US EPA ARCHIVE DOCUMENT

11-12-93

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

MEMORANDUM

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

SUBJECT: Ecological Effects Review of Hexaflumuron for Registration as a Termiticide in a "Safer Pesticide" Formulation. EPA File Symbol: 62719-EUU, Chemical: 118202, DP Barcode D192426, Action: 115, NC-non-food/feed.

FROM: Anthony F. Maciorowski, Chief
Ecological Effects Branch
Environmental Fate and Effects Division (H7507C)

TO: Adam Heyward, Acting PM-10 & Marion Johnson
Insecticide-Rodenticide Branch
Registration Division (H7505C)

The very low use rate and contained use pattern of hexaflumuron for termite control are major factors considered in the risk assessment. The applicant has submitted seven studies, five of which were determined to be of core adequacy. The two freshwater fish LC_{50} data requirements were determined to be of supplemental adequacy because of difficulty in keeping the test material in solution or suspension due to its low solubility of 27 ppb. The fish toxicity data was sufficient to indicate no acute toxicity at concentrations equal to or below solubility. The acute freshwater invertebrate LC_{50} on *Daphnia magna* gave an LC_{50} value of 0.111 ug/l which classifies XRD 473 as very highly toxic to aquatic invertebrates. With very high toxicity to aquatic invertebrates and possible toxicity to fish, it is recommended that the labeling statements prohibiting application to water as provided in PR Notices 93-3 and 93-8 be required on the label under "Environmental Hazards" with the further addition of the risk management statements: "This product is highly toxic to aquatic invertebrates and possibly fish. The termite bait stations should not be placed in depressions or low areas that may be flooded or near downspout openings. They should not be used near ponds, streams, springs or other water sources where the bait or its hexaflumuron contents could be washed out of the plastic containers into water at or near the surface of the ground."

On the basis of the recommended mitigating label language recommended (due to the very high toxicity to aquatic invertebrates), the low use rate and the contained use pattern, it

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is recommended that further freshwater fish LC_{50} data requirements be waived. The mitigating label language, low use rate and contained use pattern would be appropriate risk management measures should a risk of high toxicity to freshwater fish exists. EEB recommends registration accordingly.

EEB BRANCH REVIEW

PESTICIDE NAME: HEXAFLUMURON DowElanco DE-473 INSECTICIDE

100 Submission Purpose and Label Information:

Ecological Effects Review of Hexaflumuron for Registration as a Termiticide in a "Safer Pesticide" Formulation. EPA File Symbol: 62719-EUU, Chemical: 118202, DP Barcode D192426, Action: 115, NC-non-food/feed. No end use product draft label was submitted. A manufacturing use product draft label only was submitted.

100.1 Submission Purpose and Pesticide Use:

FIFRA Section 3, registration of pesticide ecological effects data and waiver request submission.

100.2 Formulation Information:

a. Active ingredient:
The active ingredient is hexaflumuron (1-(((3,5-dichloro-4(1,1,2,2-tetrafluoroethoxy)phenyl)amino)carbonyl)2,6-difluorobenzamide, identified by DowElanco as DE-473 (also XRD 473) for the technical grade active ingredient and NAF-46 as formulated termite bait. It is a benzoylphenyl urea compound which inhibits the synthesis of chitin, a component of the insect exoskeleton causing inability to molt followed by death. Its mode of action is slow and allows a large number of workers to feed on the bait. A decline in the number of workers is followed by a collapse of the colony because there are not enough workers to support dependent castes.

The unique method of this product's use is also of consideration for greatly reducing ecological effects and consists of the following:

b. Bait station:
The bait formulation is contained within a 1.5 inch/3.8 cm by 8 inch/20.4 cm clear plastic tube with about 56 holes large enough to allow a worker termite to pass. The tube is inserted into a sturdy plastic outer tube or holder that has 44 large slots to facilitate access to the inner tube. The outer tube locks in a child proof way with a simple key mechanism to its cap onto a circular top plate 6 3/8 inch/16.2 cm in diameter. The sturdy plastic outer tube is put into the ground at various intervals and in likely places around susceptible wood structures so that the top plate rests on the soil surface.

c. Bait formulation:
The bait formulation consists of a [redacted] dough like substrate with 0.1% active ingredient upon which termites feed.

