

# The Great Apple Scare

*Robert James Bidinotto*

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On a Sunday night in February last year, the CBS television program "60 Minutes" aired a shocking story. Cancer-causing chemicals sprayed on fruits and vegetables, reporter Ed Bradley told viewers, may be "putting all of us—particularly our children—at risk."

Bradley cited an unpublished report by the Natural Resources Defense Council (NRDC), an environmental group that said the chief danger came from Alar, a growth substance applied mainly to apple trees, and UDMH, a byproduct formed when Alar-treated fruit was processed into sauce or juice.

The NRDC study, Intolerable Risk: Pesticides in Our Children's Food claimed that, because kids ingest more fruits and vegetables for their size than do adults, "as many as 5300 children may contract cancer from their preschool exposure to UDMH." Bradley called Alar "the most potent cancer-causing agent in our food supply."

Next morning, a carefully orchestrated publicity campaign shifted into gear. NRDC findings were announced at news conferences in a dozen cities, and the press played the story big. The Los Angeles Times, for example, reported that "Preschoolers Face 'Intolerable Risk' From Pesticides," while USA Today's lead story was "Fear: Are We Poisoning Our Children?"

Days later, actress Meryl Streep announced the formation of "Mothers and Others for Pesticide Limits." Streep and NRDC officials began appearing on television programs like "Donahue" and "Today."

Panic resulted. From Los Angeles to New York, apple products were yanked from cafeteria counters and grocery shelves. Worried parents flooded physicians' offices and poison-control centers with calls. One mother asked if it was safe to pour apple juice down the drain—or if she should take it to a toxic dump.



Sales of apples and apple juice plummeted. Losses approached \$100 million, bankrupting dozens of family-owned orchards. A bill was introduced in the Senate to ban the use of Alar on foodstuffs—prompting Uniroyal, the chemical's Middlebury, Conn., based manufacturer, to stop selling the product.

Once again, it seemed, an environmental watchdog and a vigilant press had protected us. There was only one problem. Not a shred of credible scientific evidence proved that anyone was ever endangered.

"The NRDC study was nothing more than wild hysteria," says biochemist Bruce Ames, a renowned cancer researcher at the University of California, Berkeley. Most important, the NRDC's campaign to discredit Alar and other agricultural chemicals illustrates what happens when the emotional commitment to environmental protection causes us to disregard scientific facts. And it warns us about zealots who are intent on banning agricultural chemicals even at the expense of our health.

Under Suspicion. The Alar story began during the 1960s in a Bennington, Vt., orchard. There,

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Uniroyal researchers tested a growth agent, daminozide, on apple trees for several years and found it not only reduced spoilage but also improved storage life and resulted in firmer, redder fruit. After Uniroyal tests showed no cancer risks, the federal government approved daminozide under the trade name Alar. It became a hit with the growers.

Then, in the 1970s, Bela Toth, a researcher at the University of Nebraska Medical Center, gave Alar to rodents, and the animals developed tumors. Uniroyal scientists were convinced Toth's studies were flawed because the amounts of Alar the rodents ingested had exceeded the "maximum tolerated dose" (MTD)—the highest dose animals can stand before showing ill effects from simple poisoning. Environmental Protection Agency (EPA) guidelines state that such "exaggerated dose levels" may "bias" health-risk estimates. Nevertheless, Uniroyal notified the EPA of this potential problem, as the law required.

Other studies claimed concentrations of UDMH could increase during food processing. Uniroyal was concerned, but had trouble confirming the tests.

In the early 1980s, the NRDC began an uncompromising attack on farm chemicals. "It may be impossible to define a safe level of pesticide residues in food," wrote Lawrie Mott, who helped launch the organization's pesticide project. When Alar came to the NRDC's attention, it immediately fell under suspicion.

**Disturbing News.** At the time, the EPA was being accused of corruption and weak leadership. William Ruckelshaus became the agency's new administrator in 1983, pledging to get tough. He brought in John Morre to head the Office of Pesticides and Toxic Substances.

