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ETHYLENE DIBROMIDE (EDB)  
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Ethylene dibromide (EDB) has been produced in the United States since the mid-1920s. Currently most EDB is used as an additive to leaded gasoline, but approximately 10 percent is used as a pesticidal fumigant in citrus groves and in grain and milling equipment. It is this latter use which has recently become the center of controversy. Laboratory animal tests have shown EDB is a highly potent carcinogen and mutagen and can cause reproductive problems. Concern has arisen over both pesticide workers' exposure to the chemical and EDB contamination of food stocks and groundwater. The Environmental Protection Agency has imposed an emergency ban on most agricultural uses of EDB.

This Info Pack contains background material on EDB and the controversy surrounding it. Additional information may be found in a public library by consulting such sources as the Public Affairs Information Service Bulletin, the New York Times Index, and the General Science Index.

Members of Congress desiring additional information on this topic may call CRS at 287-5700.

We hope this information is helpful.

Congressional Reference  
Division



# EDB Contamination Kindles Federal Action

*After 7 years, the Environmental Protection Agency finally proposes a complete phaseout of the pesticide, but that upsets USDA*

Florida's recent action in banning the sale of more than 70 grain products contaminated with the pesticide ethylene dibromide (EDB) has brought to the boil an issue that has been simmering on the back burners of federal regulatory agencies for 7 years. The Environmental Protection Agency (EPA) first moved to control uses of EDB in 1977, but protests from manufacturers and users and lack of attention during the first 2½ years of the Reagan Administration have so far thwarted federal action.

Florida decided to take matters into its own hands and pulled off grocer's shelves a variety of nationally marketed grain products under brand names such as Betty Crocker, Aunt Jemima, and Pillsbury. Other states have since found EDB-tainted products in their territories, which has sent EPA scrambling to determine what levels of the pesticide should be permitted in food. Farmers and food manufacturers, fearing that the agency could declare a large portion of the nation's grain supply inedible, have called on Secretary of Agriculture John Block to press their case with EPA administrator William Ruckelshaus.

EDB is a popular pesticide because it

is effective and versatile. For the past 40 years, farmers have applied EDB to control insect infestation in stored grain. For 20 years, many grain companies have fumigated milling machinery with the chemical. More recently, use of the pesticide has broadened. Farmers in the Southeast and Southwest have injected EDB into soil to kill nematodes before planting crops. During the 1981 medfly crisis, California fumigated fruit grown in-state with EDB and subsequently required imported fruit—primarily that shipped from Florida and Texas—to undergo EDB fumigation. Florida and other states also fumigate citrus fruit shipped to Japan.

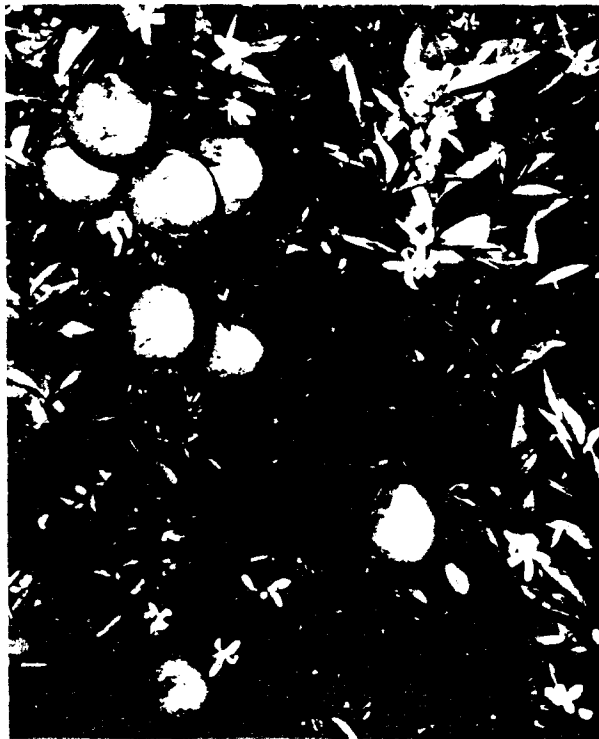
State and federal officials now realize that EDB's extensive use has led to a widespread problem. A significant portion of the country's processed grain products may have some contamination, according to EPA's expert on the pesticide, Richard Johnson. So far, he says, 30 percent of the packaged grain products tested by various sources show contamination. (Preliminary studies by Florida indicate that cooking may dissipate about 80 percent of the pesticide, but more experiments are being conducted.)

Last summer California, Florida, Hawaii, and Georgia discovered that ground water in various areas was polluted with EDB from soil fumigation. Most recently, California announced that Florida citrus shipped to the state had worrisome EDB concentrations in the pulp.

The danger to humans from low-level, long-term exposure is not yet clear because no reliable epidemiological studies are available. But according to EPA documents, animal studies demonstrate that EDB is highly toxic. Experiments show that the chemical causes cancer, gene mutations, and reproductive damage in a variety of animal species. Studies by federal agencies in the 1970's indicated that the pesticide is carcinogenic in rats and mice at 20,000 parts per billion (ppb). If EDB were a new chemical, it would never pass muster with current environmental law, according to several federal environmental officials.

Given the animal data and the recent reports of contamination in water and food, EPA officials are now trying to decide whether the agency should issue stricter regulations by declaring an immediate end to all uses of the pesticide. In September, it banned the sale and distribution of EDB as a soil fumigant and said it wants a phaseout of other uses over the next year. The phaseout, however, has been appealed by members of the agricultural community, the chemical industry, and the U.S. Department of Agriculture (USDA). This could delay full cancellation of all EDB use until 1986. EPA's task is also complicated by the fact that the Reagan Administration's Caribbean Basin initiative promotes the importation of tropical fruit from Caribbean countries. USDA import regulations cannot be met without use of the pesticide. The U.S. Agency for International Development, at the urging of USDA, is currently deciding whether it too should appeal EPA's action.

EPA officials are also working feverishly to determine what concentration of the pesticide should be allowed in food because currently there is no federal tolerance standard for EDB. Florida officials, without waiting for federal guidance, concluded that 1 ppb is unacceptable. The 76 products that were banned contained an average range of 15 to 20 ppb of the pesticide, but one food sample went as high as 755 ppb. The Grocery



*In the late 1970's, researchers discovered that EDB doesn't dissipate in food as previously assumed. Pesticide residues can persist in fumigated citrus fruit for several days and in grain for months.*

Florida Division of Tourism

Manufacturers of America, a national trade group, is fighting the ban tooth and nail but so far has been unsuccessful in obtaining a federal injunction. EPA is expected to announce a standard within the next month.

Regulatory action on EDB has been impeded by two factors. When EPA suspects that a pesticide poses an unacceptable health hazard, federal law requires it to develop regulatory proposals by weighing the risks and benefits and then seeking public comment. In the case of EDB, industry objected at every step of the way. And under former EPA administrator Anne Burford further progress came to a virtual halt.

After EPA gave notice in 1977 that it intended to regulate the pesticide on the basis of the animal data, the process from start to regulatory finish was to last 43 weeks. The procedure bogged down immediately. Industry inundated the agency with documents disputing the findings. It also insisted that there were no good alternatives to replace the pesticide. Three years later, EPA had completed only the first step of the review.

In December 1980, just before the Carter Administration exited, the agency issued a comprehensive report that rejected almost all the criticisms raised by the chemical companies and the agricultural community and went on to propose greater restrictions on EDB's use. The report, written by Johnson, proposed severe limits on EDB's use as a soil fumigant. At that point, EPA did not call for an outright ban because it lacked firm evidence of ground water pollution. It also recommended a gradual elimination of EDB as a fumigant of stored grain, milling machinery, and citrus fruit, arguing that the potential economic losses would be negligible to farmers and others. It proposed a phaseout in 3 years to allow the food industry sufficient time to develop alternatives to the pesticide. In the long run, EPA contended, the health risks far outweighed the financial considerations. The agency came to this conclusion after it uncovered some startling findings.