INERT INGREDIENT INFORMATION IS NOT INCLUDED

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Each tube contains 150 mg of active ingredient. A typical structure would utilize approximately 10 to 20 bait stations. Using the highest estimate, a total of 3 g of haxaflumuron would be used per structure. In addition, hexaflumuron is utilized only when termite activity is detected by monitoring.

100.3 Application Methods, Directions, Rates:

The unique mode of action is of consideration for reducing adverse ecological effects and is as follows:

a. Method of use:

The tube containing the bait is placed into the underground bait station only after termites are detected. Once the population is suppressed or eradicated and no further feeding is observed, the clear plastic bait tubes are replaced with monitoring devices consisting of two strips of wood stapled loosely together along one edge of each piece. These devices are checked occasionally for the presence of termites. If there are termites feeding on the monitoring device, they are replaced with the bait tube.

b. Advantages:

Termite control practices until now entail placing up to 12 to 16 pounds of active ingredient like Dursban®, chlorpyrophos, synthetic pyrethroids diluted with water and more recently foam placed in soil around typical structures to form a barrier to foraging termites. This has typically been "trenched" and "rodded" under pressure into place resulting in numerous indoor and outdoor contamination problems. The baiting system would not totally replace chemical barrier treatments, but its use could be significant. Liquid termiticides could still be used as a spot application to treat the area where termites enter a building, but this would involve much less termiticide than would be required if conventional termiticides are used to establish a full barrier around a structure. The hexaflumuron bait system minimizes exposure to any organism other than the target pest. Also, the cellulose based matrix and subterranean placement further serve to make the system relatively species specific.

100.4 Target Organisms:

Native subterranean and introduced Formosan termites.

100.5 Precautionary Labeling:

No end use product draft label was submitted. A manufacturing use product draft label was submitted. With very high toxicity to aquatic invertebrates and possible toxicity to freshwater fish, it is recommended that the labeling statements prohibiting application to water as provided in PR Notices 93-3 and 93-8 be required on the label under "Environmental Hazards" with the further addition of the risk management statements: "This product is highly toxic to

aquatic invertebrates and possibly fish. The termite bait stations should not be placed in depressions or low areas that may be flooded or near downspout openings. They should not be used near ponds, streams, springs or other water sources where the bait or its hexaflumuron contents could be washed out of the plastic containers into water at or near the surface of the ground."

101 Hazard Assessment:

Hexaflumuron has a low water solubility of 27 ppb, binds strongly with the [redacted] bait with a Kd = 147-1326 and has little potential for leaching from the bait formulation. The bait container further minimizes exposure potential. On the basis of all of the above, the applicant has requested waiver of the data requirements. However, MRID #'s 42648507-13 were submitted for review.

101.1 Discussion:

The very low use rate and contained use pattern of hexaflumuron for termite control are major factors for ecological effects risk assessment. The applicant has submitted seven studies, five of which were determined to be of core adequacy. The two freshwater fish LC_{50} data requirements were determined to be of supplemental adequacy because of difficulty in keeping the test material in solution or suspension due to its low solubility of 27 ppb. The fish data was sufficient to indicate no acute toxicity at concentrations equal to or below solubility. The acute freshwater invertebrate LC_{50} on *Daphnia magna* gave an LC_{50} value of 0.111 ug/l which classifies XRD 473 as very highly toxic to aquatic invertebrates.

On the basis of the recommended mitigating label language (due to the very high toxicity to aquatic invertebrates), the low use rate and the contained use pattern, it is recommended that further freshwater fish LC_{50} data requirements be waived. The mitigating label language, low use rate and contained use pattern would be appropriate risk management measures should a risk of high toxicity to freshwater fish exist. The other ecological effects data requirements have been met with core grade studies. EEB recommends registration accordingly.

