

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Bascietto

DATE:

4/11/80

SUBJECT: Evaluation of Resubmission of the Section 18 emergency exemption for use of Aldicarb on Grapefruit in Texas.

FROM: John J. Bascietto, Wildlife Biologist, EEB, Section 1 (TS-769)

TO: Patricia Critchlow, Emergency Response Section, RD

THRU: Raymond W. Matheny, Head Section 1, EEB/HED

THRU: Clayton Bushong, Chief, EEB/HED

The Ecological Effects Branch has received and reviewed the re-submission of the Section 18 emergency exemption request for the use of Temik 15 G (aldicarb pesticide) on grapefruit in Texas. This action was previously reviewed by EEB (Bascietto, 2/6/80). The hazards to shrimp fisheries of the Laguna Madre Bay estuaries attendant with this Section 18 were discussed in EEB's 2/29/80 memo to you from J. Bascietto and R. Hitch.

The information we reviewed supporting this request for reconsideration was contained in a letter to Mr. Johnson from the Texas Dept. of Agriculture, dated April 1, 1980. EEB finds nothing in this information to indicate mitigation of the hazards to shrimp. The following points are of particular concern to our findings:

1. Texas admits that aldicarb leaches in sand. Hidalgo Clay Sandy Loam (the soil involved) is 55% sand. The problems of leaching, runoff, and groundwater contamination with aldicarb residues are addressed by the Environmental Fate Branch in their previous reviews and re-evaluations of this use. The potential problems with residue transport stem, in this case, from the leaching of the pesticide through the soils into the tile drain system, with subsequent lateral movement, via that system, to the Gulf. Leaching of aldicarb into groundwater aquifers, although certainly a factor in aldicarb's overall problems, is not the major route of residue transport with respect to contamination of the Laguna Madre fishery. (Texas may have been misled on this point by the wording in paragraph number 2 (pg 1 of 3) of Mr. Johnson's mailgram denial of the original Section 18.).
2. The estimated environmental concentration (EEC) of aldicarb in the Laguna Madre Bay resulting from this use, was very conservatively calculated. It was based, in part; on an observed field correlation between nitrate and aldicarb runoff percentages in tile-drained systems on Long Island (see EFB "re-evaluation of EUP- 41326-1, memo of 4/2/80 to F. Sanders, RD, from R. Carsel, EFB). The percent runoff used was conservative at 35%, rather than the 100% figure implied by the letter from the Texas Dept. of Agriculture.
3. The half-life of aldicarb under the agricultural, and tile-drain system conditions in question has been estimated and reaffirmed by EFB scientists as being 160-200 days. Therefore, the argument citing degradation over time required to travel the 40-60 mile distance to the Gulf Coast from the citrus orchards, is of no consequence.

The EEC of aldicarb in the Gulf of Mexico was calculated by the State of Texas to be 10ppb at most. This is erroneous. Certain inadequacies in the logic used in arriving at that figure become apparent if one considers the following:

- a. application rate for this use is 10 lb. a.i./acre, not 5 lb. a.i./acre as shown by Texas.
 - b. the application area is 23,900 acres, or 50% of the total grapefruit acreage; not 2% as used by Texas. (The 2% figure probably refers to 2% of the Tri-county area involved - this is inappropriate for EEC calculation).
 - c. EEB assumed 35% runoff, not 100% as stated in letter from Texas. No indication of % runoff used by Texas in figuring the 10 ppb level was evident.
 - d. the contribution from leaching of aldicarb into groundwater was not used in our calculated EEC (Texas is claiming that 100% leachability may have been used in figuring the EEC).
 - e. the EEC we calculated, i.e., 60 ppb, was for the Laguna Madre Bay shrimp fishery, not for the Gulf of Mexico as was implied when Texas pointed out that a "dilution of an incalculable amount would occur at the point where these drainage waters entered the Gulf. The dilution factor was, in fact, quite calculable within the limits of the area in question were clearly defined in our hazard assessment of 2/29/80. The actual calculations are included in that assessment.
5. Finally, the letter from the Texas Dept. of Agriculture contains some erroneous toxicity data for aldicarb tested shrimp. The source of this data was inadequately cited, so that it is impossible to recover or validate. A comparison of toxicity data follows.

Table 1. Texas Aldicarb Toxicity Data for Shrimp (considered by EEB as erroneous)

<u>Species</u>	<u>Toxicity</u>
<u>Palaemonetes kadiakensis</u>	*NEL = 1,000 ppb (1 ppm)
<u>P. pugio</u>	LC50 = 100 ppb
<u>Panaeus duorarum</u>	NEL = 10 ppb

*NEL = no effect level

Tables 2&3 below show data which EEB will consider in hazard assessments for aldicarb.

Table 2

Toxicity of Aldicarb to Estuarine

Organisms

Static Test :EC50 or LC50 (ppb)

Algae	-	5X10 ⁴	(EPA, Gulf Breeze Data)
Oyster (Larval)	-	8,800	(EG & G data)
Mysid Shrimp	-	13	(EPA, GBL data)
Penaeid shrimp	-	72	(" " ")
Pinfish (spot)	-	202	(" " ")
Sheepshead Minnow	-	168	(" " ")

Dynamic Test :LC50 (ppb)

Mysid shrimp	-	16	(EG & G data)
Penaeid shrimp	-	27	(" ")
Pinfish (spot)	-	218	(" ")
Sheepshead Minnow	-	111	(" ")

Chronic Toxicity - MATC (ppb)

Mysid shrimp	-	1	(EG & G data)
Grass shrimp (Palaemonetes spp.)	-	10	(" ")
Sheepshead Minnow	-	50	(" ")

TGG
BIO NOMICS

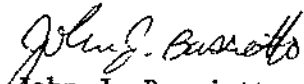
Table 3

EPA, Gulf Breeze Laboratory - LC50 data - estuarine organisms vs. - Aldicarb - Most recent testing (as of 2/28/80).

<u>Species</u>	<u>LC50 (ppb)</u>	<u>95% c.i. (ppb)</u>
Mysid shrimp	16	(13 - 20)
Pink Shrimp	12	(7.5-18)

As a result of our reconsideration of the Section 18 exemption request for use of aldicarb on Texas grapefruit, EEB can find no reason to modify the opinion expressed in the review of Bascietto (2/6/80) and the subsequent assessment of the hazard to shrimp fisheries in the Laguna Madre Bay.

EEB defers to EFB on the questions of aldicarb residue transport via the tile-drain system used in these citrus orchards, aldicarb leachability, runoff, and groundwater contamination. If, in their judgement, EFB feels that contamination of the Laguna Madre Bay is likely (at levels above 1 ppb), then EEB objects to the Section 18 based on unacceptable risk of adverse effects.


John J. Baschetto

cc: R. Carsel, EFB/HED