

CONTROL OF PESTICIDE RESIDUES IN FOOD PRODUCTS
A Review of the California Program of Pesticide Regulation

SUMMARY

The Commission on State Government Organization and Economy (the "Little Hoover Commission") decided to undertake a study of pesticide residues in food in response to several factors: (1) several Commission members were personally interested in and concerned about this issue; (2) through a study of toxic waste dumps completed early in 1984, the Commission had become aware of the potential dangers from letting toxic substances in our environment go undetected; and (3) the Commission received a request from members of the State Legislature that the Commission examine issues having to do with pesticide residues in food.

Recent news stories regarding pesticide and selenium contamination of the Kesterson Reservoir and Wildlife Refuge in Merced County illustrate the danger of failing to take corrective action early on in the development of toxic hazards. By this time, so much is at stake economically in maintaining existing patterns of land and water use in the area that responding to the toxic hazard problem will require extraordinary political will. The Commission wanted to find out whether pesticide residues in food products or pesticide contamination of drinking water may represent analogous situations.

Over the course of our study, we learned that great uncertainties in science as well as inadequate practical knowledge of how, when, where, and by whom pesticides are used prevent government regulators from making perfect regulatory decisions in all cases. We also learned, on the other hand, that to the extent scientific assumptions are correct and pesticide use is reported, the California program of pesticide regulation, compared with programs in other states, is in many ways exemplary. Nevertheless, our Commission believes that California can substantively improve the efficiency and effectiveness of its regulatory program by implementing the more than 40 recommendations we have outlined in this report.

In Chapter I of our report, we have provided an extensive background on the existing regulatory program in place to control the availability and use of pesticides and to take corrective action whenever pesticides are found to be leaving unpredicted residues in food and/or water. We encourage our readers to give Chapter II -- THE SIGNIFICANCE OF "UNCERTAINTY" IN PESTICIDE REGULATION -- a careful reading, because a thorough understanding of how uncertainty undermines the regulatory decision making process is a prerequisite to understanding the findings and recommendations in this report.

Controversy. The nature of controversy inherent in

pesticide regulation may be stated briefly as follows:

*Pesticides make it possible to grow more food for people, rather than pests, to consume. They also reduce bacterial damage to human health and termite damage, for example, to buildings. In this sense, pesticides are "good," even though by design all pesticides are toxic to biological organisms.

*Some pesticides leave toxic residues in food and water, sometimes at levels that cause adverse effects on human health and the environment. In this sense, pesticides are in some cases "bad."

*Because no foolproof methodology exists to distinguish between "good" and "bad" pesticides, the registration of each new product -- and some of the older ones as well -- becomes the subject of controversy.

The culprit in pesticide regulation, if there is one, is uncertainty. Uncertainty means no one can be absolutely sure that pesticide use decisions will prove to be safe. What is at issue, then, is how to make decisions when we cannot predict with certainty what the consequences of our decisions will be.

In controlling the availability and use of pesticides, regulators draw upon three resources in making decisions: (1) scientific knowledge -- knowing which substances, under which conditions, and in which concentrations pose a threat to human health or the environment; (2) practical knowledge -- records of which substances are in fact being applied, by whom, at which geographic locations, how often, and on which crops (or buildings); and (3) will to act -- overcoming the inertia inherent in regulatory processes when action is necessary to protect human health and the environment.

The Commission's having conducted this study should not be taken to imply that the uncertainties inherent specifically in pesticide use and regulation involve threats to human health or the environment of unique magnitude. Indeed, there is great uncertainty as to the possible effects on human health and the environment of countless natural and synthetic chemicals to which people are exposed in various combinations for prolonged periods, albeit usually in minute doses.

SUMMARY BY CHAPTER OF FINDINGS AND RECOMMENDATIONS

Chapter III: PESTICIDE REGULATION: THE ROLE OF CALIFORNIA'S LEAD AGENCY

Chapter III examines the Department of Food and Agriculture's regulation of pesticides as practiced by the Division

of Pest Management, Environmental Protection, and Worker Safety. The division's activities to meet its twin missions of preventing harm to human health and the environment while at the same time promoting agricultural productivity are outlined. Chapter III includes a discussion of California's program of regulation for "structural pest control," meaning pesticides used to kill pests that attack and destroy buildings, clothing, stored food, and manufactured goods.

