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Public Information and Records Integrity Division
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ESSENTIAL STEPS IN MITIGATING CHLORPYRIFOS RISKS:
CONSUMERS UNION COMMENTS TO EPA DOCKET OPP-34203C

These comments are submitted on behalf of Consumers Union of United States, Inc. (CU).[1] We applaud the steps announced June 8, 2000, to reduce exposures to and risk from chlorpyrifos in both agricultural and non-agricultural settings. We appreciate this opportunity, through the public participation process, to offer suggestions on further steps needed to assure that aggregate chlorpyrifos risks, as well as cumulative organophosphate/carbamate insecticide risks, meet the Food Quality Protection Act (FQPA)'s safety standard, "reasonable certainty of no harm."

Basis for Establishing Tolerance Reduction Goals

EPA needs a sound, data-driven basis for establishing interim or provisional tolerance reduction goals for major organophosphate (OP) insecticides prior to the completion of the OP cumulative risk assessment. Consumers Union has extensively analyzed the frequency, levels and relative risks associated with chlorpyrifos and other pesticide residues in both domestic and imported foods. Our analyses have drawn heavily on the results of the 1994-1998 Pesticide Data Program (PDP) carried out by the U.S. Department of Agriculture (USDA), the best source of accurate and realistic information on residues in major children's foods on an "as eaten" basis.

[1] Consumers Union is a nonprofit membership organization chartered in 1936 under the laws of the State of New York to provide consumers with information, education and counsel about goods, services, health, and personal finances and to initiate and cooperate with individual and group efforts to maintain and enhance the quality of life for consumers. Consumers Union's income is solely derived from the sale of *Consumer Reports*, its other publications and from noncommercial contributions, grants and fees. In addition to reports on Consumers Union's own product testing, *Consumer Reports* regularly carries articles on health, product safety, marketplace economics and legislative, judicial and regulatory actions that affect consumer welfare. Consumers Union's publications carry no advertising and receive no commercial support.

We developed a “Toxicity Index” (TI) to shed light on the relative significance of residues in different foods. A pesticide-food’s TI score is based on the percent of samples testing positive, the mean level of residues detected, and the pesticide’s inherent mammalian toxicity. (See our reports “Do You Know What You’re Eating?” at <http://www.ecologic-ipm.com/Do_You_Know.pdf> and “Update: Pesticides in Children’s Foods” at http://www.ecologic-ipm.com/PDP/Update_Childrens_Foods.pdf.)

Table 1 provides an overview of chlorpyrifos residues and relative dietary risk levels associated with the key children’s foods tested by PDP. The table includes 22 crops/foods. TI scores are reported for the most recent year of PDP testing for those crops that have been tested more than one year. The scores reflect residues in crops grown in the United States. Across the 22 foods, the sum of TI scores is 177.1.

EPA was correct in targeting apples, tomatoes, and grapes for significant reduction or elimination of residues; these three crops top the list in Table 1 and account for about 63 percent of total TI units across the 22 crops. Chlorpyrifos applications on apples will be restricted to the pre-bloom period and the tolerance will be lowered 150-fold, from 1.5 ppm to 0.01 ppm. The grape tolerance is also being lowered to 0.01 ppm and the tomato tolerance is being revoked.

These actions will markedly reduce chlorpyrifos dietary exposure and risks. According to EPA, just these three actions lower acute dietary risks for the most at-risk population group (children ages 1 to 6) at the 99.9th level of exposure from 355 percent of the acceptable level of exposure (the acute Population Adjusted Dose, or aPAD) to 82 percent of the aPAD. But in order to keep risks from rising on other crops, and ultimately to meet the organophosphate cumulative risk reduction goal, EPA must act aggressively, across all chlorpyrifos food uses, to drive residues far below most of today’s existing tolerances. Even occasional residues can contribute significantly to cumulative exposure, since it is likely that several OPs will retain registrations on most fruits and vegetables. Modest residues of two or three OPs in several of the foods and beverages an individual consumes during a day can add up to significant exposure and risk.

