UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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OFFICE OF PREVENTION,
PESTICIDES AND TOXIC
SUBSTANCES

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MEMORANDUM

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SUBJECT: **Propazine:** Comments on Griffin Corporation Response to EPA's Grassely-Allen Notification, Dated September 27, 1995

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SUMMARY

The registrant, Griffin Corporation, contends that propazine, a chloro-s-triazine, should not be subject to a special review or be included in the ongoing triazine special review. One of the bases for the registrant's contentions is that the environmental fate characteristics of propazine "differ markedly" from the characteristics of the other triazines under the proposed use patterns. An EFGWB review of the supporting documents (dated September 27, 1995) found no comparison of the environmental fate characteristics of propazine to other similar triazines, particularly atrazine and simazine. Available data from acceptable and supplementary data submitted to EPA and from published scientific literature suggest that the persistence, degradation mechanisms, and mobility of propazine is similar to that of atrazine and simazine. On this basis, **EFGWB recommends that propazine be addressed in the same manner as atrazine and simazine, with the same use restrictions and precautions.**

In their arguments, the registrant indicates their intention to use propazine on grain sorghum. The environmental fate database on propazine is not complete. To date, the registrant has only submitted studies in support of non-food greenhouse uses and not on terrestrial food and feed crop uses. EFGWB believes that decisions on the use of propazine for sorghum (a terrestrial food and feed crop use) be based on a complete environmental fate database. **The registrant has not provided a complete data package necessary to evaluate the intended use of propazine on sorghum; the existing environmental fate database is incomplete and a definitive assessment is not possible.**

ENVIRONMENTAL FATE CHARACTERISTICS OF PROPAZINE AND OTHER TRIAZINES

EFGWB noted in its Section 18 Emergency Exemption response (December 4, 1995; written before EFGWB received the registrant's response package) that available environmental fate studies submitted to EPA and published scientific literature indicate that the known environmental fate characteristics of propazine are similar to that of atrazine and simazine, two closely-related chloro-s-triazines. At the time, EFGWB recommended that propazine "be addressed in the same manner as atrazine and simazine, with the same use restrictions and precautions."

The registrant bases the contention that propazine has a lower potential for leaching and runoff entirely on proposed site and use characteristics and not on differences in the environmental fate characteristics of propazine and the other triazine chemicals. As noted in the attached EFGWB Section 18 Memo (see the section "Comparison to Other Chloro-s-Triazines"), available information, including published scientific studies, suggest that propazine is similar to atrazine and simazine in terms of degradation mechanisms, persistence and mobility (EFGWB One-Liner Database; Khan, 1980; Montgomery, 1993; Wolfe et al, 1990). Table 1 shows the comparison of the mobility of propazine, atrazine, and simazine in the same soils.

While numerous data gaps exist in the environmental fate database, available studies show that propazine is moderately to highly persistent (degrading by aerobic metabolism with an apparent half-life of 12 to 24 weeks) and mobile to very mobile in the soil environment. Like atrazine and simazine, propazine does not bind strongly to soils and therefore has the potential to leach to ground water or be transported by runoff to surface waters. Supplemental terrestrial field dissipation studies (which were not adequate to determine a DT_{50} value for propazine) found common degradates between propazine, simazine, and atrazine.

This comparison indicates that propazine would be expected to behave similarly to atrazine and simazine under the same environmental conditions. Therefore, propazine should be addressed in the same manner as atrazine and simazine, with the same use restrictions and precautions.

PROPOSED USES OF PROPAZINE AND THE STATUS OF THE ENVIRONMENTAL FATE DATABASE

The registrant clearly states their intention to use propazine on grain sorghum. To date, Griffin has submitted data only in support of non-food greenhouse uses for propazine. The environmental fate database on propazine is not complete and key studies necessary for a fate assessment for terrestrial feed and food crop uses are still missing. While existing studies suggest that propazine has the potential to leach to ground water or reach surface waters by runoff, additional studies are needed to better quantify this potential. As noted in the 10/27/95 EFGWB new chemical review of propazine for non-food greenhouse uses, additional environmental fate data would be necessary to fill the data gaps in support of outdoor usage. Data is still needed on photodegradation in water (Guideline Number 161-2) and on soil (161-3), terrestrial soil dissipation (164-1), and bioaccumulation in fish (165-4). Other studies, such as ground water monitoring studies, may also be needed. The results of all submitted studies must be cohesive and consistent so that a fundamental understanding of the environmental fate of the chemical and its metabolites/degradates is possible.

Decisions on the use of propazine on sorghum should be based on a complete environmental fate database. Since the registrant has not provided a complete data package necessary to evaluate the intended use, a definitive assessment is not possible.

REFERENCES

Burkhard, N., and J.A. Guth. 1981. Chemical hydrolysis of 2-chloro-4,6-bis(alkyl-amino)-1,3,5-triazine herbicides and their breakdown under the influence of adsorption. Pestic. Sci. 12:45-52.

Harris, C.I. 1966. Adsorption, movement, and phytotoxicity of monuron and s-triazine herbicides in soils. Weeds 14:6-10.