For decades, it was generally assumed that the pesticide was volatile and left no residue in food. In the late 1970's, however, a number of researchers discovered that the pesticide does not dissipate. One study showed that EDB persisted in wheat with levels reaching 500 ppb 3 months after fumigation. EPA's own scientists confirmed the problem of contamination. From a USDA laboratory, EPA officials obtained batches of wheat flour that had been distributed across the country as part of federal food

subsidies, including the School Lunch Program. EPA scientists reported in 1980 that all the samples contained the pesticide. (Later analyses in 1981 revealed that some of these wheat samples contained up to 4200 ppb. The samples were then made into biscuits, which registered levels averaging about 37 ppb.) Armed with the 1980 information and results from several other studies on EDB residue in grain and citrus fruit, the agency calculated that exposure to the pesticide in an average diet could increase a person's risk of cancer by a factor of 3 in 10,000. In the past, an increased cancer risk of even 1 in 1,000,000 triggered regulatory action.

The agency's recommendations were coldly received by the new Reagan appointees. Block wrote EPA, prior to Burford's arrival, that the proposed cancellation was unacceptable because al-

ternatives could not be developed by the 3-year deadline even though EPA had concluded the industry could substitute other pest control methods for the pesticide. He said the proposal would also place financial burdens on the food industry. He did not acknowledge EPA's concern about the health risks of the pesticide through dietary exposure, except to state that he wanted more data to determine residues in food.

The pesticide issue was also stymied at EPA by John Todhunter, then head of the Office of Pesticides and Toxic Substances, who resigned in the wake of Burford's controversial departure. A hearing held in September by Representative Mike Synar (D-Okla.), chairman of a subcommittee of the Government Operations Committee, revealed that Todhunter had demanded numerous revisions of the agency's EDB report.

## Florida Flip-Flops on EDB

Florida seems to want to have its cake and eat it too when it comes to the issue of ethylene dibromide. On one hand, the state's agriculture department acted aggressively and banned the sale of food products that contain minute amounts of EDB. On the other, the department is also trying to protect the state's profitable citrus and vegetable crops and has repeatedly objected to stricter regulation of the pesticide by the Environmental Protection Agency (EPA). The discrepancy between Florida's actions on the pesticide stems from the existence of two separate groups of officials within the state's department of agriculture that apparently do not see eye to eye on EDB.

One branch, the department of citrus, has consistently argued that the economic and agricultural benefits of EDB far outweigh any health hazard. It maintained this position even though studies in the late 1970's showed EDB residues persist in fumigated fruit. California, however, reported in December that recent shipments of Florida citrus were tainted with unusually high levels of EDB and expressed concern. Florida subsequently ceased shipment of all EDB-fumigated fruit to California until the federal government develops a tolerance level. This loss of market could cost the Florida citrus growers, already hard hit this winter by freezing weather, millions of dollars.

The citrus department's attitude toward EDB contrasts markedly with its bureaucratic sibling, the department of health and rehabilitative services. EDB "has no business being there [in food]," states Thomas Atkinson, chief of the state's environmental epidemiology branch. How does one account for the difference of opinion between the two departments? One possible explanation is that the ban on EDB-contaminated grain products doesn't inflict major losses on the state's own economy, while cutting off exports of EDB-fumigated fruit does.

Florida has another headache related to EDB. Farmers have used the pesticide extensively as a soil fumigant. Studies completed since last summer show that 500 wells in 12 counties have detectable levels of EDB. One well had concentrations in a range of 300 to 600 ppb, according to EPA chemist Stuart Cohen. The severity of the problem may stem from a bureaucratic snafu by the USDA and EPA. A USDA handbook contained instructions to apply the pesticide much more frequently and at higher concentrations than EPA recommends. Farmers apparently heeded the agriculture department.—M.S.

Synar also presented documents indicating that Todhunter and associates held private meetings with members of Florida's citrus growers and vegetable industry. Todhunter at the hearing denied he attended some of the meetings; another, he insisted, had no influence on the agency's decision-making. According to recent interviews with EPA officials, Todhunter also gutted the agency division in charge of handling these types of special pesticide reviews. Although the agency had some 90 pesticides on a roster for reexamination, Todhunter slashed the staff from 128 to about 20.

Time trickled away until last summer when California reported ground water contamination. The discovery was "the straw that broke the camel's back," said Johnson, who is still head of the agency's EDB team. After a 3-year hiatus, the agency set to work on a new set of regulations. In 2 weeks, Johnson and colleagues produced another lengthy report and pushed even harsher rules. Based on additional information, EPA calculated that the cancer risk was an order of magnitude higher than its 1980 estimates.

Again, the citrus industry, farmers, and chemical companies objected and have formally appealed EPA's action on the grounds that there are no good alternatives to the pesticide. USDA, which recently held private meetings with industry, has also intervened. Settling the differences could take another 2 years, but the revelation of EDB-tainted food and heightened public awareness may speed up the process.

EPA has said that several methods show promise as a substitute for EDB fumigation, but they have all been pooh-poohed by the agriculture department. According to EPA, citrus fruit could be treated by irradiation or another procedure that subjects fruit to cold temperatures; for stored grain, other chemicals could be applied. Florida citrus growers protest that without EDB, they will lose the \$25-million grapefruit market in Japan. The Japanese government, however, has accepted citrus fruit treated by the cold storage method "for a long time," says Hisao Azuma, an agriculture official at the Japanese embassy in Washington.

Despite EPA's desire to regulate the pesticide since 1977, efforts at USDA to help farmers and citrus growers develop other methods have been meager, according to a recent study on EDB by the General Accounting Office. In a briefing submitted last spring to Representative George Brown, Jr. (D-Calif.), chairman of the Agriculture Committee's subcom-

mittee on research, the General Accounting Office said studies by USDA have "been limited to short-term research projects. . . . This crisis-oriented research resulted in the postponement of broader-scoped, long-term research." It noted that since 1977, it has twice advised USDA to develop an agency-wide plan for research and development, but to no avail. An EPA official recently put it this way, "Without an all-out cancellation industry wouldn't consider alternatives. Now we're canceling and they're screaming there are no alternatives."

The General Accounting Office also faulted EPA's regulatory process. It cited several problems, concluding that the agency has "emphasized starting, but not completing the process, planned poorly, [and] not resolved several important policy and procedural issues. . . ."

One interesting fact in EDB's regulatory history is that the House Agriculture Committee, which has jurisdiction over pesticide use, has yet to examine the problems with the pesticide and EPA's role. Despite the strong criticisms by the General Accounting Office, Brown did not pursue the matter with his usual keen interest in pesticide problems. Some sources allege that other committee members told Brown to lay off EDB because of its wide importance to their constituents, but Brown denies this. Nevertheless, Synar and other legislators are going after the topic. Senator Dave Durenberger (R-Minn.), chairman of the oversight subcommittee of the Environment and Public Works Committee, will hold an EDB hearing on 27 January.

EPA is now pondering what to do next. On the issue of citrus fumigation, Edwin Johnson, head of EPA's Office of Pesticide Programs, says that the agency may choose a tolerance standard "at the lowest level we can set and still fumigate effectively." With grain products, Richard Johnson believes that Florida's cut-off point of 1 ppb is probably too harsh. Although he had hoped that EDB's use as a grain and citrus fumigant would have ended last summer, Johnson says 1 ppb standard would be too disruptive to the nation's economy and its food supply. "We are not dealing with a crisis [to health]," he said. Noting that the agency has already taken 7 years to achieve any substantive regulation of EDB, "Another year is not going to make that much difference." Meanwhile, the special review process at EPA has not been overhauled, its staff has not been reconstituted, and the list of pesticides slated for reevaluation continues to grow.

—MARJORIE SUN

## Spotlight on Pest Reflects on Pesticide

*Use of ethylene dibromide in Medfly quarantine has impact on regulatory process, other side effects*

The Reagan Administration entered the regulatory arena a year ago with the emphatically stated purpose of ensuring that the costs of regulation were fully weighed against its benefits. One of the decisions facing it involved a chemical called ethylene dibromide (EDB), which has been at the center of a regulatory battle since the mid-1970's and gained

special notice last year during the Medfly crisis in California. EDB is the kind of compound offering both high risks and high benefits that can render such decisions hard to make.

EDB is one of the most effective and widely used pesticidal fumigants for fruits and vegetables. It is also highly controversial because animal tests have

indicated that EDB is a carcinogen and mutagen and causes reproductive problems. Both the federal Environmental Protection Agency (EPA) and the Occupational Health and Safety Administration (OSHA) have proposed stricter regulation of EDB. The EPA, in fact, in 1980 proposed suspending the use of EDB as a fumigant for grain immediately and for citrus fruit in mid-1983.