Chlorpyrifos is currently registered for use on nearly 70 fresh fruit and vegetable crops. Tolerances allow its presence in all processed foods. As a result of EPA actions already announced on methyl parathion, as well as other changes in OP registrations, many farmers will, in the next few years, reassess when and how chlorpyrifos and other OPs will be used. In many crops, risks could rise if an application of chlorpyrifos (or another higher-risk OP) is added to a pest management program in the place of another high-risk insecticide. For this reason, EPA must undercut risk-trading by applying use restrictions and reducing tolerances comprehensively and consistently across all uses of chlorpyrifos and other OPs on fresh fruits and vegetables.

How might EPA accomplish this goal? Table 2 lists all current chlorpyrifos tolerances, along with proposed changes in tolerances as announced in the June, 2000 decision documents. The table also reports “Reference Concentrations” (RfCs) based on both acute dietary exposure and chronic exposure.

A "Reference Concentration" of a pesticide is the level of residues in a specific serving of food that will deliver, from just that food alone, a full reference-dose-worth of the pesticide to a person of specific bodyweight. Other things equal, the bigger the serving of food, the smaller the bodyweight of the person, or the more toxic the pesticide, the lower the RfC.

There is a direct link between acute RfCs and tolerances covering fresh food forms – clearly, tolerances covering OP residues in fresh fruits and vegetables cannot be set higher than acute RfCs if acute dietary exposure and risk reduction goals are to be met. Residues above the acute RfC in a single food would result in an individual being over-exposed on that day, regardless of any other exposures to the pesticide or other pesticides that pose risks through a common mechanism of action.

Setting Reference Concentrations

In our past analytical work and comments to EPA, we have based our acute RfCs on a 100 gram serving – about a medium size apple – consumed by a 20 kilogram (44 pound) child. These assumptions overstate aRfC levels for pesticides found in fresh fruits and vegetables for two reasons. First, most of EPA's dietary risk assessments completed to date on high-risk OPs find that younger children – often one to two year olds weighing much less than 44 pounds – have the highest exposure per pound of bodyweight.

Our estimates of aRfCs are on the high side for a second reason. The serving size we use in calculating aRfCs is100 grams, or 5 grams per kilogram of bodyweight. This level of dietary exposure is typically well below the serving size per kilogram of bodyweight associated with the 99.9th percentile of exposure – the level the agency uses in defining acceptable acute dietary risks. For most fruits and vegetables like apples, pears, peaches, bananas and potatoes, a 5 gram per kilogram bodyweight serving falls between the 40th and 60th percentile of consumption across individual eating days.

For example, in the case of apples, there are 889 valid eating days in the 1994-1996 USDA food consumption serving for children ages 1 through 5. We analyzed these 889 apple-eating days in preparing our June 6, 1999, comments on the EPA's science policy paper "Choosing a Percentile of Acute Dietary Exposure as a Threshold for Regulatory Concern." (Our comments are accessible at http://www.ecologic-ipm.com/999_comment_paper.pdf.) EPA has proposed that the 99.9th level of exposure in terms of grams of pesticide per unit of bodyweight be chosen as the regulatory threshold – a position since supported by several advisory bodies and now incorporated in agency acute dietary risk assessment/risk mitigation decisions.

In the case of apples, a four-year old child fell at the 99.9th level of consumption across the 889 eating days and consumed 22.8 grams of apples per kilogram of bodyweight. At the 95th level of consumption, a child consumed 13.8 grams per kilogram of bodyweight. The mean level of consumption was 6.8 grams per kilogram of bodyweight. If this child weighed 20 kilograms, he or she would have consumed 138 grams of apple a day – about one large apple. So our choice of 100-gram servings consumed by children weighing 20 kilograms (5 grams per kilogram bodyweight) underestimates by a significant degree the extent to which tolerances will need to be reduced to assure 99.9 percent of children do not consume excessive residues from just a single fresh food.

