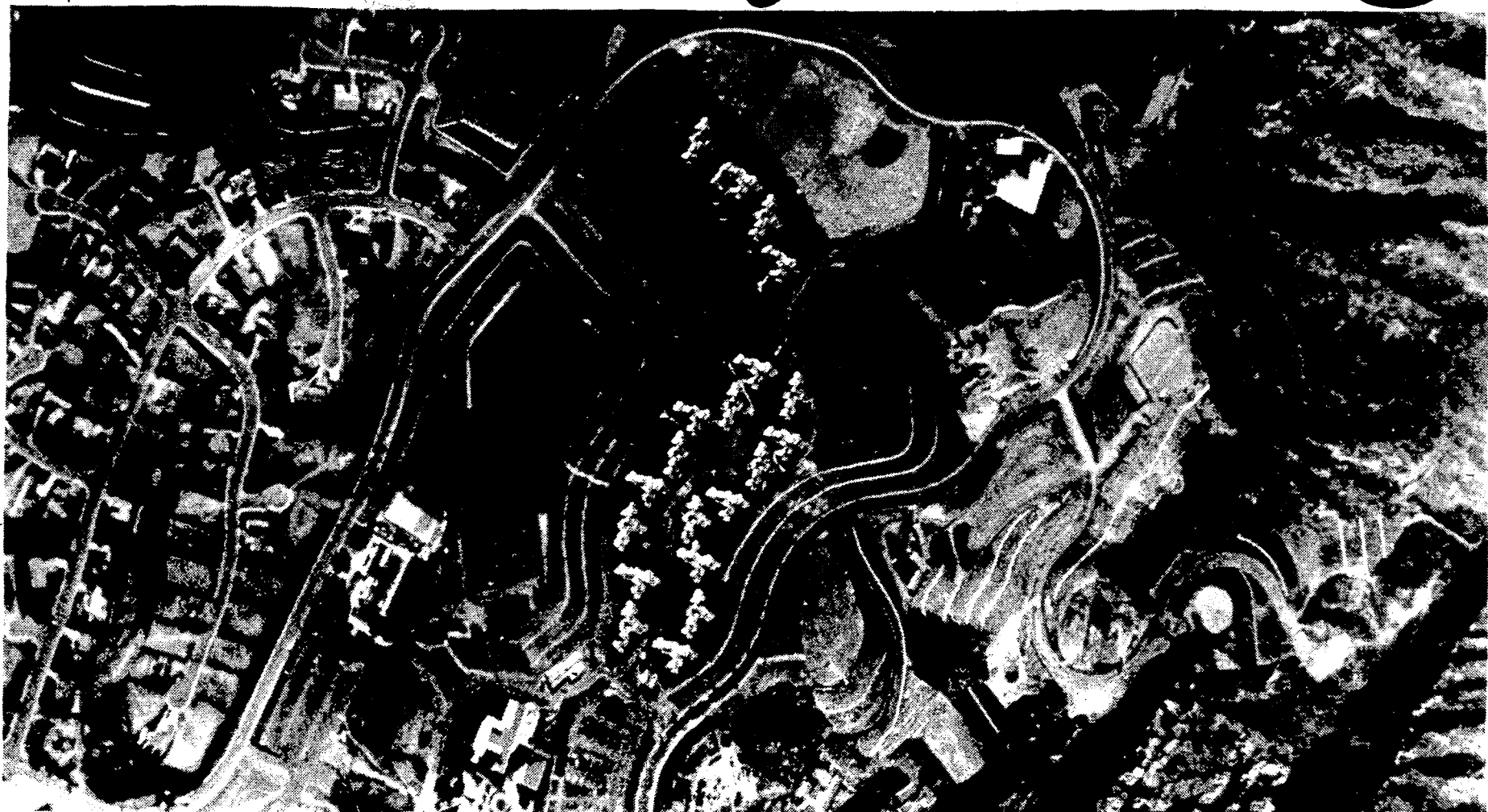


Death by Smog



Farming patterns in Southern California have changed drastically because of smog damage. People have given up growing more than 20 different crops that have proven susceptible.

Jane Melnick

Though city air may be getting clearer, smog damage to vegetation has been increasing. It will cost millions of dollars in lost food production next year.

By Peter Wiley
Pacific News Service

BAKERSFIELD, CALIF.—Drought may have cost the nation as much as \$8-10 billion worth of food this year, but the long-range impact of another crop killer—smog—may be even more devastating.

According to U.S. Department of Agriculture plant physiologist Walter Heck, national estimates of smog damage to vegetation now range from \$150 million to \$1 billion a year. The California Air Resources Board (CARB) reports that smog damage in this state alone will cost consumers \$55 million this year.