A major difficulty in dealing with EDB is that no ready alternative is available. EPA's proposal to ban EDB in 1983 as a fumigant for citrus fruit is based on the assumption that irradiation of produce with gamma rays will be scientifically and commercially feasible by then. However, despite recent developments that appear to markedly improve prospects for wider use of gamma irradiation in the United States, EPA's upbeat view on timing has been widely questioned.

Although the regulatory tussle over EDB began in the mid-1970's, it received little public attention until last year, when EDB was used as a citrus fumigant in California to counter the Mediterranean fruit fly. That action, which was taken to comply with federal Medfly quarantine restrictions, raised the economic and political stakes in the EDB case, prompted an interstate wrangle over shipments of fumigated fruit, and dealt a serious setback to the lucrative export of



USDA

**Still life with Medflies**

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California produce to Japan (see box below). Use of EDB in California also led to a sharp public dispute between an EPA scientist and agency officials over the degree of hazard posed by EDB. Such differences can be difficult to resolve under existing law.

EDB is a synthetic organic chemical (1,2-dibromoethane) used primarily in an antiknock additive to gasoline. Other uses, besides treatment of produce, include fumigation of stored grain, pre-planting treatment of soil to protect

against nematodes, and treatment of stored logs and flour mill machinery. Only about 10 percent of the EDB manufactured is used in pesticides.

As a pesticide, EDB is regulated under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). Since 1972, when strengthening amendments were added, pesticides already on the market must be deemed safe to win "reregistration." The lawyerly name for the registration process is Rebuttable Presumption Against Registration (RPAR), which

provides opportunities for comment from both sides at each major stage.

The first challenge to EDB came from the Environmental Defense Fund, which in the mid-1970's petitioned to have EDB's registration as a pesticide canceled mainly on the grounds of a National Cancer Institute (NCI) study showing that the chemical was a cancer-causing agent.

The 1977 study showed a statistically significant increase in squamous cancer cells in the forestomach of rats and mice

## EDB Causes a Regulatory Ripple Effect

The controversy over ethylene dibromide (EDB) was carried to California on the wings of the Mediterranean fruit fly. A regulatory ripple effect began last summer when the state Air Resources Board expressed concern about the containment and recovery of gases that would be produced in a massive EDB fumigation program required by a Medfly quarantine. California's Occupational Safety and Health Administration (Cal OSHA) responded in September by proposing a drastic tightening of standards for EDB vapor in ambient air to 15 parts per billion (ppb) from the prevailing federal OSHA standard of 20 parts per million.

Cal OSHA's proposal, which did not bear a specific scientific rationale, was parried by the state Office of Administrative Law, which acts as a watchdog agency on regulatory matters, and a less rigorous standard of 130 ppb was set. This accorded with a 1977 recommendation emanating from the National Institute for Occupational Health and Safety.

Cal OSHA, meanwhile, had circularized employers and workers about the dangers of EDB; one result was that longshoremen refused to load fumigated fruit being exported to Japan. News of the EDB controversy also reached Japan, where dockworkers refused to handle fumigated fruit arriving in their country until Cal OSHA exposure standards were adopted. They were. The Japanese government, however, was concerned to keep out the Medfly and insisted on EDB fumigation of all fruit from California, not simply from the quarantined area.

Citrus exports to Japan are important to California agriculture since they total about \$100 million a year; exports of lemons account for about two thirds. The lemon crop was heavily affected since the bulk of lemon exports to Japan are shipped in late summer and autumn when the new restrictions took effect. Losses are estimated at more than \$16 million last year.

The Cal OSHA standards also had consequences closer to home. The new restrictions inspired a boycott in California of produce shipped in from Texas and Florida, both of which have their own EDB fumigation programs. High EDB residues were not the main bogey. The new Cal OSHA rules specified that work areas in which EDB vapors might be present must be placarded with warnings of the dangers of exposure. California supermarket chains apparently decided that such placards would alarm workers and customers and, conceivably, if the placards were missing, open the way to lawsuits. To avoid the problem,

the chains decided simply not to handle the produce from out of state.

Events in California also had an impact on the federal Occupational Health and Safety Administration. Last September the International Brotherhood of Teamsters filed a petition asking for an emergency temporary standard reducing the permissible EDB exposure level to 15 ppb for an 8-hour day. This sparked a federal OSHA review of EDB.

OSHA often takes cues on determination of hazards from EPA, but operates its own parallel regulatory process since it is responsible for setting ambient air standards to protect workers who come into contact with pesticides on the job. On 18 December, OSHA announced that the results of studies on experimental animals "indicated that present permissible exposure levels for EDB of 20 parts per million (ppm) as an 8 hour average . . . exposure does not provide exposed workers adequate protection against cancer and other health effects." OSHA asked for comments to be submitted by the end of February and then on 26 February extended the deadline to 31 March. As for the original Teamsters petition for a temporary standard, however, OSHA denied the request on grounds that very little information was available about the nature and extent of employee exposure to EDB on a nationwide basis.

The EDB controversy had received national attention, however, and a high-level interagency task force was formed last autumn under the aegis of the White House Office of Science and Technology Policy to look at the problem. The task force ended its labors without making any direct recommendation on regulatory issues, but it did inspire some specific studies to determine actual exposure levels, including efforts to follow fumigated fruits cross-country and measure the persistence of EDB residues in trucks, warehouses, stores, docks, and ships. The results should help narrow the information gap and be taken into account in the final EPA decision.

On the export fruit, negotiations with the Japanese early this year apparently alleviated difficulties somewhat. The Japanese agreed to allow cold treatment of citrus fruit on the passage to Japan. Lemons from outside the regulated areas in California will be allowed into Japan unfumigated until 10 April, when the matter will be reviewed. That is about the time a new generation of Medflies will be emerging—if they have survived the spraying campaign and the winter—to begin a new chapter for the Medfly and EDB.—J.W.

that had been fed on the compound. Later studies by Midwest Research Institute and NCI demonstrated that inhalation of EDB increased tumors in several sites in experimental animals. Evidence of the mutagenic potency of EDB and of reproductive disorders in bulls and rats induced by EDB were also cited.

Cancellation of registration for a pesticide requires a determination that the

pesticide "no longer satisfies the statutory standard for registration." According to FIFRA language, that occurs when there is "an unreasonable risk to a man or the environment, taking into account the economic, social and environmental costs and benefits of the use of any pesticide." In other words, the law clearly states that the benefits of continued use must be weighed against the potential hazards.

The FIFRA standard is obviously much less clear-cut than that set by the Food, Drug, and Cosmetic Act which, through the so-called Delaney clause, forbids the presence of any element that is shown to cause cancer in animals regardless of level of exposure.

In December 1977, EPA published a notice that it was starting the RPAR process for EDB and invited interested persons to submit rebuttals or other information on hazards. Three years later, in December 1980, the agency took the next major step by announcing the availability of a "position document" setting forth EPA's review of the evidence.

The EPA notice said "the Agency has concluded that the presumptions for oncogenicity, mutagenicity and reproductive disorders have not been rebutted." Also announced was a "preliminary decision" to cancel use of EDB on stored grain immediately and on citrus and tropical fruits effective 1 July 1983. Other uses would be continued but on a restricted basis.

There is little disagreement that more information on EDB residue levels is needed or that workers could be better protected. Nor, in fact, is anyone really arguing that EDB is a benign chemical. The 1980 EPA notice says flatly, "It should be emphasized that the Agency believes that, in the long run, measures short of outright cancellation will not reduce the risks sufficiently to alter the conclusion that the use of EDB for quarantine fumigation of citrus, tropical fruits, and vegetables poses unreasonable adverse effects on the environment."

What to do in the short run, however, is the issue. Both the Secretary of Agriculture and the FIFRA scientific advisory panel, whose comments are formally required in the RPAR process, last spring recommended continued use of EDB on citrus. In both cases, lack of an acceptable alternative was cited as the major reason.

The advisory panel's statement notes the difficulty in evaluating the feasibility of using irradiation as an alternative to EDB and says no other alternative has been "demonstrated to be efficient, practical, and feasible from a cost standpoint."