Our aRfCs are based on typical assumptions, not worst-case nor even the 99^{th} level of consumption. EPA may choose a different method or set of assumptions in setting acute Reference Concentrations for fresh fruits and vegetables. Acute RfCs may need to be an order of magnitude lower than CU's to protect children at the 99.9^{th} level of consumption. But however the agency decides to do so, acute RfCs should be a key benchmark in setting interim tolerances for OPs in fresh foods.

In estimating Reference Concentrations applicable to day to day, average chronic dietary exposure over a lifetime (cRfCs), we also sought to reflect a typical level of consumption rather than worst-case scenarios. Based on our review of food consumption survey data, we determined that 30 grams is an appropriate level to use in setting cRfCs for fresh foods. As children grow older, their diets diversify and no single food accounts for as large a share of food consumption as is typical for one to three-year olds. It is common for favorite fruits and vegetables to be eaten three to five times per week, if not more, and for serving sizes to fall between 50 grams and 150 grams. A food eaten three times a week in an average serving size of 70 grams would result in an average daily consumption during the week of 30 grams per day. EPA may choose to set cRfCs differently. In setting interim tolerances, the agency will need to consider chronic RfCs in cases where a pesticide's chronic PAD (cPAD) is three or more times lower than its acute PAD.

Table 2 reports both aRfCs and cRfCs for chlorpyrifos on foods consumed in fresh form like fruits, nuts and vegetables, along with the relationship between these levels and current and proposed tolerances. The table does not include over three-dozen chlorpyrifos tolerances on various processed food forms, animal feeds and products, oils, and processing wastes fed to animals. We exclude these tolerances for three reasons –

- The Reference Concentration concept does not apply to these foods in most cases since people do not consume them directly (fruit juices are an important exception that EPA must assess relative to aRfCs).
- Both USDA PDP and FDA residue data show that the vast majority of chlorpyrifos dietary exposure stems from residues in the fresh form of foods.
- Reductions in the chlorpyrifos tolerances covering fresh foods will also bring about significant reductions in the already low levels occasionally found in processed foods and animal products.

The chlorpyrifos acute RfC of 0.1 mg/kg is calculated with the pesticide's latest aPAD, 0.0005 mg/kg. The aPAD is based on the chlorpyrifos acute dietary Reference Dose of 0.005 mg/kg along with an added 10-fold FQPA safety factor. The chronic Reference Concentration is based on average 30-gram servings consumed on a long-term basis. The cPAD is 0.00003 mg/kg/day and is derived from the chronic Reference Dose of 0.0003 mg/kg/day along with an added 10-fold FQPA safety factor.

Interim Tolerances Must be Set Below the aRfC

If all chlorpyrifos tolerances were set at the acute RfC of 0.1 ppm, many children could still be over-exposed since chlorpyrifos residues might appear at or near this level in multiple foods consumed during a given day. In addition, chlorpyrifos is just one of several OP residues routinely found in food. Hence, to adhere to the spirit and letter of the FQPA, EPA should not set interim chlorpyrifos tolerances at the full acute RfC because of its dozens of uses and documented exposures from many sources.

CU recommends that until the OP cumulative risk assessment is complete and appropriate risk reduction measures in place, EPA should set interim OP tolerances on fresh fruits and vegetables at no more than one-tenth of the applicable acute RfC. In the case of chlorpyrifos, this rule would lead to the setting of interim fresh food form tolerances at the 0.01ppm level.

It is worth noting that in its June 6, 2000, decision, the agency announced that it would lower the chlorpyrifos apple and grape tolerances to 0.01 ppm – precisely our target for interim tolerances. This is a major reason why Consumers Union enthusiastically praised EPA for its June 6, 2000, announcement of chlorpyrifos risk reduction actions. (For CU's press release on the June 6, 2000 decision, go to http://www.ecologic-ipm.com/CU_PR_6600.html.)

