

TABLE 2.—SUMMARY OF TOXICOLOGICAL DOSE AND ENDPOINTS FOR CYROMAZINE FOR USE IN HUMAN RISK ASSESSMENT—Continued

Exposure Scenario	Dose Used in Risk Assessment, UF	Special FQPA SF and Level of Concern for Risk Assessment	Study and Toxicological Effects
Long-Term Inhalation (> 6 months)	Inhalation (or oral) study NOAEL = 7.5 mg/kg/day (inhalation absorption rate = 100%)	Occupational LOC for MOE = 100 Residential LOC for MOE = 100	Chronic Oral Toxicity in Dogs. LOAEL = 75 mg/kg/day based on alterations in hematological parameters [hematocrit and hemoglobin (males)], decreased body weight/body weight gain and increases in several organ weights.
Cancer (oral, dermal, inhalation)	NA	NA	Group E carcinogen - evidence of non-carcinogenicity for humans.

### C. Exposure Assessment

1. *Dietary exposure from food and feed uses.* Tolerances have been established (40 CFR 180.414) for the residues of cyromazine, in or on the following raw agricultural commodities: dry bean, except cowpea, cabbage, chinese; mustard greens, mango, potato, leafy vegetables (except Brassica) group, cucurbit vegetables group, tomato, onions, mushroom, lima beans and pepper. Cyromazine tolerances are established for milk and tissues of cattle, goat, hog, horse, and sheep as a result of feeding cyromazine treated feed items. Rotational crop tolerances are established for sweet corn, radishes, and cotton. Additionally, cyromazine is registered for use as a feed through treatment for poultry for the control of flies and maggots in poultry manure. As a result of the feed-through use, tolerances are established for residues of cyromazine in egg and poultry tissues. Risk assessments were conducted by EPA to assess dietary exposures from cyromazine in food as follows:

i. *Acute exposure.* Quantitative 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. For this assessment, an appropriate endpoint attributable to a single dose (exposure) of cyromazine was not observed in oral toxicity studies.

ii. *Chronic exposure.* In conducting this acute dietary risk assessment EPA used the Dietary Exposure Evaluation Model software with the Food Commodity Intake Database (DEEM-FCID™) which incorporates food consumption data as reported by respondents in the USDA 1994–1996 and 1998 nationwide Continuing Surveys of Food Intake by Individuals (CSFII) and accumulated exposure to the chemical for each commodity. The following assumptions were made for the chronic exposure assessment: An

unrefined chronic exposure analysis (Tier 1) was conducted for cyromazine using the DEEM software. The assumptions of the chronic dietary exposure assessment are tolerance-level residues and one hundred percent crop-treated.

iii. *Cancer.* Cyromazine is classified as a Group E carcinogen (evidence of non-carcinogenicity for humans), and was shown not to be carcinogenic in mice or rats following long-term dietary administration. The available mutagenicity data suggest that cyromazine does not have genotoxic activity.

2. *Dietary exposure from drinking water.* The Agency lacks sufficient monitoring exposure data to complete a comprehensive dietary exposure analysis and risk assessment for cyromazine 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 cyromazine.

The Agency uses the FQPA Index Reservoir Screening Tool (FIRST) or the Pesticide Root Zone model/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. FIRST and PRZM/EXAMS incorporate an index reservoir environment, and 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 screen for sorting out pesticides for which it is unlikely that drinking water concentrations would exceed human health levels of concern.

Since the models used are considered to be screening tools in the risk assessment process, the Agency does not use estimated environmental concentrations (EECs) from these models to quantify drinking water exposure and risk as a %RfD or %PAD. Instead drinking water levels of comparison (DWLOCs) are calculated and used as a point of comparison against the model estimates of a pesticide's concentration in water. DWLOCs are theoretical upper limits on a pesticide's concentration in drinking water in light of total aggregate exposure to a pesticide in food, and from residential uses. Since DWLOCs address total aggregate exposure to cyromazine they are further discussed in the aggregate risk sections in Unit III.E.

In soil, cyromazine is stable to hydrolysis and photolysis and is rather persistent in aerobic soil (half-life value of 150 days). The field studies confirmed this half-life value, where average half-lives varied from 75 days to more than 250 days. Soil adsorption coefficients are generally low. This would indicate that cyromazine has the potential to leach through soils, especially sand and silt loam soils.

The EECs for cyromazine reflect six applications of cyromazine at 0.125 lbs ai/A. For surface water, the annual average of 15.5 µg/L (or ppb) is based on use of the FIRST model. The groundwater EEC of 5.3 µg/L has been estimated by the SCI-GROW2 program. Both of these surface and groundwater values represent upper-bound conservative estimates for concentrations that might be found in