

### C. Exposure Assessment

1. *Dietary exposure from food and feed uses.* Tolerances have been established (40 CFR 180.532) for the residues of cyprodinil, in or on a variety of raw agricultural commodities: almond, hulls; almond nutmeats; apple, wet pomace; fruit, pome; fruit, stone; grape; and raisins. Time-limited tolerances are established (40 CFR 180.532 (a)(2)) for onion, dry bulb; onion, green; and strawberry (each set to expire December 31, 2003). A time-limited tolerance (40 CFR 180.532 (b)) on caneberries is also set to expire December 31, 2003. Risk assessments were conducted by EPA to assess dietary exposures from cyprodinil in food as follows:

i. *Acute 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 acute exposure assessments: An unrefined, Tier 1 acute dietary exposure assessment (using tolerance-level residues, DEEM (version 7.76) default processing factors and assuming 100% CT for all proposed commodities) was conducted for the females 13–49 years old population subgroup.

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 was made for the

chronic exposure assessment: An unrefined, Tier 1 chronic dietary exposure assessment (using tolerance-level residues, DEEM default processing factors, and assuming 100% CT for all proposed commodities) was conducted for the general U.S. population and various population subgroups.

iii. *Cancer.* A quantitative cancer aggregate-risk assessment was not performed because cyprodinil is not carcinogenic.

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

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 cyprodinil they are further discussed in the aggregate risk sections in Unit III.E.

Environmental fate data suggest that as cyprodinil dissipates from the environment, it forms the transformation product CGA 249287 and other metabolites under natural conditions. CGA 249287 was observed at <11% of the applied parent in aerobic soil metabolism studies. It was also one of the transformation products observed at <14% in the terrestrial field dissipation studies.

EPA concluded that CGA 249287 is a potential concern in drinking water. Therefore, EEC's of CGA 249287 (along with the parent) were also simulated. The maximum application rate and relevant environmental fate parameters for cyprodinil and its metabolite CGA 249287 were used in the two screening models PRZM/EXAMS and SCI-GROW for EEC's in surface water and groundwater, respectively. The outputs of the two screening models represent estimates of the concentrations that might be found in surface water and groundwater due to the use of cyprodinil on cabbage and strawberry.

TABLE 3.—SUMMARY OF EPA'S EEC'S IN SURFACE WATER AND GROUNDWATER TABLE

Chemical	Surface Water (µg/L)		Groundwater (µg/L)
	Acute	Non-Cancer Chronic	
Florida Cabbage			
Cyprodinil	23.9	6.63	0.04
CGA 249287	5.29	1.42	0.12
Total	29.2	8.1	0.16