Table 2 lists a total of 50 chlorpyrifos tolerances on fresh fruit and vegetables. Several tolerances are proposed for crop groupings – "Citrus Fruits" and "Legume Vegetables" for example. Based on the number of additional fresh fruit and vegetable crops accounted for in chlorpyrifos crop grouping tolerances, tolerances are proposed covering about 70 uses of chlorpyrifos on different fruits and vegetables.

The need for tolerance reductions beyond apples, grapes and tomatoes is evident in Table 2. CU recommends that individual, interim chlorpyrifos tolerances be set no higher than one-tenth the acute RfC, or 0.01 ppm. Only four proposed fresh fruit and vegetable tolerances out of about 70 would meet this criterion – and these include apples and grapes, two of the crops that EPA targeted for significant tolerance reduction in its June 2000 decision. The asparagus tolerance would need to be reduced by the greatest margin – from 5 ppm to 0.01 ppm – a 500-fold reduction. Tolerances covering residues in kiwifruit and radishes would need to drop 200-fold. Several other fruit and vegetable tolerances would need to be reduced between 20- and 100-fold. About 15 crops would be subject to modest reductions between 5- and 10-fold.

Lower Tolerances are Readily Attainable

In many cases, reducing tolerances 50- to 100-fold, or even 500-fold will not require dramatic changes in how a pesticide is used and applied by U.S. growers. This is because actual residue levels found in domestically produced foods are usually 10-fold less than tolerances and are often 100-fold less, and sometimes much more. This often-sizable gap between tolerances and actual residue levels constitutes "slack" in the tolerance system.

Allowing tolerances to remain on the books at much higher levels than necessary sanctions farmers, here and abroad, to make excessive and/or careless applications of pesticides without running the risk of over-tolerance residues. It can place U.S. growers at a competitive disadvantage and expose U.S. consumers to higher residues than typically associated with U.S. grown foods. Indeed, EPA's June 2000 explanation of the dietary risk mitigation measures imposed on chlorpyrifos uses states that the grape tolerance is being lowered to 0.01 ppm largely to eliminate higher residues found in imported grapes. The agency also states that this tolerance will cover any residues that might appear given the way U.S. grape growers are now using this insecticide.

The amount of slack in the tolerance system is quite remarkable. The last column in Table 1 reports the maximum chlorpyrifos residue level found in a given crop in Pesticide Data Program testing. Except in the case of apples, the maximum residue found in foods is never more than 0.07 ppm – or seven times the suggested 0.01 ppm interim tolerance level. In addition, the mean residue level found in about half of the 22 foods in Table 1 would already meet the 0.01 ppm tolerance reduction goal. These data imply that relatively modest changes in pesticide use patterns would be needed to meet 0.01 ppm interim tolerances on a majority of farms producing these crops in the U.S.

The Food and Drug Administration (FDA)'s annual "Total Diet Study" provides further evidence that meeting the 0.01 ppm tolerance will not be difficult for most farmers. EPA's October 14, 1999, revised acute dietary risk assessment memorandum released as part of the decision documents includes a table reporting all chlorpyrifos residues found in 18 market basket surveys carried out by FDA between 1991 and 1997. Chlorpyrifos residues were found in 105 distinct foods. In 91 cases, the maximum residue found in a given food was under 0.01 ppm. In eight of the 14 cases where the maximum residue found was over 0.01 ppm, the mean residue found did not exceed 0.01 ppm. The six cases where the mean of positive residues was above 0.01 ppm included raw apples, grapes, green peppers, Brussels sprouts, a boiled turnip and oat cereal. Clearly these data confirm that for virtually all processed foods, and indeed most fresh fruits and vegetables, a 0.01 ppm tolerance can readily be met.

Crop Specific Strategies to Meet Risk Reduction Goals

A combination of changes in chlorpyrifos use patterns should be effective in keeping residues below 0.01 ppm for most current fresh food uses, as is clear from a review of the mean residue data in Table 1. In the few cases where the principle need for the insecticide entails late season application at a rate likely to result in residues above 0.01 ppm, the use should be phased out.

