Department of Pesticide Regulation

Winston H. Hickox
Secretary for Environmental Protection

Paul E. Helliker, Director
830 K Street • Sacramento, California 95814-3510 • www.cdpr.ca.gov

Gray Davis
Governor

M E M O R A N D U M

TO: Gary Sprock, Registration Specialist **HSM-99024**
Pesticide Registration Branch

FROM: Michael H. Dong, Staff Toxicologist
Worker Health and Safety Branch

DATE: May 19, 1999

SUBJECT: PRODUCT NAME: *Bird Shield® Repellent Concentrate*
ACTIVE INGREDIENT: *Methyl Anthranilate*
COMPANY NAME: *Bird Shield Repellent Corporation*
I.D. NUMBER: *175108 (1 of 2 memos)*
DOCUMENT NUMBER: *52037-032*
EPA REGISTRATION NUMBER: *66550-1*
STUDY/DOCUMENT TITLE*: Dislodgeable Foliar Residue*

The above dislodgeable foliar residue (DFR) study was submitted in support of the determination of insignificant exposure for workers reentering treated fields (and for those handling the methyl anthranilate (MA) product). According to the product label proposed by Bird Shield Repellent Corporation (BSRC), this MA concentrate is to be mixed with water (1:99) before it is to be applied to fruit (grapes, citrus, etc.) and turf using a commercial or backpack type sprayer, a hand-held hose, or a pressurized applicator. Preharvest interval (PHI) was proposed to be 6 to 8 days after last treatment.

Foliar Residues. A *re*calculation of the DFR data suggested that the MA initial depositions on cherry and grape foliage were 1.8 and 0.15 $\mu g/cm^2$, respectively, from a 1:99 water solution sprayed to runoff. The same recalculated dissipation curves (Figures 1 and 2) also indicated that the respective half-lives were 2.8 (on cherries) and 6.5 days (on grapes). On the basis of *per pound of active ingredient applied per acre*, the above initial deposition on cherries was found comparable to the mean value previously calculated from nearly two dozen DFR studies on over a dozen pesticides (Dong, 1993). These observations, along with the poor recovery results (32 to 67%) reported in the BSRC study, suggest that the initial deposition on *grapes* should have been much higher than the value (0.2 $\mu g/cm^2$) recalculated here. Figure 2 shows that the half-life of the residues on grapes, like those residues on cherries, could be as short as 2 or 3 days, if the last observation (i.e., that on day 6) were excluded from curve fitting. Under normal circumstances

foliar residues should not be twice as much when they were observed 48 hours later.

Exposure of Harvesters. According to the product label, the maximum usage of MA active ingredient (AI) on cherries and grapes is 6.18 lb AI/acre. The dermal transfer factors (TF) of 4,000 and 7,500 μg/hr per μg/cm^2 were previously used, respectively, for tree fruit and grape harvesters (Dong, 1999). Based on these defaults, the absorbed daily dose (ADD) would be **49 mg/person** [= (0.5 μg/cm^2 per lb/acre for PHI = 6 days) x (4,000 TF) x (8 hr) x (50% default dermal absorption) x (6.18 lb/acre)] for **cherry harvesters** wearing long pants and long sleeves without gloves. Similarly, the ADD would be **185 mg/person** [= (1.0 μg/cm^2 per lb/acre for PHI = 6 days) x (7,500 TF) x (8 hr) x (50% default dermal absorption) x (6.l8 lb/acre)] for **grape harvesters** wearing the same type of work clothing. In calculating the ADD for grape (and cherry) harvesters, the previously generalized average initial deposition of 2.0 μg/cm^2 per lb AI/acre (and hence 1.0 μg/cm^2 for PHI = 6 days) was used instead of the observed value of 0.2 μg/cm^2 (primarily for reasons of inconsistency and poor recovery as stated earlier).

Exposure of Handlers. One reason for the much lower foliar residues found on grapes may be that in the study the grape applicators used a Solo gasoline powered backpack sprayer, instead of a PTO power-blast tower sprayer as used by the cherry applicators. This type of backpack hand-gun sprayer is not designed for delivery of high volume or full coverage (uniformly broadcast) spray. Applicators are hence expected to use a PTO power-blast sprayer as well when treating a large vineyard with the repellent product. In previous pesticide exposure assessments (e.g., Dong, 1999), ground mixer/loaders were assumed to handle 100 acres per day under the presumption that they each might serve multiple applicators on the same day for a large operation. Based on this usage default and the surrogate (dermal) exposure rate from PHED (1995), the ADD would be **260 mg/person** [= (0.84 mg/lb AI) x (6.18 lb AI/acre) x (100 acres/day) x (50% default dermal absorption)] for ground (airblast) **mixer/loaders** wearing long pants, long sleeves, and chemical-resistant gloves. For **airblast applicators** wearing the same type of work clothing, the ADD would be **59 mg/person** due to the use of lower daily usage of 40 acres (Haskell, 1998) and of lower PHED exposure rate (0.48 mg/lb AI). (Note that daily dose from inhalation exposure was not considered here for handlers mainly because the inhalation exposure rates calculated from PHED

were ≤ 1% of the dermal rates. By day 6 post-application, airborne residues of MA or of most any chemical are also expected to be negligible.)