"There was great concern," Moore said in an interview, "that my office had rolled over and played dead." A few months after taking over, he put Alar in "special review," which meant the chemical was regarded as potentially dangerous to human health or the environment. Then in August 1985 the agency abruptly announced the cancer risk was so great that use of Alar on food crops should be banned.

When the surprising news reached Uniroyal, then CEO Joe Flannery summoned John Lacadie, a director and development, and Raymond Cardona,

manager of registrations and toxicology. "We're a moral company," Flannery said. "I want you to look me in the eye and tell me this product is safe."

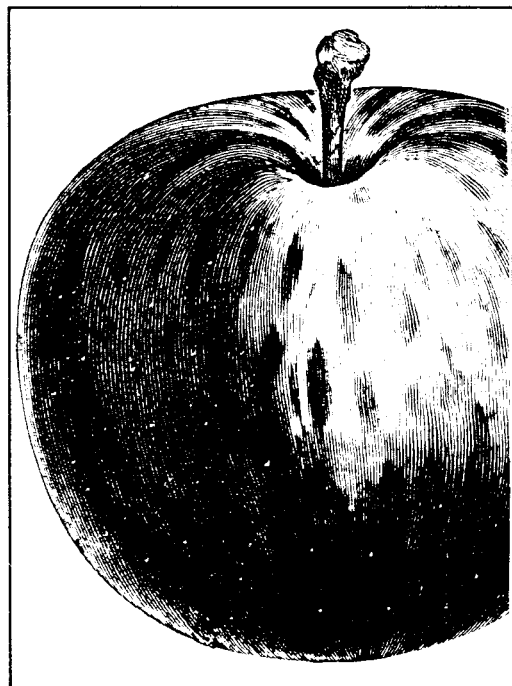
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EPA decisions to ban chemicals are reviewed by a Scientific Advisory Panel (SAP) composed of distinguished scientists nominated by the National Science Foundation and the National Institutes of Health. In September, the SAP met at EPA offices in Crystal City, Va., to review the proposed Alar ban.

After the EPA presented its case, Uniroyal listed the many flaws in five different rodent studies the agency cited. The EPA's own audits of Toth's daminozide study, for example, had conceded that "The MTD appears to have been exceeded" and that "record-keeping was very poor." In one study of UDMH, the treated animals had not been compared with concurrent "control" groups—a violation of scientific practice.

EPA officials expected SAP to rubber-stamp their decision. Instead, after reviewing the facts, the panel concluded unanimously that all five rodent tests could not be used to predict human risks.

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had won out. But after the meeting, Steven Schatzow, then director of the EPA's Office of Pesticide Programs, herded some SAP members into his office. Red-faced and tie askew, Schatzow demanded, "How can you do this to us?" After an angry exchange with the scientists, he concluded, "Look, I can't tell you what to do, but you might like to think about this one again." The scientists were stunned by such flagrant interference, and all refused to back down.

In January 1986 the agency reluctantly delayed its proposed ban. But it ordered Uniroyal to continue testing Alar for cancer-causing properties, and to launch new studies to see if UDMH caused genetic damage.

Stacking the Deck. The NRDC did not wait for further research. The group joined forces with Ralph Nader and other activists to demand Alar be banned. When the EPA refused, they tried scare tactics. In newspaper columns and interviews, they repeatedly labeled Alar and UDMH as "carcinogens." Through letters and calls, they pressed grocery chains and food processors to stop buying Alar-treated produce. And, prompted by EPA comments about the risks Alar posed to kids, the NRDC's Robin Whyatt began research for Intolerable Risk.

Meanwhile, the EPA-ordered studies began rolling in. Three tests to see if UDMH caused genetic damage proved negative. A fourth, initially equivocal, was repeated and also turned out negative.

