Impacts of the Food Quality Protection Act of 1996 on Future Pesticide Use— Does Anyone Have a Crystal Ball?

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With a brisk pen stroke on August 3, 1996, President Clinton replaced a regulatory dinosaur with what has been called by some a "Trojan Ice-berg" by signing into law the Food Quality and Protection Act of 1996 (FQPA). The FQPA elimina-ted the Delaney Clause as it applied to pesticide residues in food and set in place a complex set of new requirements that the U.S. Environmental Protection Agency (EPA) must fulfill as it makes decisions concerning the appropriate-ness of new and existing tolerances for pesticide residues on foods. It should be noted that the Delaney Clause still continues to apply in the regulation of food additives, but pesticide residues are no longer consid-ered as food additives.

Some major highlights of the bill include:

- A single standard for pesticide residues, repre-senting a "reasonable certainty of no harm," is established for both raw and processed foods. This replaces the Delaney Clause, which did not allow any residues of potentially carcinogenic pesticides on processed food forms if residues concentrated from their levels in raw commodities during processing.
- Aggregate exposure from individual pesticides must be taken into account, including exposures from food, drinking water, and domestic use (but not worker exposure).
- Cumulative exposure to pesticides possessing com-mon methods of toxicological action (organo-phosphates, carbamates, etc.) must be considered rather than simply the exposure to individual mem-bers of the family. For example, diazinon is a

member of the organophosphate insecticide fam-ily; cumulative exposure to all members of the family, including diazinon, must meet the "reason-able certainty of no harm" criteria rather than just diazinon by itself.

- In determining a "reasonable certainty of no harm," EPA is required to determine that toler-ances are safe for children, taking into account the special sensitivity and different exposure levels of children to pesticides. In some cases, EPA may use up to an additional 10-fold uncertainty factor when determining acceptable levels of exposure for infants and children.
- EPA must publish a pamphlet, to be distributed annually to large retail grocers for public display, describing risks and benefits of pesticides, recommending ways to reduce exposure to pesti-cides while maintaining a healthy diet, and listing any decisions where pesticide benefits were considered in approving specific tolerances that didn't meet the "reasonable certainty of no harm" standard.
- EPA is directed to establish and implement a screening program for pesticides considered as endocrine disruptors.

Scientifically, FQPA represents a considerable improvement over the Delaney Clause. The rigidity of Delaney and the statutory inconsistencies between the Federal Food, Drug, and Cosmetic Act and the Federal Insecticide, Fungicide, and Rodenticide Act were eliminated, and EPA scientists are given the flexibility (in theory) to develop risk assessments using the best available and reliable data.

At the present time, however, the method of implementation of FQPA by EPA remains highly uncertain. The major issue centers upon the size of the "risk cup" which will consider both aggregate (dietary, drinking water, and domestic) and cumulative ("fami-lies" of pesticides) exposure. In the case of the organo-phosphate insecticides, for example, the total estimated exposure to all organophosphates from aggregate sources must not cause the risk cup to "overflow." In the event that the total cumulative exposure is greater than that allowed in the risk cup, specific regulatory decisions may be made to "top off" the risk cup by reducing the exposures to acceptable levels.

Of critical importance in the risk assessment process is the extent to which EPA will use real world data on pesticide use and pesticide residue levels. Traditionally, the EPA has initiated its exposure assessments by determining the maximum "legal" levels of residues by assuming 1) the pesticide is always used on all commodities for which it is registered, 2) residues are always present at the maximum (tolerance) levels, and 3) there is no reduction in residue levels from the time of harvest to the time of consumption.

This approach typically results in exposure estimates hundreds to tens of thousands of times exaggerated when compared to those derived from actual monitoring data. (Archibald and Winter, 1989; Winter 1992) The FQPA allows EPA scientists to consider realistic data when available, but it is likely that EPA may resort to making more conservative assumptions of exposure due to limitations in the available pesticide use and pesticide-residue databases.

So what's going to happen?

It is likely that at least some existing pesticide toler-ances will be revoked, particularly for pesticides of "families" with common mechanisms of toxic action. The extent by which the risk cups overflow is largely going to be determined by subjective judgments of EPA scientists in making assumptions of pesticide expo-sures. If EPA scientists use reasonably conservative assumptions, expect significant "flooding" from the risk cups, resulting in widespread revocation of pesticide tolerances which may dramatically affect pest control practices, including integrated pest management. By how much will the risk cups overflow? Right now, it's too early to tell. Has anyone seen my crystal ball?

References:

Archibald, S.O. and C.K. Winter. 1989. Pesticide residues and cancer risks. *California Agriculture* 43(6): 6-9.

Winter, C.K. 1992. Dietary pesticide risk assessment. *Reviews of Environmental Contamination and Toxicology* 127: 23-67.