UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

OFFICE OF PREVENTION, PESTICIDES AND TOXIC SUBSTANCE

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MEMORANDUM

SUBJECT: Data Submission in support of the Proposed New Uses of the Chemical Penoxsulam on Turf and Aquatic Weeds

CAS Registry Number: 219714-96-2

End Use Products: GF-443 SC (liquid product containing 21.7% active ingredient; EPA Reg. No. 62719-LUH);
GF-907 37.5 g/l SC (liquid product containing 3.68% active ingredient; EPA Reg. No. 62719-LUT);
Penoxsulam GR 0.04% (granular product containing 0.04% active ingredient; EPA Reg. No. 62719-LLN);
Penoxsulam FERT 0.04% (granular product containing 0.04% active ingredient and fertilizer; EPA Reg. No. 62719 LUO);
Penoxsulam GR 0.014% (granular product containing 0.014% active ingredient; EPA Reg. No. 62719-LUG);
Penoxsulam FERT 0.014% (granular product containing 0.014% active ingredient and fertilizer; EPA Reg. No. 62719-LUI)
GF-443 SC (liquid product containing 21.7% active ingredient; EPA Reg. No. 62719-LUH)

MRID #s
46703501
46703502
46703503
46433901
46433902

Company: Dow AgroSciences, LLC

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This memorandum transmits three studies submitted in support of the proposed new uses of the post emergence herbicide, Penoxsulam, on established turf and on submerged, floating or emergent aquatic weeds. Brief summaries of these studies appear below.

Aquatic Field Dissipation ***MRID 46703503, Guideline 164-2***
Study Classification - Supplemental

Penoxsulam was applied four times, at approximately 28-day intervals by subsurface injection, to a 1.2-ha application zone of an approximately 12.2-ha lake in Florida. Each application was made to achieve a whole-lake water concentration of approximately 20 µg penoxsulam/L. The maximum proposed single use rate was reported as 150 µg penoxsulam/L. The fourth application was made concurrently with the conservative tracer Rhodamine WT dye to determine the three-dimensional dispersal pattern in the lake water. Water and sediment samples were collected for analysis of penoxsulam only. Composite water samples were collected within 1.5-6 hours following each application in an attempt to estimate the penoxsulam application rate. Water samples (both mid-depth in the water column and 25 cm from lake bottom) were then collected from nine sampling locations at approximately 1, 3, 7, 10, 20, and 27 days after the first three applications, and at 1, 3, 7, 11, 21, 28, 43, 55, 83, 109, 137, 167, and 210 days after the fourth application. Samples were also collected from three additional sampling stations installed prior to the fourth application, within the emergent vegetation zone of the lake. Sediment samples were collected at the same sampling intervals for water. All samples were analyzed within 349 days of collection.

The Rhodamine WT dye dispersion analysis results indicated that Rhodamine dye had become widely dispersed throughout the lake by 6 hours posttreatment, and that complete lateral and vertical mixing was achieved by approximately 1 day posttreatment.

Penoxsulam dissipated in the water with calculated half-lives of 15.4 days ($r^2 = 0.9849$), 11.0 days, 12.1 days, and 11.7 days following each of the four applications, respectively, calculated using linear regression analysis performed on a plot of ln-transformed penoxsulam concentrations vs. time and the equation $t_{1/2} = -ln\ 2 / k$, where k is the rate constant.

Penoxsulam concentrations in water, expressed as ng/mL. Penoxsulam dissipated in the sediment with calculated half-lives of 8.2 days, 12.9 days, 7.8 days, and 21.7 days following the four applications, respectively, calculated using linear regression analysis performed on a plot of ln-transformed penoxsulam concentrations vs. time and the equation $t_{1/2} = -ln\ 2 / k$, where k is the rate constant.

Penoxsulam concentrations in sediment mirrored those seen in the water. The authors stated that water quality parameters (pH range of approximately 6-8; dissolved oxygen range of 0.6-13.5 mg/L; conductivity range of 0.03 to 0.05 mS/cm) were typical of Florida lakes and that visibility readings indicated that the lake moved from a eutrophic state to a hypereutrophic state during the course of the study.

Stability in Soil ***MRID 46433902, Non-Guideline***
Study Classification - Acceptable

A storage stability study was conducted by fortifying control soil from California with penoxsulam and the transformation products 5-OH (6-(2,2-difluoroethoxy)-N-(5,6-dihydro-8-methoxy-5-oxo-s-triazolo[1,5-c]pyrimidin-2-yl)-α,α,α-trifluoro-o-toluene sulfonamide); BSTCA (3-[6-(2,2-difluoroethoxy)- α,α,α-trifluoro-o-toluenesulfonamido]-s-triazole-5-carboxylic acid); BSA (2-(2,2-difluoroethoxy)-6-(trifluoromethyl)benzenesulfonic acid); XDE-638 sulfonamide (2-(2,2-difluoroethoxy)-6-(trifluoromethyl)-benzenesulfonamide); and, 2-amino-TP (2-amino-5,8-dimethoxy-s-triazolo[1,5-c]pyrimidine), at 0.03 μg/g, with subsequent analysis following 0, 91, 182, 196, 327, 594, and 781 days of frozen storage.

Storage stability results indicate that penoxsulam and the transformation products 5-OH, sulfonamide, and BSA were stable for the duration of the storage interval, and that the stability of BSTCA and 2-amino-TP was questionable.

Stability in Water ***MRID 46433901, Non-Guideline***
Study Classification - Acceptable

A storage stability study was conducted by fortifying control water from California with penoxsulam and the transformation products 5-OH (6-(2,2-difluoroethoxy)-N-(5,6-dihydro-8-methoxy-5-oxo-s-triazolo[1,5-c]pyrimidin-2-yl)-α,α,α-trifluoro-o-toluene sulfonamide); BSTCA (3-[6-(2,2-difluoroethoxy)- α,α,α-trifluoro-o-toluenesulfonamido]-s-triazole-5-carboxylic acid); BSA (2-(2,2-difluoroethoxy)-6-(trifluoromethyl)benzenesulfonic acid); XDE-638 sulfonamide (2-(2,2-difluoroethoxy)-6-(trifluoromethyl)-benzenesulfonamide); 2-amino-TP (2-amino-5,8-dimethoxy-s-triazolo[1,5-c]pyrimidine); TPSA (5,8-dimethoxy[1,2,4]triazolo[1,5-c]pyrimidin-2-yl)sulfamic acid); and 5-OH-2-amino-TP (2-amino-8-methoxy[1,2,4]triazolo[1,5-c]pyrimidin-5-ol), at 0.03 μg/mL, with subsequent analysis following 0, 130, 229, and 270-284 days of refrigerated storage (0, 130, 215, and 270 days for 5-OH-2-amino-TP).