Robert Metcalf of the University of Illinois, a member of the advisory panel when it made its recommendations on EDB, said that the committee agreed that the substance is a carcinogen and a mutagen and that it produces adverse reproductive effects. He says that EDB is chemically very like dibromochloropropane (DBCP) which was canceled by

## Nonproliferation Post Vacant

The State Department official who had been expected to take the lead in putting the Reagan Administration stamp on U.S. nuclear nonproliferation policy has been relieved of that responsibility. James L. Malone will continue to head the U.S. delegation to the Law of the Sea negotiations, which are now in progress, but will be replaced in the sub-Cabinet post of assistant secretary for Oceans and International Environment and Scientific Affairs (OES).

No successor to Malone has been named and his removal leaves in question the direction of U.S. policy for nonproliferation and reopens the chronic question of the status of science and technology in U.S. diplomacy.

Assignment of Malone full-time to Law of the Sea duties was attributed by a State Department spokesman to the need for the negotiations to have the "full and undivided attention of the senior U.S. official." Sources at State say that the decision to move Malone was made after President Reagan's announcement on 29 January that the Administration was determined to see negotiation of an "acceptable treaty" from the U.S. point of view (*Science*, 19 March, p. 1480).

State Department spokesman Dean Fisher on 9 March rejected outright a *Washington Post* report on the previous day that Malone had been removed from the OES post because he had not succeeded in increasing exports of U.S. nuclear technology.

Malone has been identified with proposals to consolidate in the State Department authority over nuclear exports which is now shared with the Nuclear Regulatory Commission (NRC). Malone was a member of the Reagan transition team for the State Department and Arms Control and Disarmament Agency and is said to be the author of the team report that put emphasis on more vigorous promotion of nuclear trade. Since his confirmation to the OES post last May, Malone has been the most active Administration spokesman on nonproliferation policy.

As to who will exercise principal influence in nonproliferation affairs at State in future, speculation centers on Under Secretary for Management Richard T. Kennedy. A former NRC commissioner, Kennedy is known to be interested in nonproliferation issues. He was ceded general oversight of nonproliferation issues early in the Administration and has worn an additional hat as ambassador to the International Atomic Energy Agency in Vienna, which deals with nuclear safeguards. But his chief duty, managing operations of the department, was thought to leave him little time to devote to making nonproliferation policy.

There is some irony in the timing of Malone's reassignment since it occurred just as three appointees to staff positions with key responsibilities in nonproliferation matters had joined OES after long delays.

OES is formally responsible for a wide range of issues involving science and technology and foreign policy. But Malone's early departure and the preoccupation of the office with Law of the Sea and nonproliferation issues in the first year of the Administration has rekindled long-term concerns about the capacity of OES to play an effective role for the United States in behalf of science and technology in international affairs.

—JOHN WALSH



voluntary action of industry except for minor use on pineapples in Hawaii. Metcalf said the committee assumed that the similar uses of EDB would be canceled. But, says Metcalf, "the alternatives are as bad or worse" and the committee reluctantly recommended EDB's continued use during a phaseout. Metcalf says the committee was "very concerned about worker protection," meanwhile, and urged requirements for "better protective clothing and for EDB application by remote control technology."

Defenders of EDB have pointed to the lack of convincing epidemiological data demonstrating that EDB poses a hazard to humans and they suggest that this vitiates the animal studies. In response, the panel's statement includes this comment:

The Panel notes that it will be very difficult to conduct epidemiological studies that will enable EPA to ignore the results of animal studies. Such epidemiological studies which have been conducted thus far do not provide convincing evidence that animal tests do not accurately predict potential human hazards in the area of oncogenicity and reproductive effects. Therefore, it is necessary to regulate on the basis of animal studies alone.

The FIFRA scientific advisory panel has not been active in the recent period of mounting controversy over EDB. Last spring the new Administration decided to dissolve the panel and replace its members with appointees of their own choosing. A list of nominees was published in the *Federal Register* to invite public comment, but a new panel has not yet been named.

The 1980 EPA notice called for comments on the proposals to restrict use of the pesticide. Now, more than a year later, the books are still open on EDB.

EPA moved against EDB during the last days of the Carter Administration, and it is not surprising that the new Administration took no immediate action on the pesticide. Then last summer the Administration's first public pronouncement on EDB appeared to downplay the hazards associated with its use. This pronouncement, in the form of a "note to correspondents," focused on exposure hazards and was issued last August in the midst of media attention to the controversy in California over the safety of EDB fumigation.

Attributed to John Todhunter, then acting administrator for pesticides and toxic substances and later confirmed to the post, the notice said that "if the fumigated fruit is allowed to stand in storage or transit for a sufficient time (4 to 8 days usually), the risk is minimal."

This comment and the rationale sup-

porting it triggered objections from EPA senior scientist Adrian M. Gross, who was then working in the hazards evaluation division. Gross made public a ten-page memo to EPA Administrator Anne M. Gorsuch in which he argued that the cancer risk from short-term exposure to EDB is very high. Basing his attack on NCI studies, Gross criticized as unsound a risk model favored by Todhunter that was based on an assumption that risk levels decay exponentially as exposure time is reduced.

The impending decision on EDB is not solely a scientific one; rather it is a risk-benefit determination that FIFRA requires but gives little guidance in mak-

ing. Steven Jellinek, the EPA assistant administrator with responsibilities for pesticide regulation in the Carter Administration, says EDB is unquestionably a "hot chemical." There are "not a lot of equivocal studies" that put pathologists and toxicologists at odds. Still, EDB presents real difficulties in terms of "complexity and uncertainties of decision-making." The "toughest decision," says Jellinek is "how heavily to weight the benefits from citrus fumigation," particularly in view of the importance of exports to Japan.

The most difficult issue in pesticide regulation, says Jellinek, is "how do you decide on a risk-benefit evaluation of a

## NAE Elects New Members

The National Academy of Engineering has elected 49 engineers and 6 foreign associates. This brings the total U.S. membership to 1109, with 97 foreign associates. Following is a list of the new members and foreign associates:

**Jan D. Achenbach**, Technological Institute, Northwestern University; **Mih-ran Agbalian**, Agbalian Associates, Engineers and Consultants, El Segundo, Calif.; **Gilbert Y. Chin**, Bell Laboratories, Murray Hill, N.J.; **William C. Dietz**, General Dynamics Corp., Convair Division, San Diego; **Floyd Dunn**, University of Illinois, Urbana; **Peter S. Eagleson**, Ralph M. Parsons Laboratory, Massachusetts Institute of Technology; **John E. Flipse**, Texas A & M University; **Fred W. Garry**, General Electric Co., Fairfield, Conn.; **H. Joseph Gerber**, Gerber Scientific, Inc., South Windsor, Conn.; **Bernard Gold**, Lincoln Laboratory, MIT; **Kent F. Hansen**, MIT; **Kenneth E. Haughton**, San Jose Development, IBM Corp., Calif.; **Robert A. Henle**, IBM Corp., Yorktown Heights, N.Y.

**R. Richard Hepp**, Lockheed-California Co., Burbank; **Donald R. Herriott**, Bell Laboratories; **Irwin M. Jacobs**, LINKABIT Corp., San Diego, Calif.; **Trevor O. Jones**, TRW, Inc., Solon, Ohio; **Joseph Kestin**, Center for Energy Studies, Brown University; **Milo S. Ketchum**, Ketchum, Konkel, Barrett, Nickel, Austin, Consulting Engineers; **James N. Krebs**, General Electric Co., Lynn, Mass.; **John E. Kunzler**, Bell Laboratories; **Emmett N. Leith**, University of Michigan; **George Leitmann**, College of Engineering, University of California, Berkeley; **William E. Leonhard**, The Parsons Corp., Pasadena, Calif.; **Hudson Matlock**, ERTEC, Consulting Engineers and Geologists, Long Beach, Calif.; **Keith W. McHenry, Jr.**, Amoco Oil Co., Naperville, Ill.; **James R. Melcher**, High Voltage Research Laboratory, MIT; **Douglas C. Moorhouse**, Woodward-Clyde Consultants, San Francisco; **William R. Opie**, AMAX Base Metals Re-

search and Development, Inc., Carteret, N.J.; **Malin K. Oshman**, ROLM Corp., Santa Clara, Calif.

