

yet determined whether or not these compounds modulate androgens by a common mechanism of toxicity. In fact, there is evidence that iprodione does not share a common mechanism of toxicity as it disrupts the endocrine system by inhibiting androgen synthesis rather than competing for the androgen receptor as vinclozolin does. In addition, these three chemicals do not have any known metabolites/degradates in common with the possible exception of 3,5-DCA which is structurally and toxicologically different from the parent compounds and unlikely to be an androgen receptor antagonist.

EPA has, at this time, some data which suggests that vinclozolin and procymidone have a common mechanism of toxicity. An article published in *Toxicology & Industrial Health* (Vol. 15, ISS 1-2, 1999, pg. 80-93) which reports the findings by Dr. Earl Gray, National Health and Environmental Effects Research Laboratory, U.S. EPA, Research Triangle Park, NC, suggests that procymidone alters sexual differentiation in the male rat by acting as an androgen-receptor antagonist *in vivo* and *in vitro*. The Agency has yet to make a conclusion as to whether these data are sufficient to evaluate whether vinclozolin and procymidone have a common mechanism of toxicity.

Even if it is assumed that vinclozolin and procymidone share a common mechanism of toxicity, a finding of reasonable certainty of no harm for vinclozolin can be made because any cumulative risk resulting from adding procymidone residues in wine to vinclozolin exposure is unlikely to differ significantly from the risk of vinclozolin alone. This conclusion is based on a number of factors. The exposure assessment for vinclozolin estimates that vinclozolin exposure through wine grapes contributes < 2% of the total vinclozolin exposure. The percent of imported wine grapes that are treated with procymidone is similar to that of vinclozolin (estimated 10% of wine grapes treated with vinclozolin and 9.4% of wine grapes treated with procymidone), and therefore, the exposure pattern for these chemicals is similar. In addition, the exposure estimates conservatively assume that all wine bearing vinclozolin residues also contain procymidone residues. In all likelihood, wine grapes would be treated with either vinclozolin or procymidone but not both chemicals. Vinclozolin exposure and procymidone exposure through wine grapes would each add < 2% to the "cumulative exposure." As noted above, the acute food-only risk of vinclozolin is 83% of

the aPAD at the 99.8th percentile of exposure, and the acute ground water EEC of 0.53 ppb and the acute surface water EEC of 5.68 ppb are lower than the drinking water DWLOC which is 30 ppb at the 99.8th percentile of exposure. There is ultimately enough room in the risk cup to accommodate vinclozolin and procymidone risk, even, if in the future, EPA does determine that procymidone and vinclozolin share a common mechanism of toxicity.

2. *Carcinogenic exposure and risk.* Since 3,5-DCA is not a registered pesticide, there is no FIFRA toxicology data base for this compound. In previous risk assessments, EPA has used the Q^{1*} for p-chloroaniline (PCA) to assess the carcinogenicity (only toxicological endpoint identified for 3,5-DCA) for other structurally related chloroanilines. EPA's approach on chloroanilines is to consider chloroaniline metabolites to be toxicologically equivalent to PCA unless there is sufficient evidence that the metabolite is not carcinogenic. A Q^{1*} of 6.38×10^{-2} (mg/kg/day) has been calculated for p-chloroaniline based on the spleen sarcoma rate in male rats from a National Toxicology Program bioassay.

Exposure to 3,5-DCA was evaluated from the following sources: Residues of vinclozolin- and iprodione-derived 3,5-DCA in food and wine, residues of procymidone-derived 3,5-DCA in imported wine, and 3,5-DCA residues in water from domestic agricultural uses of iprodione and vinclozolin. There are no U.S. registrations for procymidone. Therefore, an evaluation of exposure to procymidone-derived 3,5-DCA in water is not appropriate.

3. *Food risk—i. From vinclozolin-derived 3,5-DCA residues.* Cancer risks were 2.6×10^{-7} for all crops, excluding strawberries and stone fruits. BASF notes that the last day for legal use of vinclozolin in either strawberries or stonefruit was January 2000. In effect neither commodity has been treated with vinclozolin since the 1999 use season. In addition, the last day for legal use of vinclozolin on onions and raspberries was December 15, 2001. As a result the theoretical cancer risk calculated is an overestimation and these risks do not exceed the Agency's LOC.

ii. *From iprodione-derived 3,5-DCA residues.* As stated in the July 1998 Iprodione RED fact sheet, the cancer risk associated with 3,5-DCA derived from iprodione was 6×10^{-9} . This risk does not exceed the Agency's LOC.

iii. *From procymidone-derived 3,5-DCA residues.* The cancer risk associated with 3,5-DCA in imported

wine produced from grapes treated with procymidone was estimated to be 3.7×10^{-7} . This risk does not exceed the Agency's LOC.

4. *Drinking water risk—i. From vinclozolin derived 3,5-DCA.* Since the use on onions has been eliminated, the carcinogenic DWLOC for 3,5-DCA (based on the commodities currently available for consumption) has been calculated to range from 0.46 ppb to 1.6 ppb. Using Tier II PRZM/EXAMS, the modeled EECs are 0.64 ppb for lettuce and 0.34 ppb for canola. The use site which represents the highest modeled exposure in drinking water is golf courses. Application to golf course turf is currently permitted on grass mowed at 1 inch or less. Using the Tier I generic expected environmental concentration (GENEEC) model, the Agency has calculated a chronic EEC of 0.29 ppb based on application to tees and greens and a chronic EEC of 2.33 ppb assuming application to tees, greens, and fairways. These EECs were the result of refinements to the GENEEC model. These refinements included the incorporation of an 87 percent crop area factor as well as the percentage of the golf course that actually receives pesticide treatment, bringing the resulting PCA factor down to 17%. It was assumed that tees and greens comprise 2.8% of the acreage of a golf course. When fairways are included, an additional 16.7% of the golf course is treated. The EEC of 2.33 ppb exceeds the DWLOC. In evaluating whether this EEC indicated a risk of concern EPA considered the following factors:

ii. *The drinking water assessment on turf is based on GENEEC, a screening-level Tier I model.* At present, PRZM-EXAMS, the Tier II model, does not have the appropriate parameters to accurately model turf runoff. Although GENEEC is not an ideal tool for use in drinking water risk assessments, it can provide high-end estimates of the concentrations that might be found in a confined pond of one hectare. Drinking water from surface water sources does not typically come from this type of scenario, but rather from bodies of water that are substantially larger than such ponds and from diverse watersheds. Unlike a confined pond, there is always some flow (in a river) or turn over (in a lake or reservoir) resulting in an overestimation of the persistence of the chemicals near the drinking water utility intakes. Although a PCA of 17% was used to refine the model, the Agency recognizes that there are still uncertainties in the accuracy of the model to represent drinking water concentrations.