a research authorization issued by the Director. Research authorizations are issued prior to any experimental, unregistered use of a pesticide and must be obtained by registrants who are developing field data to support potential new uses of a pesticide.

Data from these tests are used by the Department to evaluate new uses under the conditions specified and cannot be used to evaluate different uses under different conditions. In this case, and partly

based on the results of the tests, these experimental uses of aldicarb will not become legal uses through the registration process. Since such use is not and never will be allowed in California, using these test results to conclude that continued present registered uses of aldicarb will result in pollution or a threat of pollution to ground water is illogical.

Pollution is defined in Section 13141 (j) as "the introduction into the groundwaters of the state of an active ingredient, other specified product, or degradation product of an active ingredient of an economic poison above a level, with an adequate margin of safety, that does not cause adverse health effects." In order to determine whether the active ingredient has polluted, it must be found in the ground water in an amount that falls within the definition of pollution as so stated. Even if the exact amount may be debated among scientists, no scientist could argue that an adverse health effect is present when there is no active ingredient in the water.

Furthermore, aldicarb has been used extensively and for a long time in the areas where the additional testing was done. If it has not travelled to ground water up to this time, there is no reason to believe that it will in the future. Therefore, I am confident in finding that aldicarb has not polluted nor does it threaten to pollute the ground waters of this state.

2. The subcommittee's finding that aldicarb pollutes and threatens to pollute ground water led them to address the issue of modification of use. They found that use could not be modified to ensure that ground water would not be polluted.

While the Director is not required to develop a modification strategy in this case, it should be noted that he disagrees with the subcommittee's "no modification". Aldicarb's chemical properties, in combination with associated cultural practices and irrigation considerations, allow for modifications of use so that there is a high probability that pollution would not occur. This conclusion is based on the following:

a. Both rainfall and irrigation water can move pesticides through soil to ground water. The amount of irrigation water can be controlled to prevent deep percolation of water, and with it, pesticide leaching. Applying aldicarb at time of planting, in conjunction with using a water budget method of irrigation, has been demonstrated to reduce aldicarb leaching through soil (Wyman et al., 1985). Other researchers have also looked at timing of aldicarb applications and various methods of irrigation that could reduce aldicarb leaching through soil (Jones et al., 1986a; Elgindi et al., 1978).

   Using a water budgeting method of irrigation means to provide only that amount of water used by the crop. Any excess water that

could potentially transport pesticides from the crop root zone to ground water would not be available, and thus pesticide leaching could be minimized.

To minimize leaching from rainfall, timing of applications in relation to seasonal rainfall can be controlled. To this extent, fall applications can be restricted. This would be effective in California because most rainfall occurs in the state during the winter months.

b. Degradative processes such as degradation by microorganisms and hydrolysis can rapidly reduce aldicarb concentration in soil (Dierberg and Given, 1986; Jones et al., 1986b; Ou et al., 1985). Degradation rates by microbial oxidation and chemical hydrolysis are higher in surface and shallow subsurface soils that comprise the crop root zone and the soil microbial zone. Aldicarb can be kept in these zones of more rapid degradation by providing only that amount of water necessary for crop growth.

c. Published studies indicate that aldicarb has measurable adsorbance in various soils (Awad et al., 1984; Bromilow et al., 1980), which impedes its downward movement in soil.

d. Additionally, being systemic, aldicarb is absorbed from the soil by the plant's root system, and moves to the stem and leaves of the plant being protected. Thus, the amount of aldicarb available in the soil for leaching is further reduced by the crop itself (Dejonckheere at al., 1983; Singh et al., 1981).

e. Two independently-developed computer models rank aldicarb as having less potential to move to ground water than other pesticides for which the subcommittee has previously recommended that use can be modified so that there is a high probability that pollution would not occur. (Jury et al., 1987; Rao et al., 1985). Both models utilize the pesticides' chemical properties to partially determine their leaching potential.

3. The subcommittee found that cancellation of aldicarb will not cause severe economic hardship on the State's agricultural industry. Since the Director has determined that no pollution or threat to pollution exists, he did not conduct extensive research regarding this issue. However, growers, entomologists, and University of California Farm Advisors have begun to assemble substantial evidence that indicates that the cancellation of aldicarb would have a serious economic impact, especially in certain regions where cotton and sugar beets are grown. They argue that:

a. In general, aldicarb is an important pesticide because it is effective in providing a broad spectrum of pest control.

b. Aldicarb works systemically within the plant and has a minimum impact on beneficial insects, reducing the need for repeated pesticide applications.

c. Fewer pesticide applications means more efficient crop production and a reduced potential for problems with: drift; worker exposure to pesticides during mixing, loading, and application operations; public exposure in general.

d. Thus, aldicarb can fit well into integrated pest management and sustainable agriculture programs.

e. In desert cotton, aldicarb is the only pesticide effective against a new cotton disease called Cotton Transpiration Stress Syndrome that has caused serious yield losses. Its use to control 12 other economic pests in the Imperial Valley is an integral part of the one-set system adopted by growers two years ago to reduce pink bollworm populations that have devastated the desert cotton industry.

f. In sugar beets, aldicarb use is becoming a critical replacement for pesticides that no longer effectively control the insect vectors of virus diseases that cause dramatic yield reductions.

Department Actions:

Even though the Director has determined that no pollution or threat of pollution exists from the currently registered uses of aldicarb, the Department will take the following prudent actions to comply with the "preventative spirit" of the Act:

A. By regulation, the Department will further restrict the use of aldicarb by reducing the amount allowed per acre by 50% on all crops. The Department will also not allow fall application of aldicarb on any crop.

B. The Department will continue field studies to identify factors influencing pesticide leaching and incorporate findings into the ground water protection training program.

C. The Department will develop a well-head protection program to prevent direct point source contamination of ground water.

D. The Department will continue to monitor ground water for pesticides in order to protect this vital resource.

Henry J. Voss
Director

10-27-89
Date

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