Natural Occurrence. The food residue data submitted earlier (Askham, 1997) suggested that the average total daily intake may be around **10 mg/person** for at least one sector of the general population. This total intake estimate was calculated from summing the average daily intake of 5.0 mg from food flavors (e.g., chewing gum, frozen dairy, puddings, etc.) for ages 2 years to 65+, the average daily intake of 3.5 mg per liter (4 cups) from grape juice, and the average daily intake of 0.5 mg per liter from wine. It is true that those individuals who had a liter of wine might not want to drink grape juice on the same day, and that the estimates as calculated for intakes from food flavors might have been inflated (Askham, 1997). However, neither did the above total intake estimate take into account other potential natural or nonoccupational sources such as pharmaceutical uses (e.g., cough medicine) and fruits other than grapes or natural foods. (We assume that after a day's work in the field as either handlers or harvesters, workers are not expected to have the time or desire to consume foods that are rich in MA.)

Recommendations. **Based on the above observations and considerations, it is concluded that *significant* (worker) exposure to methyl anthranilate could result from the anticipated use of the subject product**. Possible exposure mitigation measures proposed here include meeting *two* conditions as follows: (1) Limit the application rate to 3.0 lb (from the maximum label rate of 6.2 lb) AI per acre **and** (2a) for *cherry harvesters*, either wear gloves (plus long-sleeves) or extend the PHI to 9 days (from 6 days); (2b) for *grape harvesters*, wear gloves (plus long-sleeves) *and* extend the PHI according with new and more acceptable DFR data that would show a shorter half-life or would confirm the lower initial deposition; (2c) for *mixer/loaders*, wear coveralls over normal work clothes (plus gloves) *and* limit the daily usage to 40 acres or less; or (2d) for *airblast applicators*, wear coveralls over normal work clothes (plus gloves).

Alternatively, the registrant could demonstrate greater dietary exposure to raise the allowable worker exposure and conduct a dermal absorption study to lower the calculated absorbed dose. In any case, homeowner users, turf applicators, and grower operators are not required to follow any of the above mitigation measures since the amount of MA that they each handle is *far* less than 40 acres per day.

References

Askham LR, 1997. Methyl Anthranilate – Residue Data. Cal/EPA Department of Pesticide Regulation Registration Document No. 52037-029.

Dong MH, 1993. Human Pesticide Exposure Assessment – Imidacloprid. HS-1682. Worker Health and Safety Branch, Cal/EPA Department of Pesticide Regulation.

Dong MH, 1999. Human Pesticide Exposure Assessment – Naled. HS-1739. Worker Health and Safety Branch, Cal/EPA Department of Pesticide Regulation.

Haskell D, 1998. Canada-United States Trade Agreement (CUSTA) Working Group, Final Draft of Position Paper for Issue Eight: Typical Workdays for Various Crops. HSM98001. Worker Health and Safety Branch, Cal/EPA Department of Pesticide Regulation, dated June 19.

PHED (Pesticide Handlers Exposure Database), 1995. Prepared for Health Canada, U. S. EPA, and American Crop Protection Association by Versar Inc. (6850 Versar Center, P.O. Box 1549, Springfield, VA 22151), Version 1.1.

Figure 1. Dissipation of Methyl Anthranilate on Cherry Foliage, from a 1:99 Water Solution Sprayed to Runoff

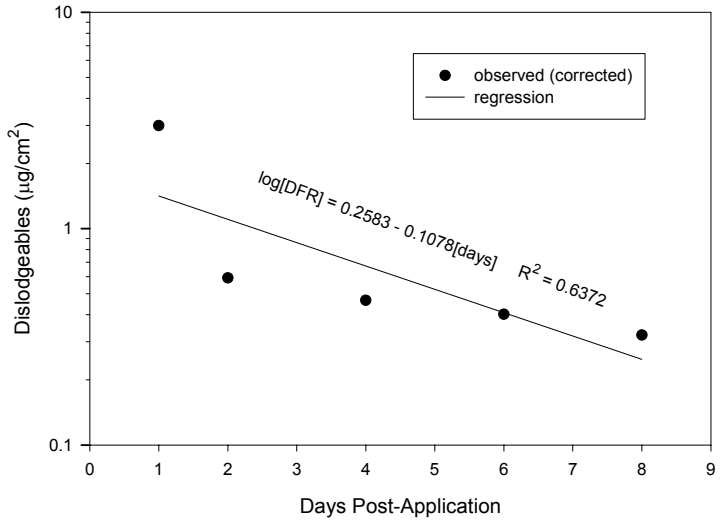
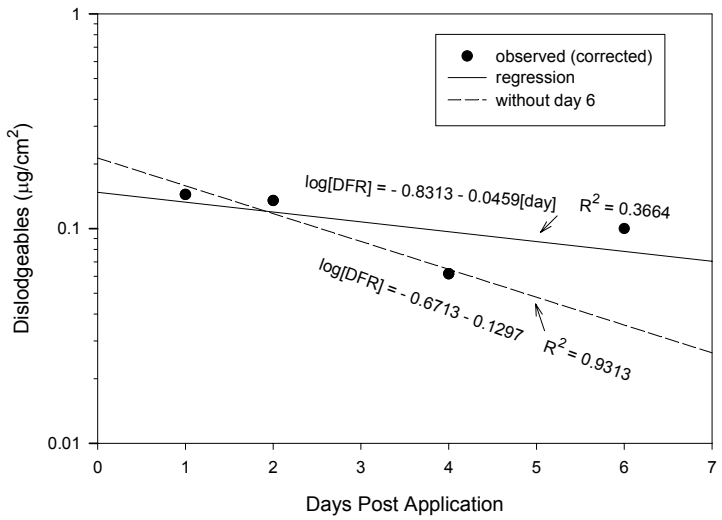


Figure 2. Dissipation of Methyl Anthranilate on Grape Foliage, from a 1:99 Water Solution Sprayed to Runoff



cc: John H. Ross