101.2 Likelihood of Adverse Effects to Nontarget Organisms:

Hexaflumuron is applied at very low rate of up to about 3 grams per structure or treatment site and is contained in an underground bait station on a bait that is specifically attractive to worker termites. Minimal toxicity to birds has been shown by testing and there is practically no likelihood of avian exposure if the product is used as intended. There is very high toxicity to aquatic invertebrates and possible toxicity to fish, but the contained use of hexaflumuron would minimize exposure. Nevertheless, risk management is recommended in the form of

INERT INGREDIENT INFORMATION IS NOT INCLUDED

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prescribed mitigating label language to further reduce the likelihood of adverse effects on aquatic organisms. There is a substantial likelihood that soil arthropods will be adversely affected. Those groups most likely to be affected are Collembola (springtails), Diplopoda (millipedes), Isopoda (pill bugs, sow bugs, wood lice) and Acarina arachnids (mites). Effects on annelids (earth worms) and nematodes are unknown. Hexaflumuron is a benzoylphenyl urea class insect growth regulator that is selective to arthropods with a mode of action directed at interfering with cuticle deposition. In consideration of the use of the product, adverse impact on these organisms would be much less than expected from the use of conventional termiticides at their usual high rates of application. No additional risk management measures are recommended because they would interfere with the effective use of the product and adverse effects would be relatively minor compared to conventional treatments. Terrestrial species such as carabid ground beetles and amphibians would also have some opportunity for contact because of the construction of the container and the circular top plate which rests on the soil surface. This configuration is expected to encourage many soil and surface inhabiting macroorganisms to seek shelter under the top plate placing them in proximity to the hexaflumuron bait. However, no risk management measures are recommended because they would interfere with the use of the product. The likelihood of significant effects is far less than from use of conventional termiticides.

101.3 Endangered Species Considerations:

Containment of hexaflumuron in bait stations, placement of the station around man-made structures and use of hexaflumuron at very low rates minimizes the likelihood of adverse effects on endangered species.

101.4 Adequacy of Toxicity Data:

The standard CFR 40 158.490 wildlife and aquatic organism data requirements for hexaflumuron are the following:

Kind of Data Required	Guideline Ref. No.	Kind of Data Submitted Or Waiver Requested	Adequacy of Study
Avian Acute oral LD_{50}	71-1	42648507 Quail 42648508 Mallard Waiver Requested	Core Core
Avian Dietary Dietary LC_{50}	71-2	42648509 Quail 42648510 Mallard Waiver Requested	Core Core
Freshwater Fish LC_{50}	72-1	42648511 Bluegill 42648512 Trout Waiver Requested*	Supplem. Supplem. Rec. Waive

4.

Acute LC_{50} Fresh-water invert.	72-2	42648513 *Daphnia* Waiver Requested	Core

* Waiver recommended for further freshwater fish data requirements on basis of 27 ppb solubility resulting in unclear test results, the very low use rate, the contained placement away from water and aquatic habitats and precautionary statements on the label due to high toxicity to aquatic invertebrates.

It is recommended that the CFR 40 158.540 plant protection data requirements in Guideline reference numbers 122-1 and 122-2 be waived because of the contained use pattern and low use rate of the product which are expected to preclude exposure to forests and grasslands. No phytotoxicity problems are expected.

Review of data:

a. MRID # 42648507 is Acute Oral Toxicity (LD_{50}) of XRD 473 to the Bobwhite Quail: Summary Evaluation and Original Study, DowElanco Report No. DWC 510/871169 by Monte A. Mayes dated October 28, 1992. The original Study was by Nicholas L. Roberts and Christine N.K. Phillips of Huntingdon Research Centre Ltd., Huntingdon, Cambridgeshire, England dated August 26, 1987 and conducted for Dow Chemical Co. Ltd., Agricultural Products, R&D, Letcombe Laboratory, Wantage, Oxfordshire, England.

The original study concluded that the LD_{50} value of XRD 473 was found in excess of 2,000 mg/kg in the bobwhite quail. All birds remained in good health throughout the study and no clinical signs of toxicity were observed following dosing. No mortalities occurred and it was not possible to calculate and LD_{50} value. The summary evaluation additionally concluded the following: body weight gain based on day 0 and day 14 measurements of control and treated birds was considered to be within normal limits. Food consumption data were variable. There was no evidence of any treatment related effect for either weight gain or food consumption. No abnormalities were observed in a gross pathology examination. The Data Evaluation Record of this study concluded that the study is scientifically sound and meets the requirements for an acute oral toxicity test using the bobwhite quail. The LD_{50} value of >2,000 mg/kg of body weight by nominal concentration classifies hexaflumuron as practically nontoxic to bobwhite quail. The NOEL was 500 mg/kg. The adequacy of the study is core. EEB concurs with these determinations.