The general theme of Chapter III is that CDFA needs to institute a clearly articulated discipline for priority-setting. This same finding and our recommendations for addressing the problems that emanate from it are repeated throughout the remainder of the report.

FINDINGS AND RECOMMENDATIONS

Finding #1: CDFA's Pest Management Division sets management priorities within each subdivision in order to comply with statutory requirements, but the division lacks an articulated, overall priority-setting discipline for identifying "pesticides of greatest concern."

Recommendation: We recommend that the Pest Management Division in CDFA appoint all subdivision managers to begin work on selecting criteria to identify the pesticides of greatest concern and to integrate the "priority pesticides" with priorities already established for activities in each of the discrete regulatory functions.

Finding #2: CDFA inherits the weaknesses in EPA's programs, despite having state-level statutory authority in some cases to compensate for EPA's deficiencies.

Recommendation: We recommend that CDFA ask the Pesticide Advisory Committee to establish a policy for determining when the department should not wait for EPA to act before taking and/or coordinating state level action to prevent or mitigate a problem that has been identified in California.

Finding #3: Funding for pesticide regulatory activities is often inadequate to enable CDFA to maintain a state-of-the-art regulatory capability. Furthermore, the General Fund is supporting more than half the budget for the pesticide regulatory program.

Recommendations: We recommend that:

A. The Legislature amend current law to specify that the contribution from the Agriculture Fund shall equal the General Fund contribution to the support of pesticide regulation. Adjustments in the pesticide mill tax and/or the annual pesticide registration fee to meet this standard should be

adopted in the annual Budget Act.

B. The Legislature request from the Franchise Tax Board by July 1, 1985 a report on the amounts collected in "voluntary contributions" from California taxpayers in response to lines 86 through 92 on Form 540. The purpose of this report is to enable the Legislature to consider adding a line to this section of the state tax return to give taxpayers an opportunity to increase spending for pesticide regulation.

Finding #4: CDFA's program of public information is inadequate to give the public access to non-technical information on hazards associated with pesticide use and/or how the regulatory program works at the point such information is most needed.

Recommendations: We recommend that:

A. The Legislature authorize the establishment within CDFA's Pest Management Division of an Office of the Pesticide Ombudsman. We further recommend that the Pesticide Ombudsman institute a toll-free "hotline" to enable the office to receive calls from anywhere in the state. We also recommend that the Legislature memorialize Congress and the Governor work with the Reagan Administration to require pesticide registrants to include EPA's pesticide hotline number on all pesticide labels.

B. CDFA solicit the assistance of health and environmental advocacy groups and affected pesticide manufacturers in the planning, development, and scheduling of a series of seminars to be made available to public groups, including schools, upon request. We further recommend that pesticide manufacturers support this effort financially, especially when problems caused by a particular pesticide product trigger the need for a program of targeted public information services.

Chapter IV: REGISTRATION

Registration represents the gatekeeper in the regulation of pesticides. Registration processes provide the opportunity to generate the toxicological, environmental, and use data required by government and industry to verify the efficacy of each pesticide in its intended use and the likely levels of pesticide residues that will be left on target crops.

Both the federal government, through the Environmental Protection Agency (EPA) and the State of California, through the California Department of Food and Agriculture (CDFA), maintain comprehensive pesticide registration programs. EPA currently has approximately 60,000 pesticides registered; CDFA has registered nearly 12,000 of those pesticides for use just in California.

FINDINGS AND RECOMMENDATIONS

Federal Program

Finding #1: Certain EPA data bases critical to state monitoring and enforcement activities are inadequate. As a result, EPA and CDFA may in some cases make inappropriate regulatory decisions which impair their ability to effectively fulfill all regulatory responsibilities. Three specific problems are as follows:

A. EPA's toxicological data base on certain pesticides registered before 1972 is inadequate for assessing risk.

B. EPA's residue and monitoring data base is inadequate to enable EPA to determine whether registered pesticides are "behaving" as the registrants predicted at the time of registration.