**Walter L. Robb**, General Electric Co., Milwaukee, Wis.; **Stanley T. Rolfe**, University of Kansas, Lawrence; **James F. Roth**, Air Products and Chemicals, Inc., Allentown, Pa.; **Donald G. Russell**, Shell Oil Co., Houston; **William R. Schowalter**, Princeton University; **Judith A. Schwan**, Eastman Kodak Co., Rochester, N.Y.; **John W. Scott**, Chevron Research Co., Richmond, Calif.; **Willard F. Searle, Jr.**, Searle Consortium, Ltd., Alexandria, Va.; **John H. Seinfeld**, California Institute of Technology; **John B. Slaughter**, National Science Foundation, Washington, D.C.; **Victor Szebehely**, University of Texas, Austin; **Julian Szekeley**, MIT; **Gareth Thomas**, National Center for Electron Microscopy, Lawrence Berkeley Laboratories, Calif.; **Allyn C. Vine**, Woods Hole Oceanographic Institution, Mass.; **An Wang**, Wang Laboratories, Inc., Lowell, Mass.; **Paul Weidlinger**, Weidlinger Associates, Consulting Engineers, New York City; **Warren E. Winsche**, Brookhaven National Laboratory, Upton, N.Y.

**Theodore Y. Wu**, California Institute of Technology; **Dante C. Youla**, Polytechnic Institute of New York.

Foreign Associates are: **Gunnar Fant**, Royal Institute of Technology, Stockholm; **Fritz H. B. Ingerslev**, Technical University of Denmark, Lyngby; **Benjamin Levich** (Israef), City College, City University of New York; **Yi-Sheng T. E. Mao**, Railways Research Institute, Beijing, The People's Republic of China; **Zenji Nishiyama**, Nippon Steel Corp., Yokohama, Kanagawa, Japan; **Klaus Oswatitsch**, Technical University, Vienna, Austria.

pesticide?" Perhaps because of the formidable scientific, political, and economic factors involved, the issue has been stuck in a "backwater" as far as policy attention is concerned. Neverthe-

less, a decision on EDB will have to be made. EPA staff expect that the agency's office of pesticide programs will send its recommendations on EDB forward this spring and that a final decision will be

reached by the Administrator this summer. The environmental stance of the new management of EPA will be tested by how it handles what is ultimately a judgment call.—JOHN WALSH

# Gas Tank to Mill to Disfavor, A Chemical's 60-Year Career

By Ward Sinclair  
Washington Post Staff Writer

Ethylene dibromide (EDB), the newest controversial bad apple in America's food barrel, began its ride to notoriety in the 1920s when scientists discovered that its unusual properties made it an ideal additive for leaded gasoline.

EDB was the perfect "scavenger:" it could dissolve minute particles of lead and send them out the exhaust, preventing their accumulation as gunk inside automobile engines.

The chemical worked then, as it continues to work in gasoline, but that was only the beginning. Its rise to controversy stems largely from its identification as a cancer-causing agent in animals that has been used widely in agriculture and food processing.

The Environmental Protection Agency, responding to new concerns about EDB contamination of ground-water sources and threats to human health, suspended its use as a soil fumigant in September. Nearly 20 million pounds a year have been used on citrus, pineapples, cotton, peanuts, tobacco and more than two dozen other fruits and vegetables to protect against nematodes—microscopic roundworms that destroy plant roots.

EPA Administrator William D. Ruckelshaus dropped the other shoe yesterday, suspending EDB's use and sale as a grain fumigant by mills and storehouses to kill weevils and other insects, and proposed residue levels for grain and grain-based foods.

Although EDB was exempted in 1956 from federal food-safety vigilance because scientists contended that it would degrade quickly and not persist in foods, later studies raised questions. By 1974, the National Cancer Institute was warning the EPA that tests proved EDB to be a powerful cancer-causing agent in laboratory animals.

By 1977, the EPA's carcinogen assessment team was reporting "strong evidence" that the pesticide could cause cancer in man. Four years later, the agency had determined that it was also a "potent mutagen"—strong enough that it should be removed from the food chain.

As evidence continued to accumulate, the Carter administration began regulatory moves to withdraw EDB from use. Less than two weeks before President Carter left office in 1981, his aides proposed that the pesticide be removed from use on grain. The proposal was shelved by the Reagan administration's review of all pending regulations, then revived last summer under pressure from states and environmentalists concerned about ground-water poisoning.

EDB's agricultural applications were discovered almost by accident in 1943 by Clyde W. McBeth and Al Taylor, plant pathologists at a U.S. Department of Agriculture experiment station in Tipton, Ga.

Their assignment was to test existing chemicals for use as nematocides—compounds that attack nematodes.

As McBeth, now in retirement in Modesto, Calif., remembers it, he and Taylor received a shipment of EDB from the Dow Chemical Co., which generally is credited with having developed the product at its Midland, Mich., labs in the 1920s. They tried it on their plants.

"It took us one season to determine that it worked as a nematocide," McBeth said. "We tested it in our field plots and got good harvest results."

By 1951, EDB had been registered with the Agriculture Department as a pesticide and it was put to work on farms all over the country. "It was inexpensive, it was effective and no residues were detectable," said Dr. L. Vernon White, veteran nematologist with Great Lakes Chemical, the West Lafayette, Ind., firm that is one of three major producers of EDB. "It was the best of all three worlds."

But, as White pointed out yesterday, that was a different scientific era. Spectacular laboratory advances in residue detection have heightened general awareness of the chemical impurities that may lurk in the cereal box.

"This has become a sociopolitical issue," White said. "As recently as five years ago, our analytical capability was down to 1 part per million. All assumed that EDB was safe. But now we measure parts per trillion."

Meanwhile, as EDB was gaining wider acceptance, major chemical firms came up with another nematocide. "EDB was not proprietary and anyone could develop it," White recalled. The major firms came up with a new product, dibromochloropropane, or DBCP.

One of the developers of DBCP (chemical kin to EDB, DDT, chlordane, heptachlor and other powerful pesticides) was McBeth, who left the USDA after he came up with EDB and went to work for Shell Oil in California.

DBCP had an advantage over EDB: it would attack nematodes without killing the plant, and thus could be applied on the soil surface rather than having to be injected underground. It was simpler to use, although it cost the farmer more.

But then DBCP was discovered to be causing sterility among male pesticide factory workers and production stopped. Citing its cancer- and sterility-causing properties, the EPA suspended use of DBCP in 1979.

Waiting in the wings, with DBCP banned from millions of acres, was its cousin, EDB. McBeth, a sort of foster father of both products, reacted to the Ruckelshaus announcement yesterday a bit ruefully.

"I kind of feel like they've gone overboard. They ought to find out what dosage level causes damage in rats or whatever and relate that to food," he said. "I know of no evidence that EDB is a human carcinogen . . . . But I'm glad I'm not around. When I was working, we measured in parts per million."

WASHINGTON  
POST

2/4/84

P. A 2

# Experts Are Split on Pesticide Risk

By PHILIP M. BOFFEY

Special to The New York Times

WASHINGTON, Feb. 3 — Leading cancer scientists and health advocates disagreed sharply today over how great a threat consumers may face from the pesticide EDB.

Among those who regard EDB, or ethylene dibromide, as an unusually potent carcinogen are Samuel S. Epstein, professor of occupational and environmental medicine at the University of Illinois medical center in Chicago, and Sidney Wolfe, head of Ralph Nader's Health Research Group.

In interviews, they urged consumers to avoid products apt to be contaminated by it.

But the pesticide was deemed a relatively minor threat, at the levels now being detected in food, by three others interviewed. They are Bruce N. Ames, chairman of biochemistry at the University of California's Berkeley campus; Richard Adamson, head of the division of cancer etiology (causation) at the National Cancer Institute, and by Elizabeth Whelan, head of the American Council on Science and Health, a nonprofit group that tries to deflate what it considers "chemical phobia."

Virtually all scientists queried agreed that EDB has been shown to cause cancer in rats and mice. They disagreed over how potent a carcinogen it is and over whether the amounts now being detected in food and water are cause for alarm.

