UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

SUBJECT: Comments On Prowl

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The following are our comments on Prowl, based on the environmental and other data available to us at the present time:

1. Prowl appears to be stable at pH 5, 7 and 9 (20-25C) in water. It degrades rapidly in the presence of sunlight. However, the water photolysis study was carried out in the presence of acetone. To fully evaluate the photodegradability of Prowl in water, it would be desirable to know the role of acetone as a photosensitizer in the degradation of Prowl.

2. Data on soil persistence indicate that Prowl and its metabolites may be very persistent. In the ^{14}C-Prowl study in a New Jersey sandy loam field, 42 percent of the parent compound remained unchanged after sixteen months of exposure in the environment. In another study, using Princeton sandy loam in a field and Princeton sandy loam, Delaware loamy sand and Wisconsin silt loam under greenhouse conditions, between 72.9 and 84.4 percent of the original application was still present after 180 days. Most of this was parent compound. Other studies indicated a soil half-life of 14 to 90 days. An explanation is needed for the discrepancies between the different studies.

3. The leaching studies indicate that Prowl may be especially susceptible to leaching in clay soils. In the Minnesota clay loam soil field experiments, Prowl was found in significant quantities in the 3 to 6-inch soil layer, although the residues appeared to decline with time. Similarly, in laboratory experiments, significant quantities of Prowl were found in the 5 to 10-inch layers of an agricultural sand and clay soil. In this experiment, the 5 to

10-inch layer of clay soil also contained appreciable residues of Prowl. Further experiments should be conducted to demonstrate that the above leaching characteristics will not cause contamination of ground water.

4. In view of the leaching experiments cited above, it would be highly desirable to determine the adsorption/desorption characteristics of Prowl to soils. Data on the strength and extent of soil adsorption would aid in explaining the leaching data.

5. The data submitted in the guppy study do not support the registrant's conclusion that guppies were able to metabolize 90% of the parent compound to polar metabolites. Furthermore, the study was poorly conceived and executed. No data are provided concerning the levels of parent material and metabolites present in the water prior to the introduction of the two guppies. No controls were run to determine what levels of Prowl and metabolites would have occurred in the absence of fish. No indication of light conditions during the experiment were given, although Prowl has been shown to undergo rather rapid photolysis. (It is also interesting to note that there is a mistake in the total water concentration value in Table II. The individual values total 0.568 ppm, not 0.605 ppm). In arriving at the 90% figure, the registrant makes the assumption that all of the metabolites occurring in the water were attributable to fish metabolism and subsequent excretion of the metabolites. Because of poor experimental design and because fish still retained 45.3 ppm of parent compound in their tissues, this is a totally unwarranted assumption.

6. Similarly, the data submitted in the catfish bioaccumulation study do not really support the registrant's conclusion that metabolism of Prowl by catfish is a major factor in the drop in residues observed after the first two weeks. No indication is given as to catfish exposure to Prowl per se in water during the period of rapid concentration and depletion of ^{14}C residues in the fillet. Detailed analyses of the water for Prowl and metabolites was conducted on the 33rd day of exposure, at which time total ^{14}C residues had dropped to a level of about 3 to 6 ppm (according to Bionomics' report). This is well below the peak level of about 16 ppm reported on the 14th day of exposure. The high residue value of 17.35 ppm reported by the registrant on the 28th day of exposure and the value of 6.02 ppm reported by Bionomics for the same period may not be significantly different statistically, but the former value could mean that residues have not dropped as precipitously as Bionomics' data indicated.

7. There is insufficient data to determine whether or not the green algae bloom which occurred three weeks after the start of the study was to any extent responsible for the decline in catfish residues. Bionomics reported that "chemical analyses of centrifuged and uncentrifuged water samples showed no significant difference in ^{14}C-residues...." However, no hard data or detailed methodology

were provided to support this statement. Furthermore, it is of interest that, although the bloom was reported to occur about one week after peak residues occurred in the catfish fillets, it coincided perfectly with the peak residues in the viscera. If the differential centrifugation was done periodically from the time the bloom began until it collapsed (or until the end of the study) and results showed that there was no difference between the water containing suspended algae and the supernatant following centrifugation, then they would provide circumstantial evidence that the algae were not taking up large quantities of the chemical and thus making it less available for uptake by the fish. However, the concentration of algae cells in the water could greatly affect the results because the amount of assimilated ^{14}C-activity in algae per se removed from solution by centrifugation was not determined, the registrant's conclusion that algae were adsorbing or otherwise removing significant amounts or Prowl from the water is unjustified.

8. The catfish bioaccumulation study provided data which indicated that, theoretically, about 82 percent of the radioactive material applied to the soil was still present after 30 days of aging. These residues appeared to remain virtually constant throughout the subsequent 42 days of catfish exposure. These data, considered with the soil residue and hydrolysis data, indicate that Prowl and its metabolites may be quite persistent in aquatic ecosystems. In addition, the relatively high fish toxicity (Bluegill, 96-hour LC_{50} = 0.199 ppm; Rainbow trout 96-hour LC_{50} = 0.189 ppm) indicate that chronic toxicity may be quite high. Therefore, we believe that additional studies to determine fate and persistence of Prowl and its metabolites in aquatic systems are needed. The necessity for chronic studies would depend on the results of these experiments, but there is a high likelihood that a chronic study would be necessary.

9. Acute toxicity data on the principle metabolites would be desirable.

MEETING 6/10/75. Rogoff, Tourkey, Akerman, R. Cook, Ney.

ENVIRONMENTAL SAFETY REVIEW FOR PROWL——

AKERMAN'S COMMENTS

GENERAL CONCERNS OF TOURKEY-NEY 6/10/75

BASED ON THE PERSISTENCE OF THIS PESTICIDE IN BOTH THE TERRESTRIAL AND AQUATIC ENVIRONMENTS AND THE PROPOSED USES ON MAJOR AGRICULTURAL CROPS, CHRONIC FISH STUDIES WILL BE REQUIRED. ALTHOUGH THE NEED FOR THESE STUDIES WILL NOT HOLD UP REGISTRATION, THEY ARE TO BE CONSIDERED AS A REGISTRATION REQUIREMENT AND A COMMITMENT ON YOUR PART TO CONDUCT SUCH STUDIES IS NEED IT APPEARS THAT THESE CHRONIC STUDIES SHOULD BE CONDUCTED WITH THE PARENT COMPOUND ONLY. SINCE THESE STUDIES REQUIRE 1 YEAR TO COMPLETE, WE SUGGEST TO RD THAT SUCH STUDIES BE MADE AVAILABLE WITHIN 2 YEARS.

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3