C. EPA has initiated new efforts to establish a program of data requirements, scientific analysis, and enforcement activities to prevent pesticide contamination of groundwater. Prevention is late, however, as contaminated wells are being discovered throughout the country, including in California.

Recommendation: We recommend that the Legislature memorialize Congress and the Governor work with the Reagan Administration to require EPA to:

A. Establish toxicological and environmental data-sharing networks with the states.

B. Establish a residue data-sharing network with the Food and Drug Administration (FDA) and the states.

C. Coordinate efforts with manufacturers to create models for predicting environmental effects of pesticide use, especially with respect to potential for groundwater contamination.

D. Sponsor research to develop clean-up procedures to mitigate the effects of pesticide-contaminated groundwater.

E. Sponsor research for developing safe alternatives to soil and grain fumigants which may pose unreasonable risks to health and environment.

Finding #2: CDFA's data bases are inadequate. They reflect not only the inherited weaknesses of EPA's data bases but certain state-level deficiencies as well. Specifically:

A. CDFA's inheriting of EPA's inadequate toxicological data bases exacerbates uncertainty in risk assessment at the state level.

B. CDFA relies on manually maintained data files to catalogue information on approximately 12,000 registered pesticides.

Recommendations: We recommend that:

A. CDFA automate its pesticide toxicological data files.

B. CDFA establish toxicological data-sharing networks between departments of California state government, EPA, and other states.

C. CDFA articulate its criteria for setting priorities in selecting pesticides for special review.

D. CDFA co-sponsor with pesticide manufacturers a series of seminars intended to identify cost-sharing alternatives to pay for health effects testing of "older" pesticides.

Finding# 3: For some pesticides used on foods, CDFA lacks the residue data necessary for estimating risk.

Recommendations: We recommend that:

A. CDFA require manufacturers of "older" pesticides to provide updated data used to predict residues. Updated residue detection procedures, where these do not now exist, must also be made available.

B. CDFA require registrants to provide state laboratories with coded samples containing residues of the pesticides to be registered.

Finding #4: In some cases, CDFA lacks adequate data to enable the department to predict the environmental effects -- in particular, the likelihood of drinking water contamination -- of either previously or newly registered pesticides.

Recommendations: We recommend that:

A. The Legislature specify in new legislation that no pesticide which is applied directly to water -- such as rice field herbicides -- shall be registered in California until the Department of Health Services has set an "action level" (an advisory trigger for enforcement action) for it.

B. CDFA require registrants of pesticides which are injected into the soil, or applied directly to the water, to provide evidence in the form of statistical models that the pesticides will not pose a threat to public health or the environment.

C. Local water districts and county agricultural commissioners assemble names and telephone numbers of area laboratories equipped to analyze water samples from private wells and able to interpret the significance of the detection of pesticide traces.

Chapter V: RESIDUE MONITORING AND ENFORCEMENT

California state law divides the responsibility for monitoring pesticide residues in foods between the Departments of Food and Agriculture and Health Services on the basis of whether the food is a raw agricultural product, a processed food, or a food destined for processing. Produce distributed in fresh fruit and vegetable markets is monitored by CDFA. A food product altered chemically or physically before distribution -- other than sorting or cleaning -- is a "processed food" and is assigned to DHS for monitoring.

The federal government also monitors pesticide residues in raw produce and processed foods through the Food and Drug Administration (FDA). FDA's authority encompasses foods imported from other countries -- such as produce from Mexico -- as well as domestically grown food products distributed across state lines.