b. MRID # 42648408 is Acute Oral Toxicity (LD_{50}) of XRD 473 to the Mallard Duck: Summary Evaluation and Original Study, DowElanco Report No. DWC 494/861564 by Monte A. Mayes dated October 28, 1992. The original study was by Nicholas L. Roberts and Christine N.K. Phillips, Huntingdon Research Centre Ltd., Huntingdon, Cambrideshire, England, dated November 6, 1986 and conducted for Dow Chemical Europe, R&D, Bachtobelstrasse 3, 8810 Horgen, Switzerland.

The original study concluded that the LD_{50} of XRD 473 was found to be in excess of 2,000 mg/kg in the mallard duck. Birds in the group that received XRD at 2,000 mg/kg appeared to be slightly unsteady a few hours after dosing, but recovered completely by the end of day one. Otherwise, all birds remained in good health following dosing and no mortalities occurred. The summary evaluation concluded the following: Body weight gain based on day 0 and day 14 measurements of control and treated birds was considered to be within normal limits. Food consumption data were variable and related to spillage. There was no evidence of any treatment effect for either weight gain or food consumption. All birds at the 2,000 mg/kg dose level were examined at termination of the study and no abnormalities were found. The summary evaluation concluded that XRD-473 is practically nontoxic to the mallard. The data Evaluation Record for this study concluded that the study is scientifically sound and meets the requirements for an acute oral toxicity test using the mallard duck. The LD_{50} value of >2,000 mg/kg of body weight based on nominal concentration classifies hexaflumuron as practically nontoxic to the mallard duck. The NOEL was 1,000 mg/kg. Adequacy of the study is core. EEB concurs with these determinations.

c. MRID # 42648509 is The Dietary Toxicity of XRD 473 to the Bobwhite Quail: Summary Evaluation and Original Study, DowElanco Report No. DWC 511/871193 by Monte A. Mayes dated October 28, 1992. The original study was by Nicholas L. Roberts, Christine N.K. Phillips, Alan Anderson and I. Suzanne Dawe of Huntingdon Research Centre Ltd., Huntingdon, Cambridgeshire, England dated September 13, 1987 and conducted for Dow Chemical Co. Ltd., Agricultural Products, R&D, Letcombe Laboratory, Wantage, Oxfordshire, England.

The original study concluded that the dietary LC_{50} value for XRD 473 in the bobwhite quail was 4,786 ppm, with 95% confidence limits of 2,690 ppm to 28,381 ppm. The LC_{50} value of 4,786 ppm is equivalent to an intake of approximately 900 mg/kg/day over a five day period. There was some evidence of a depression of food consumption at 2,600 ppm and 5,200 ppm during the treatment period. Food consumption in these two groups increased again during the post-treatment period. No abnormalities were detected in any bird which died during the study or were sacrificed at termination. The summary evaluation concluded that the NOEL was 650 ppm and that XRD 473 is slightly toxic to the bobwhite quail. The Data Evaluation Record for this study concluded that the study is scientifically sound and meets the guideline requirements for an acute dietary avian study. The LC_{50} was recalculated using EPA's Toxanal program and found to be 2,201 ppm rather than 4,786 ppm which still indicates slight toxicity to the bobwhite quail. Adequacy of the study is core, EEB concurs with these determinations.

d. MRID # 42648510 is The Dietary Toxicity of XRD 473 to the Mallard Duck: Summary Evaluation and Original Study, DowElanco Report No. DWC 512/871194 by Monte A Mayes dated October 28, 1992.

The original study was by Nicholas L. Roberts and Christine N.K. Phillips, Alan Anderson and I. Suzanne Dawe of Huntingdon Research Centre Ltd., Huntingdon, Cambridgeshire, England, dated August 26, 1987 and conducted for Dow Chemical Co. Ltd. Agricultural Products R&D, Letcombe Laboratory, Wantage, Oxfordshire, England.

