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Concern Grows in Weed War

What price freedom from dandelions? The EPA is rethinking a long-used herbicide's cancer risk to humans.

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It's that time again--that balmy stretch of late spring when America's war on the dandelion is in full swing. The weapon of choice is the weed killer 2,4-D, most commonly mixed with fertilizer in "weed and feed" treatments. Each year Americans apply an estimated 27 million pounds of it to parks, cemeteries, home lawns and anywhere else mown grass is found.

It is thought to be the most widely used herbicide in the world. The appeal is that 2,4-D, chemical shorthand for dichlorophenoxyacetic acid, is selective: It kills broad-leaf plants such as dandelions but spares grass. It overwhelms the dandelion's hormone system, causing the weed to essentially grow itself to death. This "uncontrolled growth," says Thomas M. Cahill, an environmental chemist at Trent University in Ontario, Canada, is a kind of "cancer for plants."

The question among environmentalists and medical researchers is: Does cancer for plants also mean cancer for people?

The Environmental Protection Agency, which ruled in 1997 that 2,4-D was not classifiable as a human carcinogen, is now reviewing the chemical's registration. Specialist committees are looking at the issue, says Joanne Miller, product manager for the EPA's pesticide registration section. The EPA decision about registration is due in two years. Until then, "the bottom line is: We can't make a call," she says. "We can't rule out, and we can't say for sure."

That uncertainty is roiling the world of American lawn care, where the EPA estimates as much as 20% of world production of 2,4-D is used.

Although 2,4-D has been used for decades, increasingly worried activists at the local level are demanding warning notices when it is used, blocking its use in city parks, and in some cases even getting it banned.

The manufacturers contend that hundreds of studies have shown no danger to humans.

"As long as label instructions are followed, it certainly poses no unreasonable risk," says Don Page, executive director of the industry's task force on 2,4-D research data. "The only verified examples of 2,4-D poisoning in humans is in suicides. If you drink enough of it, you can kill yourself."

Dandelions were not always reviled. Colonists brought the first seeds to North America almost four centuries ago. Early Americans boiled the leaves, battered and fried the flowers and roasted and ground the roots for "coffee." Today, foodies toss leaves in Italian-style salads and hippies make dandelion wine, but homeowners largely regard the plant as a nuisance.

Wind-borne seeds have propagated the plant everywhere in the United States outside the desert and the Arctic, from sea level to 12,000 feet and, most conspicuously, in 30 million acres of residential lawns.

Virginia Scott Jenkins, author of "The Lawn: An American Obsession," credits the golf industry and the U.S. Department of Agriculture with investing in the technology required to sustain all that grass. Scott Co. of Marysville, Ohio, the leading lawn care firm in the country, agrees.

"People were playing golf and they said, 'Gosh, we'd like to have grass like this at home,'" says Ashton Ritchie, a Scott agronomist. "In 1928, we started selling turf builder--fertilizer for lawns--to go along with the grass seed."

The better homeowners got at growing grass, the more vain they became about it, says Stan Spalding, retired UCLA turf breeder. "People were taught by advertising to be proud when they could show their neighbors and friends a pure grass lawn. So dandelion and clover became weeds," he says.

In 1944, a weed killer developed in Britain for wheat farming was reformulated by the USDA for turf and launched on the lawn care market. In 1946, American Chemical Paint Co. released 2,4-D in a product called Weedone with the slogan, "This year have a lovelier, golf-green lawn."

By 1947, Scott had mixed 2,4-D with fertilizer into the first weed-and-feed combination. The company promised customers that they would "get as much of a kick out of putting pesky dandelions to rout as we have."

Hints of Illness Prompt Research

But by the 1980s, question marks were looming over the safety of 2,4-D. In 1986, a study published in the Journal of the American Medical Assn. suggested that Kansas crop workers who had applied 2,4-D had a heightened rate of non-Hodgkin's lymphoma, a cancer of the immune system. A later study also found higher than normal levels of the disease in lawn service applicators. In 1989, the National Academy of Sciences estimated that homeowners are likely to use 10 times more chemicals per acre on their lawns than farmers use on agricultural land.

Amid the furor sparked by the Kansas study, the EPA began its first review of 2,4-D since the chemical's introduction in the 1940s.

Meanwhile, Page, head of the current industry task force, was already working with the leading manufacturers on the issue and eventually coordinated what he estimates were 270 studies on possible toxicity. The biggest four companies--the German firm BASF, Dow AgroSciences in the U.S., Australia's NewFarm Inc. and the U.S.-Argentinian concern Agro-Gor--spent more than \$30 million on the research, he says.

In 1991 the National Cancer Institute suggested that 2,4-D might cause a lymphatic cancer in dogs. It also calculated that diagnoses of non-Hodgkin's lymphoma among farm workers had been increasing 75% in the past 20 years. It attributed part of the rise to better diagnoses but also considered 2,4-D a possible contributor.