The majority of chlorpyrifos food uses, however, need not be canceled to meet dietary risk reduction goals. Field corn is by far the major use, accounting for some 5.5 million pounds of use according to EPA's quantitative use analysis. This single crop accounts for about one-quarter of total chlorpyrifos use in agricultural and urban settings. Cotton is the second greatest use by volume, contributing another 670,000 pounds applied. The two major uses – corn and cotton – rarely result in residues. For these uses, worker exposure and risk must, of course, be managed, as must drinking water exposures.

Based on the data we have reviewed, apples are the only major children's food crop where the registrant and growers must achieve a dramatic change in residue levels. For this crop, the steps already agreed to by EPA and the registrants to achieve the needed reduction in residues will impose few hardships on farmers. The major change is the extension of the pre-harvest interval (PHI) to 120 days. In most apple-producing areas, there are about four months between the emergence of blooms on trees and harvest. In circumstances where an OP like chlorpyrifos is only sprayed before fruit is even formed, there is little or no chance of detectable residues appearing at harvest.

Current chlorpyrifos labels allow applications to apples up to 28 days before harvest. In all likelihood, most higher residue apples in recent years have been from farms where growers have delayed their last chlorpyrifos application to close to this minimum number of days before harvest.

All tree fruits should have applications limited to pre-bloom period and tolerances reduced to 0.01 ppm level, as done in the case of apples and grapes. In cases where EPA has data showing that pre-bloom applications will still result in residues over 0.01 ppm, the agency should augment the extension of pre-harvest intervals with reductions in the allowed rate of application.

In vegetable crops, field residue trial data should be analyzed to determine the necessary combination of extensions in PHIs and reductions in use rates. In some cases, EPA, the registrant and growers may wish to reach agreement on a dual-use rate label, with a lower rate required later in the season and nearer to harvest. For example, a 1.0 pound use rate might be allowed from planting through the fourth week of growth, followed by a 0.5 pound maximum rate for an additional four weeks, as long as the minimum PHI is not less than 60 days.

Conclusion

No one knows for sure what combination of changes in pesticide use patterns will be necessary to reliably adhere to chlorpyrifos interim tolerances set at 0.01 ppm. The agency should provide registrants and growers some time to sort out the necessary changes, as long as all parties have agreed to do whatever it takes to comply with the 0.01 ppm interim tolerance. In addition, there will no doubt be some major, important regional differences in the way chlorpyrifos is used in producing a given crop.

We appreciate the opportunity to offer these suggestions and applaud EPA and the registrants for the decisive steps already taken. By imposing the sort of risk reduction measures

we have outlined, many agricultural uses of chlorpyrifos can be retained while essentially eliminating detectable residues from the food supply. Achieving this goal will be well worth the effort and should serve as the model as EPA finalizes actions on other OP insecticides.

Sincerely,

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Table 1. Chlorpyrifos Toxicity Index Shares by Crop-Food Combination Based on Domestic Samples Only and the Most Recent Year of Testing in the USDA's Pesticide Data Program, 1994-1998