## Test on Animals

David P. Rall, director of the National Toxicology Program, which coordinates all toxicological research for the Department of Health and Human Services, said the pesticide had been shown to cause cancer at the lowest levels tested in each of the Government's three major studies of the substance. He said that a study in which rats and mice inhaled a mixture containing 10 parts per million of EDB found that virtually all developed tumors.

"It's a nasty substance," he said. "It's unusual for virtually 100 percent of the animals to get tumors."

Dr. Adamson, whose unit at the National Cancer Institute has reviewed key data on EDB, said there was "very little doubt that it is a very toxic compound," which causes cancer and genetic damage in animals.

But he said that even the lowest doses used in the tests were at levels of roughly 10 to 50 parts per million, making it difficult to relate them to the parts per billion levels now generally being found in food and in the environment. He also said there is good scientific evidence that cooking destroys 80 percent or probably more than 90 percent of the EDB found in foods.

"I wouldn't panic about buying things from the store or not eating what's on the shelf," he said.

## Sizing Up the Hazards

Dr. Ames, the Berkeley biochemist, said he had been studying the relative potency of pesticides and considered EDB to fall "in the middle range" as a hazard. He called it a thousand times more hazardous than saccharin, a carcinogen whose use is accepted by much of the public, and a thousand times less toxic than aflatoxin, a carcinogen that occurs naturally and is found in peanut butter and other foods.

"My gut feeling is that the public is getting too alarmed over EDB," he said. "It could be an important risk for workers, but it really is a minor risk in food."

Dr. Ames said food contaminated by EDB is "no more dangerous than peanut butter and peanut butter is probably a pretty low risk."

The biochemist stressed that he is an independent scientist who has never consulted for industry.

Dr. Joseph Rodricks, a Washington toxicologist who performed a risk analysis for the Grocery Manufacturers of America, concluded that eating one-and-a-half charcoal broiled steaks a year was more hazardous, because of carcinogens created in cooking, than eating grain-based products, according to a news release from the grocers' trade association.

Similarly, Dr. Whelan of the American Council on Science and Health said: "Under no circumstances would I throw out my muffin mix. We're seeing mass hysteria and panic over EDB. It's all part of the general chemical phobia."

However, Dr. Epstein, author of books on cancer and toxic wastes, advised consumers to stay away from cake and pancake mixes in particular and to demand that food manufacturers and stores label the EDB content of their products.

## Widespread Exposure

He said he viewed EDB as "an extraordinarily potent carcinogen" because it caused tumors in rats and mice in exceptionally short periods, roughly 10 to 24 weeks. He also noted that the public was being subjected to "widespread exposures," because EDB is found in food, ground water in some areas and the air.

Dr. Epstein said, levels up to 700 parts per billion have been found in grain and up to 5,000 parts per billion on citrus fruit.

Extrapolating from a risk analysis performed by the Environmental Protection Agency, Dr. Epstein estimated that EDB might cause 3,000 cancer deaths per year in the United States under "a realistic worst case."

NEW YORK TIMES

2/4/84

p. 9

# EPA Bans Use of EDB On Grain

## Voluntary Limits On Content in Food Are Given to States

By Cass Peterson  
Washington Post Staff Writer

The Environmental Protection Agency yesterday banned the use of ethylene dibromide (EDB) as a pesticide to kill weevils and other pests in grain and issued voluntary guidelines for state officials to use in determining safe residue levels of the cancer-causing chemical in food products.

Maryland, Virginia and the District of Columbia immediately adopted the guidelines, and Maryland warned consumers to avoid several batches of cake and muffin mixes shown to have EDB levels over the recommended limits.

EPA Administrator William D. Ruckelshaus said he believed that the guidelines, if followed, are stringent enough to be "fully protective of public health" during the three or more years it will take tainted grain products to move through the food system.

"Our job is to protect the public health and I think we're doing it," Ruckelshaus said.

But environmental and consumer groups, backed by several members of Congress and some state officials, condemned the guidelines as too lax, virtually unenforceable and likely to lead to a "crazy quilt" of state efforts that could leave millions of Americans exposed to dangerous levels of the carcinogen.

Some of the strongest reactions, however, came in response to Ruckelshaus' announcement that he was not prepared to decide EDB's fate as a fruit fumigant, the pesticide's remaining major use, nor was he ready to set a residue standard for citrus or tropical fruits.

That decision will be announced

"in a few weeks," he said, after more information is collected.

"If 40 parts per billion is unsafe in your breakfast muffin, it is also unsafe in your glass of orange juice," said Sen. David F. Durenberger (R-Minn.), who had urged Ruckelshaus to allow no EDB residues in citrus fruit.

Ruckelshaus said the agency had found residues as high as 1,000 parts per billion in fruit imported from Mexico and Italy.

Imported fruit, which must be fumigated, generally accounts for less than 2 percent of the fresh fruit eaten in the United States, although greater quantities have been imported in recent weeks because of widespread frost damage to citrus crops in this country.

Ruckelshaus' guidelines for grain products would allow 900 parts per billion of EDB in raw grain intended for human use, 150 parts per billion in "intermediate" products such as flour, mixes, partly cooked rolls and frozen bread dough, and 30 parts per billion in ready-to-eat products such as bread, cookies, corn oil and cold cereal.

The standard for grain announced yesterday is nearly double the 500 part-per-billion standard that sources had said earlier this week would be set.

The Agriculture Department also had endorsed a 500 part-per-billion standard for grain.

But, according to some sources, the standard Ruckelshaus adopted is slightly lower than the one sought by the grain industry.

"The industry wanted 1,000 really bad," one source said.

The varying levels were set on the basis of evidence that the pesticide dissipates as grain moves through the milling process and is ultimately cooked or baked.

Florida and Texas, where EDB contamination has been documented in a variety of common grocery items, appeared likely to go along with the guidelines. But Massachusetts and New York officials expressed disappointment with them, and officials in other states said they intended to move cautiously in testing and recalling foods.

"EPA's level is not strict enough to protect the public from cancer risk and, perhaps more importantly, the higher risk of reproductive disorders," New York health department spokesman Peter Slocum said.

Because the guidelines are only advisory, they are not binding on state officials.

"It is important for people to understand that some states have legal authority to set levels tougher than those recommended by the EPA, and other states have statutes that effectively require them to use EPA's regulations," said Joseph A. Kinney, an official with the National Governor's Association.

"It's just not clear what individual states will do," he said.

Ruckelshaus said yesterday that the agency will attempt to make its EDB guidelines mandatory, a process that involves first revoking an exemption that was granted to the chemical in 1956. The process could take six months, assuming no appeals are filed or hearings requested, according to the EPA administrator.

But the Natural Resources Defense Council said it would go to court in an attempt to force the EPA to set stricter, mandatory rules immediately. Council officials contended that the voluntary standards are inadequate to protect the public and will prove unworkable for the food industry.

"Industry will have terrible problems dealing with a confusing and constantly shifting set of state rules," council attorney Jonathan Lash said.

Agricultural organizations and food producers generally supported Ruckelshaus' action, however. An American Farm Bureau Federation official said farmers "can live with" the guidelines, and spokesmen for several of the nation's largest grain-processing firms said they believed that virtually all of their products would pass muster under the voluntary guidelines.

Earlier this week, when sources said that Ruckelshaus would set more stringent standards for grain, markets reacted with concern to the possibility of having to destroy corn, wheat or other products. But U.S. Department of Agriculture officials reassured farmers that tainted grain could be aerated, aged or mixed with untainted grain to make it salable.

"This confirms that our products can be consumed with complete safety," said Dean Belbas, a spokesman for General Mills.

Ron Bottrell, a Quaker Oats Co. spokesman, said his company was "confident that all our products are well within those guidelines."

Patrick Hayes, a spokesman for Procter & Gamble Co., said the EPA's announcement was welcome. Procter & Gamble argued briefly with California officials last week before agreeing to withdraw several muffin mixes shown to have EDB levels as high as 2,200 parts per billion.

"The minuscule levels that may be present in our products are mostly removed in the baking process," Hayes said.

Several industry representatives also said they were pleased that the testing of their products, as well as any recalls, would be handled through standard Food and Drug Administration procedures.

Under those procedures, testing is done at the warehouse, not in food stores, and recalls are handled without public notice.

"From time to time there will be some package somewhere that has EDB," said one industry official who asked not to be identified. "But you don't get into a situation of pulling things off a shelf. That helps build public confidence."