The original study concluded that, as no mortalities occurred in any of the test groups, it was not possible to calculate and LC_{50} value for XRD 473. The LC_{50} value for XRD in the mallard duck must therefore be in excess of 5,200 ppm. Food consumption at 5,200 ppm appeared to be low compared with the controls on day one and two of the treatment period. There was no other evidence of treatment-related effects on food consumption. In post-mortem examination, no abnormalities were detected in any of the high dose birds examined at termination of the study. The summary evaluation concluded that XRD 473 is practically nontoxic to the mallard. The Data Evaluation Record for this study concluded that the study is scientifically sound and meets the guideline requirements for an acute dietary avian study. The 8-day LC_{50} value of >5,200 ppm classifies hexaflumuron as practically nontoxic to the mallard duck. The NOEL was 2,600 ppm. Adequacy of the study is core. EEB concurs with these determinations.

e. MRID # 42648511, The Acute Toxicity of XRD 473 to Bluegill Sunfish: Summary Evaluation and Original Study, DowElanco Report No. 87/DCS032/556 by Monte A. Mayes dated October 28, 1992. The original study was by C.A. Willis of Aquatox, Life Science Research Ltd. Eye, Suffolk, England dated July 20, 1988 and conducted for Dow Chemical Co. Ltd, Agricultural Products R&D, Letcombe Laboratory, Wantage, Oxfordshire, England.

The conclusion of the original study was that XRD 473 is not acutely toxic to bluegill sunfish at concentrations of 500 ug/l in water, the highest initial concentration found in the first limit test, nor is it acutely toxic when added directly to water to give a nominal concentration of 100 mg/l. At the start of the first test in which XRD 473 was dispersed using DMSO, the analysis of test solutions indicated that exposure concentrations were between 93 and 109% of nominal at all levels except 100 ug/l which was 158% of nominal suggesting that the test material was not uniformly dispersed in the dilution medium. After 96 hours, concentrations had decreased to between 7.5 and 38% of nominal. All exposure concentrations exceeded the solubility of the test material in water (the test material is 27 ppb soluble in water). The summary evaluation concluded that the 96 hour LC_{50} was greater than the highest concentration tested or 500 ug/l and that the data indicated XRD 473 is practically nontoxic to the bluegill. The Data Evaluation Record for this study concluded that measured concentrations decreased substantially from test initiation to test termination. Therefore, the actual concentrations to which the test organisms were exposed are unknown. EEB review of the study took the low solubility of 27 ppb, the quality of the study and

usefulness of the information into consideration to classify the study as supplemental. The fish data was sufficient to indicate no acute toxicity at concentrations equal to or below solubility. The major factor for aquatic risk assessment is the use pattern of this product which greatly reduces potential for aquatic exposure.

f. MRID # 42648512 is The Acute Toxicity of XRD 473 to Rainbow Trout: Summary Evaluation and Original Study, DowElanco Report No: 87/DCS032/555 by Monte A. Mayes dated October 28, 1992. The original study was by C.A. Willis and J. O'Connor of Aquatox, Life Science Research Ltd., Eye, Suffolk, England dated December 18, 1987 and conducted for Dow Co. Ltd., Agricultural Products, R&D, Letcombe Laboratory, Wantage, Oxfordshire, England.

The original study concluded that XRD 473 was not acutely toxic to rainbow trout under the conditions of testing and at concentrations up to the maximum employed of 500 ug/l. This nominal concentration corresponds to 19 times the measured solubility of XRD 473 in distilled water. The test material was dissolved in DMSO. Analysis of test solutions at the start of the test indicated that exposure concentrations were between 106% and 150% of nominal. After 96 hours these values had decreased to between 63% and 78% of nominal. The summary evaluation concluded that the 96 hour LC_{50} is greater than the highest concentration tested of 500 ug/l and, under the proposed use conditions, these data indicate that XRD 473 does not represent a significant risk to rainbow trout. The Data Evaluation Record concluded that the study is scientifically sound, but does not meet the guideline requirements for an acute toxicity study using freshwater fish. The test concentrations were less than 100 mg/l, but not high enough to produce a precise LC_{50}. Based on mean measured concentrations, the 96-hour LC_{50} was >535.5 ug/l which classifies XRD 473 as highly toxic to *Salmo gairdneri*. The NOEC was 183.8 ug/l. The adequacy of the study was supplemental. EEB review of the study and the discrepant conclusions took the low solubility of the test material, the quality of the study and usefulness of the information into consideration to concur on the classification as supplemental. A major consideration for aquatic risk assessment is that the use pattern of this product greatly reduces potential for aquatic exposure.

