

# The Food Quality Protection Act and California Agriculture

by

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*The Food Quality Protection Act (FQPA) of 1996 was the most wide-reaching revision of federal pesticide law in twenty years. Many of the FQPA's impacts are yet to be felt by California farmers. In seeking to further protect consumers, the FQPA will pose new challenges for California agriculture. The changes that may occur maybe quite expensive, and perhaps counterproductive from the perspective of consumers' health. Ê*

The Food Quality Protection Act (FQPA) was unanimously passed by Congress in 1996 and hailed as a landmark piece of pesticide legislation. It amended the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), and the Federal Food, Drug, and Cosmetic Act (FFDCA), and focused on new ways to determine and mitigate the adverse health effects of pesticides. FQPA is different from past legislation; it is based on the understanding that pesticides can have cumulative effects on people, and that policy should be designed to protect the most vulnerable segments of the population. Recent research at UC Berkeley has investigated some of the impacts that FQPA's provisions—many of which have yet to be fully implemented—may have on California growers and consumers.

## FQPA's Main Provisions

The publication of the National Research Council report *Pesticides in the Diets of Infants and Children* showed that pesticide residues have disproportionate effects on children. Children eat and drink more as a percentage of their body weight than adults; they also consume fewer types of food. These dietary differences account for a large part of the exposure differences between adults and children. The committee also found that pesticides have qualitatively different impacts on children because children are growing at such a rapid pace. This concern for the differential impact pesticides have on children is reflected in regulatory changes required by the FQPA. For instance, the "10X" provision of the FQPA requires an extra ten-fold safety margin for pesticides that are shown to have harmful effects to children and women during pregnancy.

The FQPA has also resolved the "Delaney Paradox" created by the Delaney Clause of FFDCA. Prior to FQPA, the Delaney Clause prohibited the use of any carcinogenic pesticide that became more concentrated in processed foods than the tolerance for the fresh form. This was supposed to protect consumer health, yet it had the paradoxical effect of promoting

other non-carcinogenic pesticides that created other (possibly more serious) health risks for consumers. FQPA standardizes the tolerances for pesticide residues in all types of food, and looks at all types of health risks.

The federal Environmental Protection Agency (EPA) must now ensure that all tolerances are "safe," defined as "a reasonable certainty that no harm will result from aggregate exposure to the pesticide." Historically, pesticide exposure was regulated through single pathways, either through food, water or dermal exposure. Now the EPA must consider all pathways of pesticide exposure, including cumulative exposure to multiple pesticides through a common mechanism of toxicity. This means that even though pesticides may be sufficiently differentiated that they are used on different crops to control different pests, they can have similar health effects on people. The result is that in some instances, pesticide tolerances for seemingly different insecticides must be regulated together based on their cumulative effects.

## The Costs of Banning Organophosphates

When FQPA was first signed into law, 49 organophosphate (OP) pesticides were registered for use in pest control throughout the country, and accounted for approximately one third of all pesticide sales. OP insecticides are highly effective insect control agents because of their ability to depress the levels of cholinesterase enzymes in the blood and nervous system of insects. It has been suggested that while dietary exposure to a particular OP may be low, the cumulative effects of simultaneous exposure to multiple OP insecticides could cause some segments of the U.S. population to exceed acceptable daily allowances. Reducing the risk from these aggregate effects is specifically addressed in the FQPA and is one of the reasons the EPA has chosen OP pesticides for the first cumulative risk assessment.

Due to their popularity and widespread use, many in the agricultural community are worried about FQPA implementation resulting in increased

**Table 1. Price and Production Changes from Organophosphate Ban**

Crop	Percent Change in Price	Change in Production (tons)	
		California	Rest of U.S.
Alfalfa	0.93	-184,845	48,783
Almond	0.48	-1,356	n/a
Broccoli	16.0	-111,285	2,083
Carrots	>0.01	-5	-3
Cotton	1.69	-1,148	-19,214
Grapes	0.05	-999	-265
Lettuce, head	0.36	-12,778	-3,864
lettuce, leaf	0.46	-1,510	-148
Oranges	0.32	-40,517	-28,137
Peaches/ Nectarines	0.32	-1,561	-2,016
Strawberries	0.26	-508	-743
Tomatoes, fresh	0.03	-388	-223
Tomatoes, Processed	0.16	-10,849	114
Walnuts	0.58	-1,091	n/a

restrictions on OP pesticides. By the time EPA released the *Revised OP Cumulative Risk Assessment* in 2002, 14 pesticides had already been canceled or proposed for cancellation, and 28 others have had considerable risk mitigation measures taken. Risk mitigation may include:

- Limiting the amount, frequency, or timing of pesticide applications
- Changes in personal protective equipment requirements (for applicators)
- Ground/surface water safeguards
- Specific use cancellations
- Voluntary cancellations by the registrant

Economic theory suggests that these increased restrictions and cancellations from the eventual implementation of FQPA will result in a reduced supply of commodities currently relying on OP pesticides for pest control. This will result in higher prices for consumers and a lower quantity sold. In order to estimate the possible welfare effects on the state of California, UC Berkeley researchers have conducted a study on the effects of a total OP pesticide ban on 15 crops. The estimated price and quantity changes are presented in Table 1.