Those dollar costs are low compared to estimates for drought damage—\$2 billion in California alone. But droughts come and go, while smog damage has been increasing dramatically from year to year despite air pollution controls.

Some monitors now show cleaner air in major cities but higher concentrations of pollutants miles downwind. "The air may be better in the cities, but vegetation is telling us something different," says California air pollution specialist Sydney Thornton.

"The pollution level is increasing and the picture looks even grimmer if there is a rise in the use of high-sulfur fuels," Thornton, the author of the recent CARB report, said.

Farming patterns in California's South Coast Air Basin, which includes Los Angeles and Riverside counties, have already changed drastically because of smog damage. Farmers have given up trying to grow 20 different crops—from spinach to grapes—that have proven susceptible to pollution.

With California producing some 10 percent of the nation's fruit and vegetables, long-range crop damage here will have significant national impact.

Heck, head of a federal pollution research team at North California State University, says smog damage has been reported "throughout the eastern U.S. and is especially severe from North Carolina to

Boston due to the large number of cities."

In previous years eastern cotton, potato and tobacco crops have been significantly damaged by smog.

Heck spoke of one frightening incident in Paducah, Ky., where freak meteorological conditions brought the smoke from a Tennessee Valley Authority power plant down on nearby soybean and tobacco crops for three hours. Despite the limited exposure, crop yields were reduced from 10 to 20 percent.

Wide variety of sources.

According to Thornton, sulfur dioxide and ozone concentrations are the major pollutants responsible for the damage. These concentrations come from a wide variety of sources, including auto emissions, oil fields, power plants, fertilizer manufacturing, spray cans and home heating.

In California's San Joaquin Valley, one of the richest food-producing areas in the world, smog damage is concentrated at the southern end of the valley, near Bakersfield. U.S. Forest Service reports indicate the largest sources are the rapidly growing valley cities of Fresno and Bakersfield. San Francisco and Los Angeles also may be leaking pollution into the area.

"We suspect that at least part of the problem comes from increased activity in the oil fields in the Bakersfield area," says Thornton.

Getty Oil Co., a major producer in the Kern River field east of Bakersfield, is also monitoring pollutants. Getty's environmental specialist, Fred Hagist, denies that sulfur dioxide caused by oil field operations is a major factor in crop damage.

Hagist's claims are echoed by the Western Oil and Gas Association (WOGA), representing the oil industry in six western states. WOGA is challenging CARB's present sulfur dioxide standard in a court case.

WOGA assistant general manager Robert Harrison says that protection of plants and humans does not require the strict standards set by CARB.

Grim reminders.

While the conflict continues between environmental protection and the fuel needs of the economy, there are grim reminders of what prolonged failure to solve the problem would mean.

In the Cucamonga area, east and downwind of Los Angeles, only dead stumps remain where grape vineyards once stretched for miles. And in the San Ber-

nadino Mountains—a major recreational area along the northern edge of the smog corridor running from L.A. to Palm Springs—one million ponderosa and Jeffrey pines have been hit by smog disease.

"If these forests were being managed for timber rather than recreation, this mortality rate of 3.5 percent exceeds what would be removed for lumber," reports CARB.

In the East, Heck cites an increase in the acidity of rain. He points to auto emissions, smelters and power plants using high sulfur coal as major sources. But, he emphasizes, "the basic problem with this kind of research is that we end up hypothesizing without data because no one has an adequate funding base to do long-term studies."

Data is even more inconclusive about the possibility of pollutants entering the food chain and endangering human health. Most scientists have traditionally argued that heavy elements like lead and cadmium, while easily absorbed by the human body, could not be absorbed by plants and could be washed off produce.

A recent Ministry of Environment Study in Ontario, Canada, however, found very high lead concentrates in soil, vegetation and human blood in areas around smelters. The study prompted Canadian scientists for the first time to warn against the dangers of eating food grown in high-pollution areas.

Thus far researchers in California have focused on the dangers from pollutant contamination, particularly from lead and cadmium, in urban gardens and adjacent to heavily traveled streets.

Laws for people, not plants.

While no clear link has been established between crop damage and damage to humans, most researchers agree that any increase in lead in the food chain would be an unacceptable risk, especially to women and children.

The irony, as Thornton points out, is that present laws setting acceptable smog levels are designed to protect people rather than vegetation. And while such laws aim at major pollutants such as sulfur dioxide, a combination of pollutants, each separately present at supposedly safe levels, is damaging crops.

"We need stricter standards to protect plants," Thornton concludes.

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