Crop	Year	Toxicity Index Value	Percent Share of Total TI	Number of Samples	Percent Positive	Mean Residue Level (ppm)	Maximum Residue (ppm)
Apples	1996	87.1	49.2%	502	24.5%	0.027	0.23
Tomatoes	1998	13.3	7.5%	431	4.6%	0.022	0.069
Grapes	1996	10.6	6.0%	211	7.6%	0.011	0.059
Oranges	1996	10.5	5.9%	511	12.1%	0.007	0.028
Sweet Potatoes	1998	9.4	5.3%	355	9.6%	0.008	0.023
Wheat	1997	9.3	5.2%	623	6.4%	0.011	0.04
Soybean Grain	1998	7.3	4.1%	590	9.5%	0.006	0.022
Peaches	1996	5.8	3.3%	198	5.6%	0.008	0.018
Tomatoes	1996	4.8	2.7%	134	3.0%	0.013	0.021
Celery	1994	4.5	2.6%	172	2.3%	0.015	0.045
Spinach, Fresh	1997	3.3	1.8%	497	2.2%	0.011	0.026
Cantaloupe	1998	2.6	1.5%	379	2.4%	0.009	0.02
Broccoli	1994	2.1	1.2%	659	1.7%	0.010	0.025
Pears	1998	1.5	0.8%	613	0.7%	0.017	0.049
Winter Squash, Frozen	1997	1.3	0.7%	199	2.0%	0.005	0.005
Spinach, Canned	1998	0.9	0.5%	687	0.6%	0.012	0.014
Carrots	1996	0.8	0.5%	481	0.4%	0.015	0.023
Strawberries, Fresh	1998	0.7	0.4%	554	0.9%	0.006	0.007
Potatoes	1994	0.5	0.3%	688	0.1%	0.024	0.024
Winter Squash, Fresh	1998	0.3	0.1%	347	0.3%	0.007	0.007
Orange Juice	1998	0.2	0.1%	368	0.3%	0.007	0.007
Lettuce	1994	0.2	0.1%	688	0.1%	0.010	0.01
Total TI Units		**177.1**					

Table 2. Updated Chlorpyrifos Acute and Chronic Reference Concentrations (RfCs) for Fresh Fruits and Vegetables and Proposed Tolerance to RfC Ratios (REV = Revoked)								
Crop	**Acute PAD/RfD (mg/kg)**	**Acute RfC (mg/kg)**	**Chronic PAD/RfD (mg/kg)**	**Chronic RfC (mg/kg)**	**Current Tolerance (ppm)**	**Proposed Tolerance (ppm)**	**Proposed Tolerance to Acute RfC Ratio**	**Proposed Tolerance to Chronic RfC Ratio**
ASPARAGUS	0.0005	0.1	0.00003	0.02	5	5	50	250
KIWIFRUITS	0.0005	0.1	0.00003	0.02	2	2	20	100
RADISHES	0.0005	0.1	0.00003	0.02	2	2	20	100
BRASSICA LEAFY VEG.	0.0005	0.1	0.00003	0.02	1	1	10	50
BROCCOLI	0.0005	0.1	0.00003	0.02	1	1	10	50
BRUSSELS SPROUTS	0.0005	0.1	0.00003	0.02	1	1	10	50
CABBAGE	0.0005	0.1	0.00003	0.02	1	1	10	50
CABBAGE, CHINESE	0.0005	0.1	0.00003	0.02	1	1	10	50
CAULIFLOWER	0.0005	0.1	0.00003	0.02	1	1	10	50
CHERRIES	0.0005	0.1	0.00003	0.02	1	1	10	50
CITRUS FRUITS	0.0005	0.1	0.00003	0.02	1	1	10	50
CRANBERRIES	0.0005	0.1	0.00003	0.02	1	1	10	50
LETTUCE	0.0005	0.1	0.00003	0.02	None	1	10	50
PEPPERS	0.0005	0.1	0.00003	0.02	1	1	10	50
ONIONS, DRY BULB	0.0005	0.1	0.00003	0.02	0.5	0.5	5	25
RUTABAGAS	0.0005	0.1	0.00003	0.02	0.5	0.5	5	25
WHEAT, GRAIN	0.0005	0.1	0.00003	0.02	0.5	0.5	5	25
SOYBEANS	0.0005	0.1	0.00003	0.02	0.3	0.3	3	15
TURNIPS, GREENS	0.0005	0.1	0.00003	0.02	0.3	0.3	3	15
ALMONDS*	0.0005	0.1	0.00003	0.02	0.2	0.2	2	10
PEANUTS	0.0005	0.1	0.00003	0.02	0.2	0.2	2	10
STRAWBERRIES	0.0005	0.1	0.00003	0.02	0.2	0.2	2	10