In general, the Commission found that the design of CDFA's pesticide residue monitoring program fails to enable the department to predict the likelihood that certain pesticides of concern will leave residues. This is so because the program focuses on crops rather than pesticides. If traffic controllers want to detect speeders, they patrol highways where speeding is most likely to occur, rather than busy streets where speeding is a practical impossibility. By designing residue monitoring to be crop-oriented rather than pesticide-based, CDFA cannot make use of information on residue-leaving behavior to prevent higher than tolerance pesticide residues in food. In other words, using the idiom of our analogy, it isn't the crops that may be "speeding" -- it's the pesticides.

FINDINGS AND RECOMMENDATIONS

Finding #1: CDFA's residue monitoring program is not designed to identify public health problems efficiently.

Recommendation: We recommend that CDFA implement a pesticide-based monitoring program to supplement its crop-based surveillance (deterrence) program.

Finding #2: The state lacks certain information on pesticide use which is essential for development of a pesticide-based monitoring program.

Recommendation: We recommend that CDFA develop a list of pesticides for which all agricultural users must keep detailed records of use.

Finding #3: Coordination among the Pest Management Division's internal units is inadequate to support priority-setting to identify the pesticides of greatest concern.

Recommendation: We recommend that the Pest Management Division's unit managers establish internal communications procedures designed to facilitate priority-setting for identifying both the pesticides and the crops which should be most carefully scrutinized in the residue monitoring program.

Finding #4: Laboratory resources for analyzing food samples to detect pesticide residues are inefficiently administered and poorly coordinated with the information needs of scientists in the Pest Management Division.

Recommendations: We recommend that:

A. Administrative control over laboratory testing for pesticides be transferred to the Pest Management Division.

B. A scientific advisory panel, which should include a lay person and a UC Cooperative Extension pest management specialist, be established to assist CDFA in setting priorities for the monitoring of pesticides and the operation of monitoring and enforcement programs.

C. The Legislature appropriate and the Governor approve additional funding for CDFA's pesticide residue laboratories to enable them to acquire state-of-the-art technology for chemical analysis and more space in which to conduct testing for pesticide residues.

Finding #5: CDFA lacks detection methods for many pesticides in common use in California.

Recommendation: We recommend that as part of the re-registration program mandated by Chapter 669, Statutes of 1984 (SB 950), data gaps on residue detection procedures be identified and filled.

Finding #6: The state lacks a trigger for taking enforcement action upon finding residues from certain pesticides known to cause adverse health effects.

Recommendation: We recommend that DHS, in conjunction with CDFA, set a food tolerance (or an action level) for pesticides which, because of their toxic potency, their likeli-

hood of leaving residues in foods, and the current absence of food tolerance-settings for them, may pose a significant risk to public health.

Finding #7: The state lacks an effective program of residue monitoring for foods destined for processing and for processed foods. The existing division of monitoring responsibility between CDFA and DHS is not conducive to effective enforcement of residue tolerances for processed foods.

Recommendations: We recommend that:

A. The responsibility for monitoring residues in raw agricultural produce grown in California, whether destined for produce markets or processing plants, be vested in CDFA.

B. DHS, in conjunction with CDFA, FDA, and EPA:

1. Identify those pesticides most likely to leave residues in processed foods and the food items in which they are most likely to be found; and
2. Set aside a portion of its monitoring program to ascertain the safety of post-harvest applications on foods in storage, in restaurants, or other locations where pesticides may be used in or around foods.

Chapter VI: USE MONITORING AND ENFORCEMENT

Federal law permits states to regulate the sale or use of all registered pesticides or devices within the state, provided the regulations do not permit sales or uses prohibited by federal law. In California, the county agricultural commissioners are the primary enforcement officers in the pesticide use monitoring program.

FINDINGS AND RECOMMENDATIONS

Finding #1: CDFA has little knowledge of the rate of compliance with laws and regulations for growers and applicators.

Recommendation: We recommend that CDFA continue its efforts to develop a system for estimating compliance among growers and applicators.

Finding #2: CDFA conducts only sporadic monitoring of non-restricted pesticides and incomplete investigations of illegal residues in foods.

Recommendations: We recommend that:

A. CDFA create a new use category called "use by prescription" for non-restricted pesticides whose improper or even legal use could lead to health and/or environmental problems.