g. MRID # 42648513 is The Acute Toxicity of XRD 473 to *Daphnia magna*: Summary Evaluation and Original Study, DowElanco Report No. AFT/86/009 by Monte A. Mayes dated October 28 1992. The original study was by C. A. Willis, Aquatox Ltd. Life Science Research, Eye, Suffolk, England dated July 20, 1988 and was done for Dow Chemical Europe, R&D, Bachtobelstrasse 3, 8810 Horgen, Switzerland.

The original study concluded that, under the conditions of the test, the 48 hour EC_{50} of XRD 473 to *Daphnia magna* was estimated to be 0.11 ug/l with 95% confidence limits of 0.10 and 0.12 ug/l. These concentrations are based on the concentrations determined by

radio-chemical analysis of samples taken from test solutions at low, medium and high exposure levels at the end of the test together with estimates derived from these measured values for the intermediate concentrations. The concentration of XRD 473 in test solutions analyzed at the start and end of the definitive test showed a decline in exposure concentrations during the test. Samples taken from the test vessels at the end of the test indicated that losses in concentrations were between 17% and 27% of the initial concentrations. The lowest concentration tested of 0.0303 ug/l was above the NOEC. The summary evaluation concluded that XRD 473 is very highly toxic to daphnids. The Data Evaluation Record concluded that the study is scientifically sound and meets the guideline requirements for an acute toxicity study using freshwater invertebrates. Based on measured and derived concentrations, the 48 hour LC_{50} was 0.111 ug/l which also classifies XRD 473 as very highly toxic to *Daphnia magna*. The NOEC could not be determined. Adequacy of the study was core. EEB concurs with these determinations.

101.5 Adequacy of Labeling:

With very high toxicity to aquatic invertebrates and possibly high toxicity to freshwater fish, it is recommended that the labeling statements prohibiting application to water as provided in PR Notices 93-3 and 93-8 be required on the label under "Environmental Hazards" with the further addition of the risk management statements: "This product is highly toxic to aquatic invertebrates and possibly fish. The termite bait stations should not be placed in depressions or low areas that may be flooded or near downspout openings. They should not be used near ponds, streams, springs or other water sources where the bait or its hexaflumuron contents could be washed out of the plastic containers into water at or near the surface of the ground."

102 Classification:

Five of the seven required studies were classified as core. Two of the studies were classified as supplemental due to the low solubility of the test material. However, these two studies provided useful information for the ecological risk assessment of hexaflumuron. It is recommended that further freshwater fish data requirements be waived based on low solubility and the risk mitigating precautionary label language recommended due to very high aquatic invertebrate toxicity.

103 Conclusions:

The very low use rate and contained use pattern of hexaflumuron for termite control are major factors considered in the ecological effects risks assessment. However, the applicant for registration has submitted seven studies, five of which were determined to be of core adequacy. The two freshwater fish LC_{50}

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data requirements were determined to be of supplemental adequacy because of difficulty in keeping the test material in solution or suspension due to its low solubility of 27 ppb. Fish toxicity data was sufficient to indicate no acute toxicity at concentrations equal to or below solubility. The acute freshwater invertebrate LC_{50} on *Daphnia magna* gave an LC_{50} value of 0.111 ug/l which classifies XRD 473 as very highly toxic to aquatic invertebrates.

On the basis of the mitigating label language recommended (due to the very high toxicity to aquatic invertebrates), the low use rate and the contained use pattern, it is recommended that further freshwater fish LC_{50} data requirements be waived. The mitigating label language, low use rate and contained use pattern would be appropriate risk management measures should a risk of high toxicity to freshwater fish exists. EEB recommends registration accordingly.

The study requirements are adequate for this particular low risk use method (containerized), but additional studies may be required for other outdoor use patterns posing higher exposure potential for aquatic organisms.

Attachments:

Data Evaluation Records for MRID No's 42648507 through 42648513.