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Crop	**Acute PAD/RfD (mg/kg)**	**Acute RfC (mg/kg)**	**Chronic PAD/RfD (mg/kg)**	**Chronic RfC (mg/kg)**	**Current Tolerance (ppm)**	**Proposed Tolerance (ppm)**	**Proposed Tolerance to Acute RfC Ratio**	**Proposed Tolerance to Chronic RfC Ratio**
TREE NUTS*	0.0005	0.1	0.00003	0.02	0.2	0.2	2	10
WALNUTS*	0.0005	0.1	0.00003	0.02	0.2	0.2	2	10
BANANAS	0.0005	0.1	0.00003	0.02	0.1	0.1	1.0	5
MUSHROOMS	0.0005	0.1	0.00003	0.02	0.1	0.1	1.0	5
PROCESSED FOOD	0.0005	0.1	0.00003	0.02	0.1	0.1	1.0	5
SUNFLOWER, SEEDS	0.0005	0.1	0.00003	0.02	0.1	0.1	1.0	5
BEANS, LIMA	0.0005	0.1	0.00003	0.02	0.05	0.05	0.5	2.5
BEANS, SNAP	0.0005	0.1	0.00003	0.02	0.05	0.05	0.5	2.5
CORN, FRESH (SWEET)	0.0005	0.1	0.00003	0.02	0.1	0.05	0.5	2.5
CUCUMBERS	0.0005	0.1	0.00003	0.02	0.05	0.05	0.5	2.5
LEGUME VEGETABLES	0.0005	0.1	0.00003	0.02	0.05	0.05	0.5	2.5
NECTARINES	0.0005	0.1	0.00003	0.02	0.01	0.05	0.5	2.5
PEACHES	0.0005	0.1	0.00003	0.02	0.01	0.05	0.5	2.5
PEARS	0.0005	0.1	0.00003	0.02	0.01	0.05	0.5	2.5
PLUMS	0.0005	0.1	0.00003	0.02	0.01	0.05	0.5	2.5
PUMPKINS	0.0005	0.1	0.00003	0.02	0.05	0.05	0.5	2.5
SWEET POTATOES	0.0005	0.1	0.00003	0.02	0.05	0.05	0.5	2.5
APPLES	0.0005	0.1	0.00003	0.02	1.5	0.01	0.1	0.5
GRAPES	0.0005	0.1	0.00003	0.02	0.5	0.01	0.1	0.5
BANANAS, PULP	0.0005	0.1	0.00003	0.02	0.01	0.01	0.1	0.5
FIGS	0.0005	0.1	0.00003	0.02	0.01	0.01	0.1	0.5
TOMATOES	0.0005	0.1	0.00003	0.02	1	REV		

Table 2. Updated Chlorpyrifos Acute and Chronic Reference Concentrations (RfCs) for Fresh Fruits and Vegetables and Proposed Tolerance to RfC Ratios (REV = Revoked)								
Crop	**Acute PAD/RfD (mg/kg)**	**Acute RfC (mg/kg)**	**Chronic PAD/RfD (mg/kg)**	**Chronic RfC (mg/kg)**	**Current Tolerance (ppm)**	**Proposed Tolerance (ppm)**	**Proposed Tolerance to Acute RfC Ratio**	**Proposed Tolerance to Chronic RfC Ratio**
BLUEBERRIES	0.0005	0.1	0.00003	0.02	2	REV		
CANEBERRIES	0.0005	0.1	0.00003	0.02	1	REV		
CHERIMOYA	0.0005	0.1	0.00003	0.02	0.05	REV		
DATES	0.0005	0.1	0.00003	0.02	0.5	REV		
FEIJOA (GUAVA)	0.0005	0.1	0.00003	0.02	0.5	REV		
LEEKS	0.0005	0.1	0.00003	0.02	0.5	REV		
SAPOTE, WHITE	0.0005	0.1	0.00003	0.02	0.05	REV		
* Tree nuts group tolerance is "To Be Determined;" values for this food group and individual nuts are current tolerance levels.								
Acute RfC based on average 100 gram serving; chronic RfC based on 30 gram serving.								