

CONSERVATION

Pesticides—Friend and Foe

Wide-scale use of pesticides to control insect damage also has a harmful effect on fish and wildlife. Better control methods are needed, Vincent Marteka reports.

See Front Cover

➤ PESTICIDES, the same beneficial chemicals used to spray farm crops, shade trees and mosquito-infested swamps, are also poisoning birds, fish and other wildlife.

The increasing use of highly toxic pesticides during the last 15 years has reduced the number of robins and other song birds in some states while killing off many fish in other states. Birds traveling along their migratory routes are also picking up dangerous amounts of insecticides from eating poisoned insects.

Scientists in various fields have recently banded together in an effort to work out a solution.

Since World War II when DDT was first developed, new pesticides, many not thoroughly tested, have flooded the market. More than one billion pounds of pesticides were produced in 1960. The value of pesticides sold in 1975 is expected to top \$2 billion.

In the United States alone, nearly 100,000,000 acres of forests, fields and swamps were treated with pesticides in 1958.

The big battle against insects began long before man arrived armed with his chemical sprays. During the course of evolution, plants developed defense mechanisms against the insects and the diseases they carry. Birds also played a large role in keeping down the hordes of insects.

When the first white man came to North America, the Indians were living in a relatively stable environment. Although the white man did not fully escape the attacks from insects, enough land seemingly was available for both insects and farmers.

Upset Nature's Balance

As pioneer farmers cleared the forests and planted crops, they unknowingly upset nature's balance, and uprooted forest pests turned to the farmers' fields and multiplied. As urban populations increased and a more discriminating public wanted higher quality food, better methods had to be found to protect crops from pest destruction.

Earlier methods of natural or "biological control" gave way to chemical control, reaching a peak during World War II with the development of DDT.

Scientists have determined that insecticides are more dangerous than any other type of pesticide, where wildlife is concerned. Extensive spraying with highly toxic insecticides succeeds in ridding the forests and fields of insects. But these same poisoned insects, a major source of food for many kinds of wildlife, also frequently kill the creatures who eat them.

The newer insecticides are divided into

two groups: the chlorinated hydrocarbons and the organic phosphates. The first group includes the well-known DDT, and heptachlor, dieldrin and endrin. These highly toxic pesticides kill many different kinds of insects and other forms of life. The chlorinated hydrocarbons remain poisonous for considerable lengths of time.

The organic phosphates, closely related to the infamous "war gases," also contain some chemicals harmful to wildlife, but they generally lose their strength quickly. Malathion, a typical organic phosphate, is used to spray pine woods by plane in California as seen on the cover of this week's SCIENCE NEWS LETTER.

The most heavily sprayed areas in the United States are probably the northern forests and the agricultural lands in the South. Outbreaks of tree-destroying gypsy moths and spruce budworms have kept sprayers busy in the North, whereas the fire ant, imported into the country nearly 40 years ago, has now spread over 20,000,000 acres in the South.

Control programs against Dutch elm disease and mosquitoes are also conducted on a fairly large scale in many parts of the nation.

Effects of Pesticides Vary

Wildlife studies show that the effects of pesticides vary with each animal. U. S. Fish and Wildlife expert, Dr. John L. George, said that fish and other water-loving animals are generally more sensitive to pesticides than birds and mammals. Nine out of ten young Atlantic salmon were recently killed in the Canadian Miramichi River after a nearby forest was drenched with pesticides.

At the U. S. Fish and Wildlife Patuxent Research Center, Laurel, Md., birds fed heavy dosages of chlorinated hydrocarbons were seen running around in circles shaking and losing all sense of balance. Some soon died.

The insecticides attack the nervous system, causing the animal to lose all muscular control. If enough poison is absorbed, death follows.

Although large animal kills are frequent and spectacular, scientists are now more concerned with the chronic or lingering effects of the new pesticides. Waterfowl and other migratory birds, hatched and raised in the North far from areas sprayed with pesticides, have been discovered carrying pesticides in their tissues.

Heptachlor was found in a woodcock six months after the game bird left his heavily-sprayed winter home in southern United States. Other cases of crippled young,

higher mortality rates, and fewer offspring have also been reported.

The accumulation of poisons in wild creatures is only one facet of a very complex problem. Many insects are showing a growing resistance to the chemical sprays, whereas the usefulness of spraying diseased elms is now being questioned in some quarters.

Yet, pesticides play an important role in providing the nation's food supply and protecting the public health. The world-wide use of DDT alone has literally spared millions of lives while hundreds of millions have escaped diseases without one known human case of serious poisoning.

The National Academy of Sciences-National Research Council, realizing the controversial nature of the problem, has created a special committee to work out a sound program for effective plant protection without causing permanent damage to useful animals. An international committee of European and American scientists has also been organized to attack the problem afflicting both sides of the Atlantic.

Better Control Methods Needed

Possible avenues of research include developing better control methods and more select poisons that would kill the pest without harming other creatures. One such new chemical, sevin, may soon replace DDT, which has hit hard at the animal world.

The public must also be instructed in properly applying pesticides and warned of the dangers of misuse. Many farmers and householders indiscriminately spray the new potent chemicals with little thought to the harmful effect on wildlife caused by the build-up of poisons in the soil, or to the possible poisoning of the animal's drinking water.

The public should be taught to avoid spraying near water and using too much poison. Whenever possible, chemicals should not be applied during nesting season, experts advise.

• Science News Letter, 80:178 September 9, 1961

NUTRITION

Food From Groundnuts Developed in India

➤ SCIENTISTS IN INDIA have developed two new food products using native groundnuts, similar to the American peanut, the National Science Foundation reports.

In the first, an enriched macaroni was made from a blend of groundnut flour, tapioca flour, medium-grade wheat particles (semolina) and casein, a protein produced from curdled milk. The macaroni has a protein content of 16% to 19%.

In the second, a dried milk substitute was made from groundnut milk and soybeans. The work was done at the Central Food Technology Research Institute at Mysore.

• Science News Letter, 80:178 September 9, 1961