

V. Aggregate Exposures

In examining aggregate exposure, FFDCA section 408 directs EPA to consider available information concerning exposures from the pesticide residue in food and all other non-occupational exposures, including drinking water from ground water or surface water and exposure through pesticide use in gardens, lawns, or buildings (residential and other indoor uses).

A. Dietary Exposure

1. *Dietary exposure from food and feed uses.* Tolerances have been established (40 CFR 180.508) for residues of imazamox, per se, in or on canola and the legume vegetable group; imazamox and its metabolite AC263284 in or on wheat (bran, germ, grain, forage, hay, shorts, and straw); and imazamox and its metabolites AC26284 and AC312622 in or on alfalfa (seed, forage and hay). Time-limited tolerances for section 18 emergency exemptions are established for dry bean and canola. Section 180.508, which lists the maximum permissible levels for imazamox, will be removed since this regulation eliminates the need to establish maximum permissible levels for residues of the pesticide.

i. *Acute exposure.* Acute dietary risk assessments are performed for a food-use pesticide if a toxicological study has indicated the possibility of an effect of concern occurring as a result of a one day or single exposure. EPA concluded that no acute toxicological endpoint was identified from the toxicological studies submitted for imazamox, including oral developmental toxicity studies in rats and rabbits. Therefore, an acute dietary risk assessment was not conducted.

ii. *Chronic exposure.* EPA concluded that a chronic dietary risk assessment is not needed since no toxicity was observed at doses exceeding the Limit-Dose (1,000 mg/kg/day and higher) in chronic and subchronic studies in mice, rats, and dogs. A dose of 1,000 mg/kg/day is equivalent to a human diet in which the pesticide comprises approximately 7 percent of dietary consumption.

iii. *Cancer.* Imazamox is classified as a "not likely human carcinogen" based on the lack of evidence of carcinogenicity in mice and rats. Therefore a cancer risk assessment was not performed.

2. *Drinking water exposure.* The Agency lacks sufficient monitoring exposure data to complete a comprehensive dietary exposure analysis and risk assessment for imazamox in drinking water. Because

the Agency does not have comprehensive monitoring data, drinking water concentration estimates are made by reliance on simulation or modeling taking into account data on the physical characteristics of imazamox.

The Agency uses the First Index Reservoir Screening Tool (FIRST) or the Pesticide Root Zone/Exposure Analysis Modeling System (PRZM/EXAMS), to produce estimates of pesticide concentrations in an index reservoir. The SCI-GROW model is used to predict pesticide concentrations in shallow groundwater. For a screening-level assessment for surface water EPA will use FIRST (a tier 1 model) before using PRZM/EXAMS (a tier 2 model). The FIRST model is a subset of the PRZM/EXAMS model that uses a specific high-end runoff scenario for pesticides. While both FIRST and PRZM/EXAMS incorporate an index reservoir environment, the PRZM/EXAMS model includes a percent crop area factor as an adjustment to account for the maximum percent crop coverage within a watershed or drainage basin.

None of these models include consideration of the impact processing (mixing, dilution, or treatment) of raw water for distribution as drinking water would likely have on the removal of pesticides from the source water. The primary use of these models by the Agency at this stage is to provide a coarse screen for sorting out pesticides for which it is highly unlikely that drinking water concentrations would ever exceed human health levels of concern.

Based on the FIRST and SCI-GROW models the estimated environmental concentrations (EECs) for imazamox for acute exposures are estimated to be 5.7 parts per billion (ppb) for surface water and 1.0 ppb for ground water. The EECs for chronic exposures are estimated to be 0.61 ppb for surface water and 1.0 ppb for ground water.

B. Other Non-Occupational Exposure

The term "residential exposure" is used in this document to refer to non-occupational, non-dietary exposure (e.g., for lawn and garden pest control, indoor pest control, termiticides, and flea and tick control on pets). Imazamox is not registered or proposed for use on any sites that would result in residential exposure.

VI. Cumulative Effects

Section 408(b)(2)(D)(v) of the FFDCA requires that, when considering whether to establish, modify, or revoke a tolerance, the Agency consider "available information" concerning the

cumulative effects of a particular pesticide's residues and "other substances that have a common mechanism of toxicity."

EPA does not have, at this time, available data to determine whether imazamox has a common mechanism of toxicity with other substances or how to include this pesticide in a cumulative risk assessment. Unlike other pesticides for which EPA has followed a cumulative risk approach based on a common mechanism of toxicity, imazamox does not appear to produce a toxic metabolite produced by other substances. For the purposes of this tolerance action, therefore, EPA has not assumed that imazamox has a common mechanism of toxicity with other substances. For information regarding EPA's efforts to determine which chemicals have a common mechanism of toxicity and to evaluate the cumulative effects of such chemicals, see the final rule for Bifenthrin Pesticide Tolerances (62 FR 62961, November 26, 1997) (FRL-5754-7).

VII. Determination of Safety for U.S. Population, Infants and Children

1. *U.S. Population.* The toxicological profile for imazamox supports a tolerance exemption since no adverse effects were observed in the submitted toxicological studies regardless of the route of exposure. EPA does not expect imazamox to pose a dietary risk under reasonable foreseeable circumstances and, thus, EPA concludes that there is a reasonable certainty of no harm from aggregate exposure to imazamox residues. Accordingly, EPA finds that exempting imazamox from the requirement of a tolerance will be safe.

2. *Infants and children.* Section 408 of the FFDCA provides that EPA shall apply an additional tenfold margin of safety for infants and children in the case of threshold effects to account for prenatal and postnatal toxicity and the completeness of the data base on toxicity and exposure unless EPA determines that a different margin of safety will be safe for infants and children. Margins of safety are incorporated into EPA risk assessments either directly through use of a MOE analysis or through using uncertainty (safety) factors in calculating a dose level that poses no appreciable risk to humans.

EPA concludes there is a complete toxicity data base for imazamox and there is no evidence of pre-natal or post-natal toxicity to rat or rabbit fetuses following in utero exposure in the developmental studies or to young rats in the reproduction study. Due to the lack of toxicity in the animal studies,