Page attacked the cancer institute's canvassing methods, then the interpretation of the results, and accused it of scaremongering to raise research funds.

His task force turned in the last of the 270 toxicity studies in 1995. The results showed that the amount of 2,4-D it took to harm lab animals far exceeded anything expected to be encountered in the environment.

But in 1996, as the cancer risk argument rolled on, University of Minnesota pathologist Vincent Garry published a study in Environmental Health Perspectives showing that 2,4-D might also cause birth defects. Garry found almost twice the number of birth defects among children of pesticide applicators than a control population. The children had been conceived in spraying season in a Minnesota potato and sugar beet farming region predominantly using 2,4-D.

Again, Page moved to put out the fire. He says a new study soon to be published will show that "none of Dr. Garry's findings were significant." He adds: "Dr. Garry himself will not defend that study."

But Garry says that although 2,4-D performs well in the lab, it is a different story in the field.

"In my experience, when you take pure 2,4-D, you never see anything. It's almost biologically inert," he says.

But mix 2,4-D with the other ingredients used to formulate about 1,500 types of 2,4-D weedkiller now on the market, and the story changes. Commercial-grade 2,4-D, he says, is mixed with "adjuvants, things that are going to aid penetration. When you move to commercial grade of the product, then you begin to see stuff."

For example, people who regularly spray the herbicide "have a higher level of 2,4-D in their urine than any other group," he says. They also show more frequent chromosomal changes than people not in contact with 2,4-D, he says.

In 1997, with the EPA review of 2,4-D still underway, the agency's Carcinogenicity Peer Review Committee stopped short of ranking the chemical a probable cause of cancer, like cigarettes. But three years later, one of its own statisticians and one of Garry's collaborators in the Minnesota study linked many cancers--of the esophagus, stomach, rectum, throat, pancreas, larynx, prostate, kidney and brain--to heavy wheat growing regions notable for 2,4-D use.

"We don't know what's causing it," says Dina Schreinemachers, the EPA statistician. "It's something associated with the wheat."

By 1991, homeowners were worried. Buffalo, N.Y., was the first city to require lawn care companies to post warning signs on chemically treated lawns. In that state, according to Audrey Thier of the Buffalo-based lobby Environmental Advocates, five counties have passed ordinances that require prior notice of spraying to neighbors, and eight municipalities have passed ordinances that phase out use of pesticides on government property.

At last reckoning by the General Accounting Office, 23 other states also had counties with some sort of notification requirements.

Also in 1991, the municipal council of Hudson, Canada, banned the cosmetic use of pesticides altogether. A coalition of lawn care companies, including ChemLawn, sued to overturn the ban. Last June, the Supreme Court of Canada upheld the Hudson ban.

Since then, says Angela Rickman, deputy director of the Sierra Club of Canada, "more than 40 different communities are looking at pesticide restriction bylaws of one form or another" in her country. The club declared May 11 "Dandelion Day" and is sponsoring "Getting Your Lawn Off Drugs" workshops this summer at Ottawa City Hall.

Officials Concerned About Effect on Wildlife

When Seattle began a pesticide reduction program in 1999, the concern was for wildlife, particularly Washington state's salmon population. Extoxnet, a pesticide Web site managed by five universities, including UC Davis, lists 2,4-D as severely impairing honeybees at moderate doses, being "slightly toxic to wildfowl and slightly to moderately toxic to birds," and "highly toxic to fish."

"Residential streets are the worst possible place for pesticides," says Phil Renfrow, pesticide reduction coordinator for the Seattle Parks Department. "There is a lawn, a sidewalk and gutter and a catch basin all within a couple feet of each other. The entry into the water supply is right there."

The U.S. Geological Survey confirms that 2,4-D is routinely found in urban watersheds. In the latest round of testing of the Santa Ana River near Imperial Highway from January 1999 to April 2000, 2,4-D was detected in more than a fourth of the samples.

In Seattle, 2,4-D is no longer used on park lawns. "We just accept dandelions and English daisies," says Renfrow, the pesticide reduction official for parks there. Renfrow's department even buys a new "Eco-Turf" seed mix that comes already studded with weeds.

Diana Balmori, a Yale University lecturer in landscape architecture and co-author of "Redesigning the American Lawn," says Connecticut towns are now handing out prizes to keepers of "freedom" lawns--that is, pesticide-free and growing wild.

At UC Davis, weed scientist Tom Lanini gives this advice: "Dandelions are situated in such a way that they never sit across your whole lawn," he says. "For the few dandelions that people have, it's easier than spraying to go out with a dandelion fork and pull them out."

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John Jackson of The Times library assisted with this report.

