UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
PESTICIDES AND TOXIC
SUBSTANCES

MEMORANDUM

DEC - 3 1990

SUBJECT: Quinclorac New Chemical Registration Standard EFGWB Science Chapter

TO: Robert Taylor, Product Manager # 25
Registration Division (H7505C)

THRU: Henry Jacoby, Chief
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Environmental Fate and Effects Division

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Attached is the EFGWB Science Chapter for the Quinclorac New Chemical Registration Standard. It includes the Task 1 (Review of Individual Studies), Task 2 (Environmental Fate Summary and Ground Water Assessment) and the Data Table A, Subdivision N Environmental Fate Data Requirements.

The registrant submitted 30 environmental fate studies in support of the registration of quinclorac; however, no attempt was made to bridge the studies together into a coherent description of the environmental fate of quinclorac. Because of the many discrepancies between field and laboratory studies, as well as internal inconsistencies within studies, it is not possible for EFGWB to assess the environmental fate of quinclorac at this time.

The acceptable as well as supplemental laboratory data indicate that the compound is stable to hydrolysis, photolysis in sterile water, as well as aerobic and anaerobic metabolism. The leaching data indicate that the compound is mobile. Conversely, the submitted field studies indicate that quinclorac dissipates rapidly with little reported mobility in soil.

At the present time, because of the disparity in the results of submitted studies, EFGWB can not identify a route of dissipation of quinclorac in field situations. Possible routes of dissipation include plant uptake, leaching, chemical and

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biological degradation and surface runoff. As mentioned above, data from the field dissipation studies indicate that quinclorac dissipates rapidly when applied in the field. However, the authors of these studies have not proposed a route of dissipation. Until EFGWB has a better understanding of the route of dissipation of quinclorac, the environmental fate, ground water leaching and surface runoff assessments cannot be made.

Quinclorac is a selective herbicide being developed to control grasses and broadleaf weeds in [redacted] rice. Single active ingredient formulations include wettable powder, suspension concentrate and granular.

The following is based on registrant supplied use information. On rice quinclorac may be applied as a soil or foliar treatment using ground or air equipment. Proposed rates for shallow preplant incorporated, preemergence, delayed preemergence applications are 0.5-0.67 lb/A for coarse-textured soils, 0.67-0.75 lb/A for medium-textured soils, and 0.75-1.0 lb/A for fine-textured soils. Proposed rates for early postemergence applications are 0.5-1.0 lb/A. Quinclorac may also be tank mixed with other herbicides such as propanil or thiobencarb. No more than 1.0 lb/A of the 50% WP should be applied per season. Quinclorac should not be applied within 80 days of harvest. Small grain crops other than rice must not be planted for three months following application of quinclorac, and all other crops must not be planted for ten months following application of quinclorac.

[redacted]

The only data requirements that have been satisfied are hydrolysis, aerobic soil metabolism, leaching and adsorption/desorption and accumulation in fish.

The following studies are required to satisfy the Subdivision N Environmental Fate Data Requirements for use on aquatic food (rice) crops only: photodegradation in water, photodegradation on soil, anaerobic soil metabolism, anaerobic and aerobic aquatic metabolism, laboratory volatility, aquatic field dissipation, confined accumulation in rotational crops, and accumulation in irrigated crops.

The following studies are required to satisfy the Subdivision N Environmental Fate Data Requirements for use on

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terrestrial nonfood (turf) crops **only**: photodegradation in water, photodegradation on soil, anaerobic soil metabolism[1], laboratory volatility, and terrestrial field dissipation.

The following studies are reserved pending the results of other required studies: photodegradation in air, field volatility, long term soil dissipation, field accumulation in rotational crops, and accumulation in aquatic non-target organisms.