Ruckelshaus yesterday said the agency expected that about 1 percent of wheat-based products on grocery shelves would fail to meet the guidelines. For corn-based products, the percentage of tainted batches is likely to be higher, about 7 percent.

Testing by the Grocery Manufacturers of America Inc. showed that products containing corn or soft white wheat, frequently used in packaged mixes, had the greatest concentrations of EDB. Hush puppy mixes showed especially high EDB residues in the GMA survey: only two of 15 packages tested would meet the 150 parts-per-billion standard for "intermediate" products.

Hard winter wheat, used for most standard flours and baked breads, is hulled, or "tempered," before being milled into flour, and a large amount of the pesticide is removed along with the hull.

The EPA ban of the pesticide applies also to its use on milling and granary equipment to process grain intended for human consumption.

In the wake of the EPA standards, labor union representatives yesterday renewed their petition for an emergency standard governing worker exposures to EDB.

The Occupational Safety and Health Administration proposed a standard last October, but it is not expected to become final for a year or more.

"If they intend to aerate grain to reduce the EDB in it, that will add more EDB to the air," AFL-CIO official Debbie Berkowitz said. "We have 100,000 grain workers out there."

Citrus handlers and truckers also are at risk, according to Berkowitz, who said citrus from Mexico had been shown to have EDB residues up to 16,000 parts per billion in its peel.



By Lucian Perkins—The Washington Post

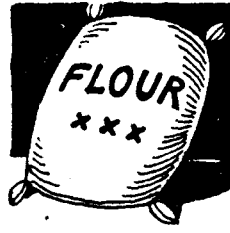
At news conference, Ruckelshaus explains EPA guidelines on EDB-residue contamination of food.

## EPA-RECOMMENDED EDB RESIDUE LIMITS



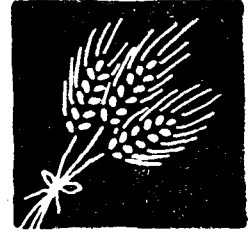
READY-TO-EAT

NOT TO EXCEED  
**30** PARTS PER  
BILLION



INTERMEDIATE  
FINISHED GOODS

NOT TO EXCEED  
**150** PARTS PER  
BILLION



RAW GRAIN

NOT TO EXCEED  
**900** PARTS PER  
BILLION

By Sasha Georgievich for The Washington Post

## U.S. IMPOSES CURBS ON EDB IN FRUIT

Official Says Other Pesticides  
in Use Face New Scrutiny

By PHILIP SHABECOFF

Special of The New York Times

WASHINGTON, March 2 — The head of the Environmental Protection Agency announced rules to curb the use of EDB on fruit today and warned that the nation faced a broad problem from many other pesticides put into use before strict health standards were imposed.

William D. Ruckelshaus, the agency's Administrator, said the lesson to be learned from the experience with the pesticide EDB was that society must be cautious about introducing chemicals into the environment and becoming dependent on their use.

### Expert Panel Sees Problem

As Mr. Ruckelshaus discussed the need to determine the safety of pesticides already in use, a committee of experts assembled by the National Research Council reported that tens of thousands of commercially important chemicals had never been adequately tested for potential health hazards. [Page 10.]

Late last year, some foods were found to be contaminated with EDB, or ethylene dibromide, a widely used pesticide that has caused cancer, gene defects and other illness in test animals. When such chemicals must be removed from the environment because they threaten health, Mr. Ruckelshaus said, the removal process can create "severe problems."

While some pesticides can prove on balance to be beneficial to society, "we have to be careful about introducing pesticides in a massive way into the environment," he said.

About 35,000 pesticides are registered for use, many of them approved before advanced testing techniques were developed to detect small but possibly dangerous residues in food and water supplies. The agency is requiring the older pesticides to be reregistered, but they are continuing to be used while this process goes on.

The agency is still developing standards for retesting most of the pesticides. Once those standards are set, pesticide manufacturers will be required to retest their products. If the pesticides fail to meet the new standards, they will have to be withdrawn from the market.

So far fewer than 80 pesticides have been reregistered. Jonathan Lash, an attorney for the Natural Resources Defense Council, a nonprofit environmental group, said today that at the rate the environmental agency was proceeding, it would take at least eight more years to establish the standards under which most of the chemicals could be reregistered.

In announcing his plans for dealing with EDB in citrus fruit, Mr. Ruckelshaus said at a news conference that his agency was now "going after those high volume pesticides that appear on foods."

He did not mention any specific chemicals, but other agency officials said close attention was being paid to carbaryl, metolachlor, methomyl, butylate, atrazine, cyanazine and sulfur, which together account for about 27 percent of the chemicals used in pesticides annually.

Under the new rules involving citrus products and papayas, the maximum safe level of EDB has been set at 30 parts per billion for edible parts of the fruit. The standard will take effect in 30 days. Mr. Ruckelshaus did not order immediate suspension of the EDB on fruit as he did for grain products last month on the ground that EDB is no longer being used on domestically produced fruit consumed in this country. Cancellation of all uses of EDB on fruit is scheduled to take effect next Sept. 1.

### Proposal in Congress

Legislation has been introduced by Representative Tom Harkin of Iowa and Senator William Proxmire of Wisconsin, both Democrats, to require all pesticides to be reviewed for safety by 1990 and if not reviewed by then to be ordered off the market.

The Reagan Administration and Mr. Ruckelshaus have not taken a position on this legislation, and environmentalists have asserted that this calls into question the Administration's commitment to removing dangerous pesticides. They also noted that the President cut back sharply on the funds requested by Mr. Ruckelshaus for dealing with pesticides in the proposed budget for the fiscal year 1985.

Mr. Ruckelshaus said in a telephone interview that he was not supporting the legislation because he did not think it had a chance of being enacted as a result of opposition from the food and pesticide industries and others. What he proposed to do instead, he said, was to meet with representatives of industry and environmentalists to see if they could work out a compromise that would have a good chance of enactment.

Meanwhile, he said, he will seek to speed removal of dangerous pesticides through administrative actions. He also said he saw nothing wrong with legislation proposed by Representative Henry A. Waxman, Democrat of California, that would give the Administrator of the environmental agency the authority to set maximum levels of pesticides in foods whenever it was determined there was an imminent danger to public health.

Mr. Waxman said in a telephone interview that the EDB episode had shown "there are inadequacies in our law that must be corrected."

"We are seeing the disturbing slowness with which E.P.A. has responded to the pesticide threat," he said.

Albert H. Meyerhoff, a lawyer for the Natural Resources Defense Council, said it would help if Mr. Ruckelshaus proposed new legislation but was skeptical that it would happen. "The time has come for E.P.A. to put up or shut up on pesticide reform," he said, adding that "legislation is needed to put fire under industry to do the tests needed."

Otherwise, he said, "There will be almost certain repetition of the EDB debacle."

### Recall of Cereal

ST. LOUIS, March 2 (AP) — The Ralston Purina Company has recalled more than 17,500 boxes of cereal distributed in 13 states because they contain EDB, but the company said today the product posed no health hazard.

The cereal is Ralston Instant Whole Wheat Hot Cereal in 24-ounce boxes with the code number D019A on top, said a company spokesman, Jim Reed.

The 1,466 cases of cereal represent a portion of the product made Jan. 19 at the company's plant in Davenport, Iowa, Mr. Reed said. It was distributed in New York, Maryland, Florida, Missouri, Illinois, Ohio, Kansas, Oklahoma, Texas, Louisiana, Alabama, Washington and Utah, he said.

Tests on samples of the batch showed levels of EDB ranging from 153 parts to 676 parts per billion, Mr. Reed said. The Federal Environmental Protection Agency last month set an EDB limit of 150 parts per billion in food products that require cooking or baking.

# Patchwork of State Standards Complicates Federal EDB Effort

By Cass Peterson  
Washington Post Staff Writer

More than six weeks after the federal government announced its safety guidelines for ethylene dibromide (EDB) in grain-based foods, the nation is caught up in a patchwork pattern of state enforcement that may actually have increased some consumers' exposure to the cancer-causing pesticide.

State and industry officials confirmed this week that some food products, pulled from grocery shelves in states with tough restrictions on EDB, are being redistributed in states that have adopted the more lenient federal standards or are not aggressively testing for EDB residues.

