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

OFFICE OF
PREVENTION, PESTICIDES
AND TOXIC SUBSTANCES

MEMORANDUM

MAR 18 1997

TO: Philip Errico, PM # 25
Registration Division (7505C)

THROUGH: Betsy Behl, Branch Chief, EFGWB
Dan Rieder, Branch Chief, EEB

FROM: Laura Parsons, Agronomist, EFGWB
Dennis McLane, Wildlife Biologist, EEB
Michael Barrett, Chemist, EFGWB
Siroos Mostaghimi, Environmental Engineer, EFGWB

SUBJECT: **EFED's review of a new chemical registration of Lightning.**

EFED has concluded this portion of the assessment for the registration of a combination of 52.5% imazethapyr and 17.5% imazapyr which is to be sold under the trade name of Lightning. For a full discussion of the assessment with expanded conclusion sections and comparison with other herbicides, please see the Barrett/Mostaghimi memo 3/12/97, the Parsons memo 3/20/97 and the McLane memo 3/18/97.

Data gaps: EEB: Avian reproduction study for Bobwhite Quail and Mallard Duck for imazapyr. EFGWB: Prospective ground water monitoring studies for imazethapyr and imazapyr on at least three sites. These data are essential to a full risk assessment of Lightning.

Toxicity: These herbicides have shown primary toxicity to plants and are effective at very low application rates. At the recommended application rate of 0.014 lb imazapyr ai/A, imazapyr RQ values are greater than 1 for terrestrial and semi-aquatic endangered species plants. RQ values of 1.1 were calculated for vegetative vigor of semi-aquatic (non-endangered species) plants. There was no serious risk (indicated by RQ <1) for emergence of terrestrial plants, vegetative vigor of semi-aquatic/terrestrial plants. The calculated levels also do not appear to pose a risk to terrestrial and aquatic animals.

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Since imazethapyr has already been approved for use on corn, toxicity values were not calculated for this assessment of a new use.

Exposure: All imidazolinone class compounds including imazapyr and imazethapyr have similar environmental fate profiles. These compounds are all **persistent** and **very mobile**. These characteristics are indicative of potential water contamination problems for both compounds. Estimates of surface water concentrations calculated by GENEEC range up to 2.26 ppb for imazethapyr and 0.87 ppb for imazapyr. S. Mostaghimi performed two PRZM-EXAMS model for imazethapyr and calculated maximum surface water estimates of 0.43 ppb for a pond adjacent to a corn site in Mississippi and 0.29 ppb for a pond adjacent to a corn site in Iowa. M. Barrett performed a PRZM model to simulate imazethapyr and imazapyr leaching to ground water; estimates calculated by this method were 6-8 ppb for imazethapyr and 1-3 ppb for imazapyr in ground water.

The proposed label contains several precautions aimed at minimizing the effect of these compounds on non-target plants.

- There are significant plant-back intervals (up to 40 months) listed for rotational crops. The label contains the disclaimer that "various environmental and agronomic factors make it imposible to eliminate all risks associated with the use of this product and, therefore, rotational crop injury is always possible".

- The proposed label states that "Lightning herbicide may cause injury to desirable trees and plants, particularly beans, cotton, flowers, fruit trees, grapes, ornamentals, peas, potatoes, soybeans, sugar beets, sunflowers, tobacco, tomatoes, and other broadleaf plants when contacting their roots, stems or foliage."

- The spraying instructions are designed to minimize drift to adjacent areas.

These are effective herbicides at very low application rates; young, actively growing plants are more susceptible than older established plants. Since these compounds degrade very slowly with the major route of dissipation being the mobility with water across or through the soil, the contamination of water to be used as irrigation sources seems probable. Although the RQ's for non-endangered plant species indicate that risk to non-target plants is low, the increased acreage for this projected use on corn could result in extensive water contamination. The additional use coupled with the persistence of these compounds may result in concentrations in water which are high enough to cause damage when crops are irrigated with contaminated water.