Since available data are insufficient, final environmental fate, ground water leaching and surface runoff assessments cannot be made; however, some preliminary estimations or potential risks summarized from submitted studies are as follows:

ENVIRONMENTAL FATE, GROUND WATER AND RUNOFF ASSESSMENTS

Based on submitted data, quinclorac is stable to hydrolysis at pH 5, 7, and 9. Under laboratory conditions, quinclorac degraded slowly (half-life >1 year) in soil incubated under aerobic conditions and quinclorac and its degradate 3-chloro-8-quinolinecarboxylic acid were very mobile in soil. Quinclorac residues did not accumulate in channel catfish.

EFGWB notes that this chemical and its primary degradate, 3-chloro-quinoline carboxylic acid, have some characteristics similar to those chemicals that have been detected in ground water (i.e., water solubility >30 ppm, K_ds <5.0, K_{oc}s <300-500, photolytic half-life >one week and soil half-life >2 to 3 weeks). These data imply that given sufficient time and use, this chemical has a high potential to leach into the ground water or undergo dissolved runoff to near surface water; therefore, the Ground Water and Surface Water Sections have been sent a copy of this memorandum.

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[1] An acceptable anaerobic aquatic study can substitute for this study.

TABLE A. GENERIC DATA REQUIREMENTS FOR QUINCLORAC

Data Requirement	Composition[1]	Use Pattern[2]	Does EPA have data to satisfy this requirement?	Bibliographic Citation	Must additional data be submitted under FIFRA Sec. 3(c)(2)(B)?[3]
40 CFR §158.290 Environmental Fate					
DEGRADATION STUDIES -- LAB:					
161-1. Hydrolysis	PAIRA	B,C	YES	40320816	NO
PHOTODEGRADATION:					
161-2. In Water	PAIRA	B,C	NO		YES[4]
161-3. On Soil	PAIRA	B,C	NO		YES
161-4. In Air	PAIRA	B,C	NO		RESERVED[5]
METABOLISM STUDIES:					
162-1. Aerobic Soil	PAIRA	B,C	YES	41247301	NO
162-2. Anaerobic Soil	PAIRA	B,C	NO		YES[6]
162-3. Anaerobic Aquatic	PAIRA	C	NO		YES

(Continued, footnotes follow)

TABLE A. GENERIC DATA REQUIREMENTS FOR QUINCLORAC (Continued).

Data Requirement		Composition	Use Pattern	Does EPA have data to satisfy this requirement?	Bibliographic Citation	Must additional data be submitted under FIFRA Sec. 3(c)(2)(B)?
40 CFR §158.290 Environmental Fate						
162-4.	Aerobic Aquatic	PAIRA	C	NO		YES
MOBILITY STUDIES:						
163-1	Leaching and Adsorption/Desorption	PAIRA	B,C	YES	41063562, 41063563	NO[7]
163-2	Volatility (Lab)	TEP	B,C	NO		YES
163-3	Volatility (Field)	TEP	B,C	NO		RESERVED[5]
DISSIPATION STUDIES -- FIELD:						
164-1	Soil	TEP	B	NO		YES
164-2	Aquatic (Sediment)	TEP	C	NO		YES
164-3	Forestry	TEP	NA			NO
164-4	Combination and Tank Mixes	TEP	NA			NO
164-5	Soil, Long-Term	TEP	B,C	NO		RESERVED[8]
ACCUMULATION STUDIES:						
165-1	Rotational Crops (Confined)	PAIRA	C	NO		YES

(Continued, footnotes follow)

TABLE A. GENERIC DATA REQUIREMENTS FOR QUINCLORAC (Continued).

Data Requirement		Composition	Use Pattern	Does EPA have data to satisfy this requirement?	Bibliographic Citation	Must additional data be submitted under FIFRA Sec. 3(c)(2)(B)?
40 CFR §158.290 Environmental Fate						
165-2	Rotational Crops (Field)	TEP	C	NO		RESERVED[9]
165-3	Irrigated Crops	TEP	C	NO		YES
165-4	In Fish	PAIRA	B,C	YES	40320819	NO[10]
165-5	In Aquatic Non-Target Organisms	TEP	B,C	NO		NO[11]
GROUNDWATER MONITORING:						
166-1.	Small Prospect.	NONE		NO	NONE	RESERVED[12]
166-2.	Small Retrosp.	NONE		NO	NONE	NO
166-3.	Large Retrosp.	NONE		NO	NONE	NO
SURFACE WATER:						
167-1.	Field Runoff	NONE		NO	NONE	RESERVED[13]
167-2.	Surface Water Monitoring	NONE		NO	NONE	RESERVED[13]

TABLE A. GENERIC DATA REQUIREMENTS FOR QUINCLORAC (Continued).