Khan, Shahamat U. 1980. Pesticides in the soil environment. Elsevier Scientific Publishing Company, Amsterdam. p. 90-97.

Montgomery, J.H. 1993. Agrochemicals desk reference: environmental data. Lewis Publishers, Chelsea, MI. p. 356-358.

Talbert, R.E., and O.H. Fletchall. 1965. The adsorption of some s-triazines in soils. Weeds 13:46-52.

U.S. Environmental Protection Agency. 1992. Pesticides in ground water database. A compilation of monitoring studies: 1971-1991. National summary. EPA 734-12-92-001.

Walker, A., and D.V. Crawford. 1970. Diffusion coefficients for two triazine herbicides in six soils. Weed Res. 10:126-132.

Wolfe, N.L., U. Mingelgrin, and G.C. Miller. 1990. Abiotic transformations in water, sediments, and soil. p. 103-168 *In* H.H. Cheng (ed.) Pesticides in the soil environment: processes, impacts, and modeling. SSSA Book Series No. 2. Soil Science Society of America, Madison, WI.

ATTACHMENTS

(1) Table 1: Published Soil Adsorption Data Providing for Direct Comparisons of the Mobility of Propazine, Atrazine, and Simazine (from Montgomery, 1993).

(2) Memorandum, 12/4/95, from Nelson Thurman, EFGWB, on Section 18 Emergency Exemption Request by the Texas Department of Agriculture to Use Propazine to Control Weeds in Grain Sorghum

Table 1: Published Soil Adsorption Data Providing for Direct Comparisons of the Mobility of Propazine, Atrazine, and Simazine (from Montgomery, 1993).

Soil Series	Soil Properties pH	OC %	CEC meq/100g	Propazine K_d mL/g	Propazine K_{oc} mL/g	Atrazine K_d mL/g	Atrazine K_{oc} mL/g	Simazine K_d mL/g	Simazine K_{oc} mL/g
Bates sil	6.5	0.80	9.3	0.70	88	0.80	100	1.00	125
Baxter sicl	6.0	1.21	11.2	1.90	157	2.30	190	2.30	190
Chillum sil	4.6	2.54	7.6	4.60	181	4.00	157	3.30	130
Clarksville sil	5.7	0.80	5.7	2.10	263	1.70	212	1.40	175
Cumberland sil 6.4	0.69	6.5	0.70	101	1.40	203	1.20	174	
Eldon sil	5.9	1.73	12.9	1.80	104	2.50	144	2.90	167
Evouettes	6.1	2.09	-	1.15	55	1.98	95	1.78	81
Gerald sil	4.7	1.55	11.0	1.80	116	3.20	206	4.20	271
Grundy sicl	5.6	2.07	13.5	2.80	135	4.80	232	6.50	314
Hagerstown sicl 5.5	2.48	12.5	3.70	149	3.70	149	1.67	67	
Hickory Hill si	-	3.27	-	11.90	363	7.07	216	7.04	215
Knox sil	5.4	1.67	18.8	2.70	162	3.60	216	5.10	305
Lakeland sil	6.2	1.90	2.9	0.80	49	1.00	53	0.90	47
Lebanon sil	4.9	1.04	7.7	2.00	192	2.20	212	2.80	269
Lindley l	4.7	0.86	6.9	2.20	256	2.60	302	2.60	302
Lintonia ls	5.3	0.34	3.2	0.10	29	0.60	176	1.00	294
Marian sil	4.6	0.80	9.9	2.10	263	2.20	275	3.50	438
Marshall sicl	5.4	2.42	21.3	3.00	124	4.50	186	7.20	298
Menfro sil	5.3	1.38	9.1	1.80	130	1.70	123	2.50	181
Newtonia sil	5.2	0.92	8.8	1.40	152	1.80	196	3.00	326
Oswego sicl	6.4	1.67	21.0	1.90	114	2.70	162	3.90	234
Putnam sil	5.3	1.09	12.3	1.10	101	1.90	174	2.20	202
Salix l	6.3	1.21	17.9	1.90	157	2.30	190	3.50	289
Sarpy l	7.1	0.75	14.3	1.20	160	2.20	293	2.00	267
Sharkey c	5.0	1.44	28.2	3.00	208	3.10	215	7.00	486
Shelby l	4.3	2.07	20.1	2.80	135	3.20	154	5.10	246
Summit sic	4.8	2.82	35.1	3.40	121	5.60	198	7.90	280
Union sil	5.4	1.04	6.8	2.40	231	4.10	394	3.80	365
Vertroz	6.7	3.25	-	4.69	144	2.88	89	2.88	89
Wabash c	5.7	1.27	40.3	3.10	244	3.70	291	6.00	472
Waverley sil	6.4	1.15	12.8	2.00	174	3.00	261	3.10	270
Wehadkee sil	5.6	1.09	10.2	1.60	147	1.80	165	2.70	248
Mean				2.45	156	2.82	195	3.50	244

Sources Used by Montgomery (1993): Burkhard and Guth, 1981; Harris, 1966; Talbert and Fetchall, 1965; Walker and Crawford, 1970.