Results of the economic analysis suggest that the total loss to producers and consumers in California from banning all OP use will be approximately \$200 million. There is significant uncertainty, as the final level of OP restrictions are uncertain; this is only an order of magnitude estimate of the effects. However, these effects only represent about two percent of the total revenue generated by the 15 crops studied in California. While the overall effects seem small, they may be more intense in some segments than others. The researchers found that the degree of impact rests on the effectiveness of alternative pest control strategies producers have to choose from when faced with an OP ban. In some cases, OP pesticides have no close substitutes, and cancellation will have larger effects. For instance, the losses in broccoli, one of the crops most sensitive to an OP ban, are driven by the lack of an alternative insecticide to treat cabbage maggot.

### Prices and Nutrition

As illustrated above, it is generally true that removing a pesticide from the production process will result in an increase of the price of the treated commodity. If consumers respond to the increased prices by reducing consumption of the affected fruits and vegetables (and perhaps shifting consumption to less nutritious foods), they may suffer a loss of health benefits associated with the change in consumption. Scientific evidence suggests a protective effect of fruits and vegetables in prevention of cancer, coronary heart disease, ischemic stroke, hypertension, diabetes mellitus, diverticulosis, and other common diseases. The level of protection suggested by these studies is often quite dramatic. A recent review of several studies found that “the quarter of the population with the lowest dietary intake of fruits and vegetables compared to the quarter with the highest intake has roughly twice the cancer rate for most types of cancer.”

Negative health outcomes from a change in dietary behavior may offset direct health benefits of a pesticide ban such as reduced exposure to carcinogenic residues on produce. A recent study investigates the possible magnitude of such offsetting health effects. Using data on what over 18,000 people eat and previous findings on how people respond to changes in the price of fruits and vegetables, the authors simulated some of the health effects of a small increase in produce prices. Specifically, they examined the

effects of a one-percent increase in the price of broad categories of fruits and vegetables on coronary heart disease and ischemic stroke, two of the most common causes of death in the United States. The results are reported in Table 2.

For a one percent increase in the average price of all fruits and vegetables, the simulations indicate an increase of 6,903 cases of coronary heart disease and 3,022 ischemic strokes. In order to offset these 9,925 cases in a population of 253.9 million people, a pesticide action would have to prevent one in 25,580 cancers. This is almost four times as protective as the mean risk of pesticide uses that were banned between 1975 and 1989. Although these results can not be applied directly to most individual pesticide bans—which typically only affect the price of a few crops—the study shows that pesticide regulations that reduce relatively small risks at high cost may actually have a negative impact on overall consumer health. Furthermore, the research also suggests that low-income consumers may be the hardest hit by the negative health impacts of price-induced dietary changes.

## Conclusions

The Food Quality Protection Act is a wide-reaching law that will have a large impact on California agriculture in the coming years. While an increased awareness of the effects of agricultural chemicals on vulnerable groups—especially infants—is a welcome addition to the nation's pesticide laws, regulators need to take into account the potentially high costs of additional pesticide bans on both producers and consumers. These costs can be measured not just in dollars, but also in dietary changes that may have negative health consequences. In implementing the regulations required by the FQPA, EPA should keep in mind that this most recent overhaul of the pesticide laws specifically grants the agency discretion in setting standards when use of the pesticides prevents other risks to consumers or avoids “significant disruption in domestic production of an adequate, wholesome, and economical food supply.”

We are among those who, everything being equal, would prefer to consume fewer pesticide residues in our own diets. Yet too narrow of a regulatory focus that ignores economic responses and countervailing health risks is misguided, as the net effect of public

**Table 2. Cases of Heart Disease and Stroke Induced by 1% Increase in Price**

Disease	All Fruits	All Vegetables	All Fruits & Vegetables
Coronary Heart Disease	1,442	2,951	6,903
Ischemic Stroke	744	1,482	3,022
Total	2,186	4,433	9,925

Source: Cash, Sunding, and Zilberman. *Health Trade-offs in Pesticide Regulation*, 2002. Results reported are the simulation means from a series of Monte Carlo trials (n=100,000).

health would be negative. This point is especially salient when one considers that certain pesticide uses have been canceled by the EPA on the basis of consumer risks that were less than one in a million over a lifetime of exposure. Ultimately, other less costly interventions such as labeling requirements and food preparation education campaigns may prove to be more effective means of achieving consumer safety in regards to agricultural chemical use.

### For More Information the Authors Suggest:

- S. Cash, D. Sunding, and D. Zilberman, “Health Tradeoffs in Pesticide Regulation,” working paper, UC Berkeley Department of Agricultural and Resource Economics, October 2002.
- U.S. Environmental Protection Agency Web site, “Food Quality Protection Act of 1996” background materials (<http://www.epa.gov/opppsp1/fqpa/>).
- “Special Focus: Food Quality Protection Act (FQPA),” *Choices*, third quarter 2000: 18-32.

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