The result, state officials charge, is that consumers in receiving states have a greater chance of getting food products tainted with EDB, a potent animal carcinogen that has pervaded much of the nation's stored grain because of its wide use as an insect-killing fumigant.

"The industry is telling us that there is no reason they can't sell their products in other states," said Peter Slocum, a spokesman for the New York Health Department, which yesterday adopted standards three times more stringent than the federal guidelines. "They say there's nothing illegal about it, or immoral either."

Ron Botrell, a spokesman for Quaker Oats Co. in Chicago, confirmed that the firm had recycled two of three products that failed to meet Massachusetts' across-the-board standard of 1 part per billion of EDB, the toughest in the nation.

One product, a Flako corn muffin



United Press International

New York Health Commissioner David Axelrod, left, and Agriculture Commissioner Joseph Gerace announce new state standards on EDB at news conference in Albany.

mix that exceeded the federal standard of 150 ppb for products that must be cooked, was destroyed, Botrell said. The other two, a frozen pancake batter and a coffee cake mix sold under the brand name Aunt Jemima, "were sent back to warehouses and ultimately redistributed," he said.

Environmentalists and public health officials warned weeks ago that the Environmental Protection Agency's voluntary EDB standards would lead to uneven enforcement and prompt "dumping" of tainted food in some states.

EPA officials have counseled states not to set more stringent,

(continued)



The EPA's voluntary standards for EDB residues in grain-based foods call for not more than 900 parts per billion in raw grain, 150 ppb in "intermediate" foods such as flour, and 30 ppb in ready-to-eat foods such as cold cereal and bread.

States that have set tighter standards are Massachusetts (one ppb in any food), Maine (30 ppb in ready-to-eat food and 40 ppb in other grain products) and New York (10 ppb in ready-to-eat food, 50 ppb in intermediate food and 300 ppb in grain).

All three of those states, as well as Florida, California, Texas and Ohio, have adopted a zero tolerance for baby foods. California says it will follow federal guidelines on other foods until July, 1985, when it will adopt the tough Massachusetts standard.

Florida, which precipitated the EDB standard when it started recalling products with any trace of the chemical, has since adopted the federal standards for all foods except baby foods.

mandatory standards of their own, however, warning that the impact on interstate food shipments would create more problems than it would solve.

Edwin L. Johnson, head of the agency's pesticide office, told Florida officials in a letter last month that protecting the public from EDB "is

tied at least as much to the intensity of monitoring and enforcement as it is to choosing a lower set of levels."

But while some states have launched strong efforts to enforce either the EPA standards or their own, others are sitting on their hands, suggesting that pick-and-choose marketing practices will continue even after the federal standards clear the last regulatory hurdle and become mandatory in mid-April.

The Food and Drug Administration is gearing up to start enforcing the federal standards, but spokesman James Greene said the FDA will concentrate at least initially on raw grain. That means it will be largely up to the states to enforce the standard on processed products.

At least five states, possibly as many as 10, have not adopted any standard for EDB in grain products, according to EPA surveys. Many states are testing only products already identified as tainted by other states, and some states, including South Dakota, Nevada and Nebraska, are not conducting any tests at all.

In Maine, meanwhile, the standard for raw grain and intermediate foods such as cake mix and frozen bread dough is 3½ times more stringent than the EPA's, and the state permits no EDB in baby foods.

Several other states also have adopted a zero tolerance for baby foods, and California has served notice that it will not permit EDB in any products after July, 1985—about three years sooner than the EPA assumes the chemical will have worked its way out of the food supply.

Yesterday, New York adopted a standard of 10 ppb in ready-to-eat

foods, 50 ppb in intermediate foods and 300 ppb in raw grain, three times more stringent than the federal standard. Gov. Mario Cuomo announced that New York would take the action alone, after failing to persuade five neighboring states to adopt the same standards.

Officials in the tough-standard states contend that their efforts are bearing fruit. "In a matter of a month, EDB levels have decreased considerably," Dr. David Ozonoff, president of the Massachusetts Public Health Association, told a hearing in Boston this week.

Slocum of New York's health department said his state still believes that EPA's standards, designed to reduce a long-term cancer threat, are inadequate to protect the public from reproductive disorders and other short-term health hazards posed by EDB.

"We're testing about 100 samples a week," he said. "Industry says we'll just find a few oddball products, but our scientists argue that it's worth trying to catch even those occasional spikes or aberrations."

For their part, industry officials contend that they are doing their best to comply with the variety of standards. But they acknowledge that food processors are taking pains not to ship tainted foods to states where the products run a higher chance of being detected and recalled.

"It's just the idea of having your brand name impugned," said Roy Henwood of the Millers National Federation, which represents some of the nation's largest food processors. "Everybody's pretty anxious about not shipping into Massachusetts."

# Tests Show Insecticide Substituted for EDB Also Causes Cancer

By Cass Peterson  
Washington Post Staff Writer

Initial laboratory results on methyl bromide, now being used as a substitute for the cancer-causing ethylene dibromide (EDB) to kill insects on milling equipment and citrus fruit, indicate that it, too, is a powerful carcinogen, according to Environmental Protection Agency officials.

The study, conducted in the Netherlands, strongly suggests that methyl bromide has cancer-causing properties "very similar" to those of EDB, said Richard Johnson, head of the agency's EDB task force.

The study was a short-term experiment on rats being conducted for another purpose. But when researchers found cancers in rats autopsied after just 13 weeks, they forwarded the results to a scientific journal. California scientists already have reported to the EPA that methyl bromide is showing up in citrus fruits from Florida, at levels up to four times greater than the EPA has deemed acceptable for EDB. Methyl bromide, like EDB, enjoys an longstanding exemption from residue limits under food safety laws.

The findings confirm the fears of EPA officials, who have frequently warned that banning EDB might prove to be little more than a superficial solution to a serious problem.

"I am concerned that we are merely exchanging the devil we know for the one we don't know," EPA Administrator William D. Ruckelshaus told reporters last month, before announcing sharp restrictions on EDB's use as a fruit fumigant.

But if methyl bromide turns out to be another "devil" in the nation's array of agricultural chemicals, it likely will be some years before the EPA can take action to restrict its use. With EDB, identified as a carcinogen in 1973, the process took more than a decade.

The EPA asked methyl bromide's producers to do studies on the chemical's health effects about four years ago. Those tests are still under way. The agency took the next step, requesting data on methyl bromide's ability to contaminate food, water supplies and soil, less than three weeks ago.

According to Johnson, the producers have 90 days to review that letter and six months to start collecting the information. Until the information is received, the EPA will have little evidence to support a residue limit on methyl bromide in milled grains or fruit.

Edwin L. Johnson, director of EPA's office of pesticide programs, said he didn't know why the agency had waited until now to request residue data on methyl bromide. "I can't give you any excuse on it," he said.

But he said the data should be in within a year, and the agency may be able to move more quickly on methyl bromide in foods than was the case with EDB.

Meanwhile, the disquieting information on methyl bromide is not the only problem confronting the EPA in the wake of its EDB decisions.

Recent laboratory tests, for example, have cast a cloud over the last

remaining pesticide used as an injectable soil fumigant to kill root-eating nematodes.

EDB was banned for use in the soil last September, after tests showed that alarmingly high levels of the chemical were showing up in drinking-water supplies. Officials in Florida and other states were counting on Telone II, a Dow Chemical Co. product, to replace EDB in their nematode control programs, just as EDB had replaced DBCP (dibenzochloropropane) when that chemical was banned in 1979.

But Dow has voluntarily withdrawn Telone II for that use after seeing preliminary results of a National Toxicology Program study showing that it caused a significant number of rare urinary-tract cancers in laboratory animals.

Moreover, the EPA recently discovered that diquat, a pesticide long used in Florida and other states to control aquatic weeds, is contaminated with EDB. While the contamination is believed to be small, perhaps less than 1 percent, both EPA and Florida officials are trying to find out how much of the chemical has made its way into drinking water through the state's ambitious weed-control program.

Meanwhile Florida officials now are considering controlling nematodes by digging deep ditches to prevent the microscopic creatures from spreading out of infested areas and onto the roots of healthy trees.

"It sounds encouraging," said Florida pesticides official Gregory Parker. "And it might be cheaper."