Reviewed by: Robert I. Rose

Date: 27 OCT 1993

Ecological Effects Branch
Environmental Fate & Effects Division (H7507C)

Section I: For Leslie W. Touart, Head

Date: 11/9/93

Ecological Effects Branch
Environmental Fate & Effects Division (H7507C)

Branch: Anthony F. Maciorowski, Chief

Date: 11/12/93

Ecological Effects Branch
Environmental Fate & Effects Division (H7507C

DP Barcode : D192426
PC Code No : 118202
EEB Out :

To: Adam Heyward, Acting PM-10 & Marion Johnson
Insecticide-Rodenticide Branch
Registration Division (H7505C)

From: Anthony F. Maciorowski, Chief
Ecological Effects Branch
Environmental Fate and Effects Division (H7507C)

Attached, please find the EEB review of...
Reg./File # : 62719-EUU
Chemical Name : Hexaflumuron: N(((3,5-dichloro-4-(1,1,2,2,-tetrafluoroethoxy)phenyl)amino)carbonyl)-2,6-difluoro benzamide
Type Product : Insecticide: insect growth regulator, chitin synthesis inhibitor.
Product Name : DowElanco DE-473 Insecticide
Company Name : DowElanco
9002 Purdue Road
Quad IV
Indianapolis, Indiana 46268

Purpose : Complete full review of new chemical

Action Code : 115, NC-NON-FOOD/FEED USE

Reviewer : Robert I. Rose Date Due: 12/06/93
"Safer Pesticide"------Unofficial: 10/31/93

EEB Guideline/MRID Summary Table: The review in this package contains an evaluation of the following:

GDLN NO	MRID NO	CAT	GDLN NO	MRID NO	CAT	GLDN NO	MRID NO	CAT
71-1	42648507	C	71-2	42648510	C	72-2	42648513	C
71-1	42648508	C	72-1	42648511	S	122-1	None	N/A
71-2	42648509	C	72-1	42648512	S	122-2	None	M/A

Y=Acceptable (Study satisfied Guideline)/Concur
P=Partial (Study partially fulfilled Guideline, but additional information is needed
S=Supplemental (Study provided useful information, but Guideline was not satisfied)
N=Unacceptable (Study was rejected)/Nonconcur
N/A=Not applicable
OTHER/COMMENTS/CONCLUSION: The ecological effects data requirments have been met with the exception of two freshwater fish LC_{50} studies which are recommended to be waived because of product use pattern and mitigating precautionary label statements. EEB recommends registration accordingly.

DP Barcode : D192426
PC Code No : 118202
EEB Out : / /

To: Richard Mountfort
Product Manager 10
Registration Division (H7505C)

From: Anthony F. Maciorowski, Chief
Ecological Effects Branch/EFED (H7507C)

Attached, please find the EEB review of...

Reg./File # : 062719-EUU
Chemical Name : Hexaflumuron
Type Product : insecticide (IGR)
Product Name : DE-473
Company Name : DowElanco
Purpose : Complete full review of new chemical.

Action Code: 115 Date Due: 12/6/93
Reviewer: Robert Rose

EEB Guideline/MRID Summary Table: The review in this package contains an evaluation of the following:

GDLN NO	MRID NO	CAT	GDLN NO	MRID NO	CAT	GDLN NO	MRID NO	CAT
71-1(A)			72-2(A)			72-7(A)		
71-1(B)			72-2(B)			72-7(B)		
71-2(A)			72-3(A)			122-1(A)		
71-2(B)			72-3(B)			122-1(B)		
71-3			72-3(C)			122-2		
71-4(A)			72-3(D)			123-1(A)		
71-4(B)			72-3(E)			123-1(B)		
71-5(A)			72-3(F)			123-2		
71-5(B)			72-4(A)			124-1		
72-1(A)			72-4(B)			124-2		
72-1(B)			72-5			141-1		
72-1(C)			72-6			141-2		
72-1(D)						141-5		

Y=Acceptable (Study satisfied Guideline)/Concur
P=Partial (Study partially fulfilled Guideline but additional information is needed
S=Supplemental (Study provided useful information but Guideline was not satisfied)
N=Unacceptable (Study was rejected)/Nonconcur