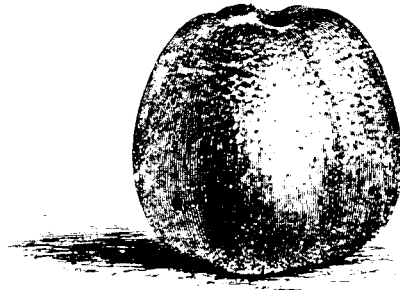
After final cancer tests on rodents had begun in January, 1987, something peculiar happened. The EPA phoned Ray Cardona at Uniroyal and ordered the company to quadruple the UDMH maximum dose levels. Cardona hung up in disbelief. The EPA was stacking the deck.

Uniroyal appealed, but EPA officials refused to budge. Either Uniroyal would boost the doses, or Alar would be banned.

The massive doses eventually generated tumors in the mice—and clear signs that the animals had been poisoned. But EPA now has the "data" it

wanted. In a press release in February 1989, the agency announced it would ban the chemical within a year.

A few weeks later, "60 Minutes" broke the Alar story—and put Intolerable Risk in the media spotlight. The report caused a sensation because it purported to have discovered a hidden cancer danger posed to children by pesticides in general. But unlike reports in academic journals, Intolerable Risk was not screened first by disinterested reviewers. Only after publication did independent scientists have the opportunity to examine it. What they found was appalling.



The report was not based on how much pesticide residue we actually consume. Instead, it used data from inspections of raw produce just after harvest. This greatly exaggerates how much we ingest.

"In most cases," says Ellis Gunderson of the Food and Drug Administration's Division of Contaminants Chemistry, "when you wash fruit or peel vegetables, residues are dramatically reduced."

The NRDC claimed that preschoolers consumed insecticides in amounts up to 92 times the EPA safety levels. But according to federal dietary studies that measure actual pesticide consumption, the combined average in take of these items by two-year-olds was well within safety limits. Toxicologist Chris Wilkinson, in fact, calculated that the NRDC had overstated childhood exposure by an much as 389 times.

The California Department of Food and Agriculture discovered the NRDC had arbitrarily excluded from its study food samples with no detectable pesticide residues. This alone exaggerated pesticide-consumption estimates up to 500 times.

Last December, after the Alar scare became worldwide, an Advisory Committee on Pesticides for the British government reviewed the test data on Alar and UDMH. Its conclusion was unequivocal: "Even for children consuming the maximum quantities of apples and apple juice, subjected to the maximum treatment with daminozide, there

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ALAR was just one battle in the NRDC's war on pesticides. The group helped draft a bill introduced by Congress by Rep. Henry Waxman (D., California) and Sen. Edward Kennedy (D., Mass.) to make it easier for the EPA to ban pesticides. The NRDC also helped draft the pesticide provisions of the California Environmental Protection Act of 1990—a ballot initiative nicknamed "Big Green". If passed by voters this November, Big Green will phase out all pesticides in the state if they "cause cancer" in the same kind of scientifically dubious rodent tests used to ban Alar. The NRDC hopes Big Green will be a model for the nation.

Such extreme measures would be a victory for fear over fact. Consider: "Natural" doesn't necessarily mean "safer." Banning agricultural chemicals may actually pose dangers to our health. For example, apples no longer treated with Alar are more prone to the decay and molds that produce patulin, which is toxic and possibly carcinogenic.

Some "organic food" advocates suggest that instead of using pesticides, we should breed crops that are more pest-resistant. But few people realize that plants produce their own pesticides, and that specially bred plants may have higher levels of those natural toxins.

According to cancer researcher Bruce Ames, "We are ingesting about 10,000 times more natural than synthetic pesticides." And Robert Scheuplein, head of the FDA's Office of Toxicological Sciences, estimates that about 98 percent of the cancer risk in foods occurs naturally. Less than one-tenth of one percent comes from synthetic pesticides.

In April 1989, at the height of the Alar scare, 14 scientific societies, representing over 100,000 pro-

fessional food scientists, toxicologists and nutritionist, issued a joint report. It said the primary hazard present in our food supply comes from bacteria and naturally occurring toxins—not man-made pesticides.