B. The Legislature require a joint investigation by CDFA and county agricultural commissioners to produce a report on every incidence of illegal residues in foods.

Finding #3: Current enforcement sanctions are cumbersome, ineffective, and inadequate.

Recommendation: We recommend that the Legislature amend existing law to parallel recent changes provided for in Chapter 766, Statutes of 1984 (AB 294), which gave county agricultural commissioners the authority to suspend licenses and/or impose fines immediately upon detecting a violation by a structural pest control operator.

Chapter VII: INERT INGREDIENTS

The term "inert" as used by the pesticide industry and government regulators is misleading. The dictionary definition of inert is: "exhibiting no chemical activity, totally unreactive, or exhibiting chemical activity under special conditions only." In contrast, "inert" in pesticide jargon refers to the substances added to the formulation for a purpose other than to kill the target pest (e.g., adhesives or emulsifiers).

Inert ingredients are virtually unregulated. They are not subject to routine residue monitoring nor formula verification testing to ensure correct labelling. Inerts are generally exempt from food tolerances. Roughly 1,000 to 1,200 chemicals are used as inert ingredients in pesticide formulations.

FINDINGS AND RECOMMENDATIONS

Finding #1: CDFA and DHS have inherited a serious data gap on the inert ingredients in pesticide formulations.

Recommendations: We recommend that:

A. The Legislature memorialize Congress and the Governor work with the Reagan Administration to require that formulators of pesticides provide justification as to why an inert ingredient should not be listed on the pesticide label. Inert ingredients that are identified as likely to pose a health hazard if the pesticide is misused should have their technical name (or names) included on the label.

B. The Legislature memorialize Congress and the Governor work with the Reagan Administration to change the designation of ingredients of pesticide formulations currently defined in federal law as "inert ingredients" to "non-pesticidal ingredients," or some other less misleading term.

C. CDFA integrate the regulation of inert ingredients into the re-registration program mandated by Chapter 669, Statutes of 1984 (SB 950).

Finding #2: There are no practicable analytical residue detection methods for many inerts.

Recommendation: We recommend that CDFA require pesticide registrants to provide analytical methods for detecting residues of inert ingredients identified as being hazardous pursuant to Section 2378 of Title 3 of the California Administrative Code.

Finding #3: The level of residues in foods which may pose a significant risk to human health has not been determined for the inert ingredients identified as being of health concern.

Recommendations: We recommend that DHS, in conjunction with CDFA:

A. Set tolerance levels for inert ingredients that (1) have been identified pursuant to Section 2378, (2) are known to leave residues in foods, and (3) may pose a significant health risk when not used in accordance with label instructions.

B. Be given responsibility for setting food tolerances for the small number of inert ingredients of concern.

Chapter VIII: MONITORING OF IMPORTED FOODS AND FOODS IN INTERSTATE COMMERCE

The Federal Food, Drug, and Cosmetics Act grants FDA the authority to collect and inspect -- for purposes of monitoring pesticide residues -- samples of foods imported from foreign countries, or grown domestically but shipped across state lines. Adulterated products may be seized or refused entry, or both. Within California, FDA lacks embargo authority, relying on EPA to be the prosecuting agency. In such a situation, EPA would notify the state to take appropriate enforcement action.

Nationwide, FDA samples approximately 10,000 shipments each year. Of this number, 4,000 samples are collected in

California. FDA samples only a small number of processed foods and only on an exception basis. FDA relies on communication from EPA regarding those pesticides or foods which should be targeted for special monitoring.

FINDINGS AND RECOMMENDATIONS

Finding #1: FDA's program for monitoring pesticide residues in imported foods is not equivalent to California's monitoring program.

Recommendations: We recommend that:

A. The Governor and the Legislature petition FDA to expand its monitoring program to the level of California's for foods imported from Mexico.

B. CDFA establish a monitoring station at the Mexican border to monitor imported produce until such time as significant improvements in federal monitoring and enforcement are attained.