Data Requirement		Composition	Use Pattern	Does EPA have data to satisfy this requirement?	Bibliographic Citation	Must additional data be submitted under FIFRA Sec. 3(c)(2)(B)?
40 CFR §158.290 Environmental Fate						
40 CFR §158.440 SPRAY DRIFT						
202-1	Drift-Field Evaluation	TEP	B,C	NO		RESERVED[14]
202-1	Drift-Size Spectrum	TEP	B,C	NO		RESERVED[14]

FOOTNOTES:

1. TGAI = Technical Grade of the Active Ingredient; PAIRA = Pure Active Ingredient, Radiolabeled; TEP = Typical End Use Product.

2. The use patterns are coded as follows: A = terrestrial food crop; B = terrestrial non-food; C = aquatic food crop; D = aquatic non-food; E = greenhouse food crop; F = greenhouse non-food; G = forestry; H = domestic outdoor; I = indoor; J = indirect discharge aquatic use; and NA = not applicable.

3. Data must be submitted no later than _____.

4. Three aqueous photolysis studies were reviewed and found unacceptable because of the disparity between studies. In one study, little degradation of quinclorac occurred after 29 days of photolysis in sterile water. Conversely, the other two studies showed half-lives of 5 and 10 days in nonsterile natural waters.

5. The data requirement is deferred pending the receipt of acceptable laboratory volatility data.

6. An acceptable anaerobic aquatic study can substitute for the anaerobic soil metabolism study. EFGWB prefers the submission of an anerobic aquatic metabolism study.

7. The data requirement has been fulfilled by studies of the mobility of quinclorac and the degradate 3-chloro-8-quinolinecarboxylic acid. If any additional quinclorac degradates are determined to be of toxicological concern, information on the mobility of these degradates may be required.

8. This study is reserved pending results of field dissipation studies.

9. This requirement is deferred pending receipt of acceptable accumulation studies in confined rotational crops.

10. The data requirement has been fulfilled by studies of the accumulation of quinclorac in catfish. If any additional quinclorac degradates are determined to be of toxicological concern, information on the accumulation of these degradates in fish may be required.

11. No data are required because quinclorac did not accumulate in fish under laboratory conditions. However, if any additional quinclorac degradates are determined to be of toxicological concern, information on the accumulation of these degradates in aquatic non-target organisms may be required.

12. Ground water monitoring studies are reserved pending receipt of acceptable environmental fate studies.

13. If projected aquatic residues, based on modeling scenarios, are of environmental concern, then these studies may be required.

14. In general, droplet spectrum and field spray drift information will be required if one of the following criteria are met:

1. Human exposure - The chemical is classified as being Toxicity Category I or II for human acute inhalation or dermal effects studies;

2. Aquatic animal wildlife exposure - The chemical is used in close proximity to aquatic systems and five percent of the applied quantity yields a greater than ten percent mortality for aquatic animal species. This is based on the fact that about one to five percent of an applied pesticide can drift 100 yards (100 meters) in a ten knot (4.5 m/s) wind when applied about ten feet above the crop canopy. Terrestrial wild animal situations are based on human toxicity criteria given above; or

3. Wild and cultivated plant exposure - The chemical is used in close proximity to sensitive plants, as noted in phytotoxicity testing, including endangered and threatened species, that may be found within 100 to 500 yards (100 to 500 meters) downwind.

QUINCLORAC

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INTRODUCTION

Quinclorac is a selective herbicide being developed to control grasses and broadleaf weeds in [redacted] rice. Single active ingredient formulations include wettable powder, suspension concentrate and granular.

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