

## THE PESTICIDE DDT

In 1939 Paul Muller, a Swiss chemist working for J. R. Geigy, was looking for a way to protect woolens against moths. His quest led him to a white crystalline powder called dichlorodiphenyltrichloroethane that had a devastating effect on flies. The powder, subsequently known as DDT, would become the first modern synthetic pesticide and earn Muller the 1948 Nobel Prize for chemistry. In 1942 Geigy sent some of the powder to its New York office. Victor Froelicher, a Geigy chemist in the New York office, translated the document describing the powder and its amazing attributes into English and gave a sample of the powder to the Department of Agriculture.

The U. S. Army had tasked the Department of Agriculture with finding a way to protect its soldiers from insect-borne diseases. In some of the military units, up to 80 percent of the soldiers were out sick with malaria. After testing thousands of compounds, the department's research station in Orlando, Florida, found DDT to be most effective. It was subsequently used by the armed forces in Europe and Asia to battle typhus, malaria, and other diseases that held the potential to devastate the Allied fighting forces. It proved extremely effective and is credited with shortening the war.

At that time malaria was common in Asia, the Caribbean, Europe, and the southern part of the United States. Millions of people died from malaria each year. With the effectiveness of the pesticide proven in the war years, DDT became the insecticide of choice around the world. It was effective on a wide range of insect pests, it did not break down rapidly so it did not have to be reapplied often, and it was not water soluble and thus was not washed off when it rained. Farmers and homeowners used DDT to protect crops and kill nuisance insects and pests that spread disease. Countries used it to protect their populations. In 1931–32 more than 22,000 people died from malaria in South Africa's KwaZulu-Natal province. By 1973 the deaths had dropped to 331 for the whole country, and by 1977 there was only one death from malaria in South Africa.

Chemical manufacturers were turning out DDT in record volumes. Montrose Chemical Corporation in Montrose, California, was one of the largest, beginning production in 1942. However, clouds had been building on the horizon. In 1962 Rachel Carson published a book entitled *Silent Spring* that exposed a link between the mass use of DDT and the death of birds and fish. DDT was found to be toxic to fish and indirectly toxic to birds due to its persistence in the environment. It tended to accumulate in fatty tissue, and it became more concentrated as it moved up the food chain. Birds of prey started failing to reproduce because their eggshells became so thin they could not survive the incubation period. DDT began showing up in human breast milk. Some sources claimed DDT causes cancer, but the experts disagree regarding that claim. Concern about the effects of DDT grew until the Environmental Protection Agency banned its use in the United States at the end of 1972, 10 years after the publication of *Silent Spring*. However, DDT could still be produced and sold abroad. Montrose continued to export DDT to Africa, India, and other countries until 1982. DDT was banned in Cuba in 1970, in Poland in 1976, in Canada and Chile in 1985, and in Korea, Liechtenstein, and Switzerland in 1986. The product has also been banned in the European Union, Mexico, Panama, Sri Lanka, Sweden, and Togo, among other countries. The persistence of the chemical is evidenced by traces of it still found in the Great Lakes 30 years after application stopped.

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