There are only trace amounts of pesticide on the food we eat. Before a pesticide can be applied to food crops, it undergoes stringent tests to determine how much may be safely applied. A "tolerance" level is set, reflecting the government's "acceptable daily intake" (ADI) health safety levels; the ADI, in turn, is usually set 100 times below the levels at which any ill effects were seen test animals. So even if you eat raw, unwashed produce containing the maximum amounts of pesticide allowed, there would be no health risk.

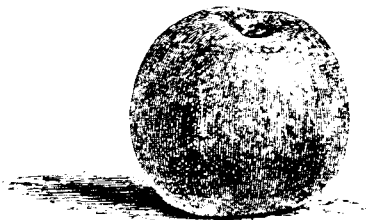
In 1988, the FDA checked some 18,000 crop samples. There were no detectable pesticide residues in 60 percent, and fewer than one percent were "over tolerance." But because of the many safety margins built into the tolerance-setting calculations, even being "over tolerance" does not imply a health risk.

To find out how much pesticide we actually ingest, the FDA conducts Total Diet Studies. Four times a year, the agency buys produce right from grocery stores, then washes, peels and cooks it—exactly as consumers would. The FDA then measures the pesticide residues "at the end." Gunderson says that, in 30 years of these studies, he cannot recall a single case of table-ready food containing pesticide traces above their lawful levels.

The dose makes the poison. Many common, even vital elements in our diets, including vitamin A, calcium, sugar and pepper, cause cancers at very high doses in the lab animals. Fortunately, the human body has many defenses against toxins of all kinds, if the threshold of toxicity is not exceeded.

The NRDC's Lawrie Mott writes that "most scientists believe there is no level of exposure to a carcinogen that is safe." "That's nonsense," declares toxicologist Eugene Paynter, former senior science adviser in the EPA's Health Effects Division. "Almost everything is toxic—or safe—at some level."

These facts did not help the millions of Americans who were needlessly scared about their children's health, or the thousands of apple grow-



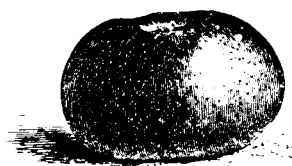
ers victimized by bureaucratic machinations and the media circus. "I thought good science would win out," Uniroyal's John Lacadie now says quietly. "I guess I was naive."

The fear crusade against Alar succeeded. But we should not cave in to the next campaign based on manipulated data and slick P.R. techniques. It is this threat—to common sense—that posed the most intolerable risk.

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## **Roses Are Red? Violets Are Blue?**

*Mark Strefeler  
University of Minnesota*

Recent news releases make it clear that roses may soon be blue and violets...? Well, we will just have to wait and see. The hype surrounding the quest for blue roses has been astonishing, especially in light of recent public outcry against genetic engineering of animals and plants raised for human consumption. I have yet to read any negative press about attempts to genetically engineer roses. It appears that the public feels much more comfortable with the idea of genetically engineered ornamental plants and may actually be inclined to purchase such plants simply for the novelty of having an genetically altered organism.

First, we should ask, how much is hype to sell a new product and the idea of biotechnology to the public, and how much of this type of work can lead to new varieties which are profitable to the commercial grower? Transgenic flowering plants may be big money makers for the biotech firms

but will they really profit the growers? New flower colors may expand the appeal of a particular crop, but if this is at the expense of sales of other crops, there may be no net gain in per capita consumption. Thus, the net economic gain industry wide may be negligible.

Next, we should realize that transgenic plants may not be better or as good as what we already have. I have no doubt that a blue rose will be forthcoming in the future and that it will have a impact on the market, simply on the basis that no other true blue roses (pun, intended) exist. What remains to be seen is whether the color will be aesthetically pleasing or some gaudy blue. How much demand will there be for blue roses in the U.S.—the target market of Calgene Pacific, Ltd. and Suntory, Ltd. is Japan—and what cost per stem will the grower need to charge to make a reasonable profit on blue roses? An Associated Press release stated that the anticipated retail cost

**Transgenic flowering plants may be big money makers for the biotech firms but will they really profit the growers?**

**The anticipated retail cost of a blue rose may be as high as \$80 per stem!**