

## ENTOMOLOGY

# Man Fights Swarming Insects

**Insects suddenly appear in vast numbers, like desert locusts devastating green fields, or delicate mayflies spending their few hours of life dancing above an evening lake.**

By **BARBARA TUFTY**

► **THE BLACK CLOUDS** of desert locusts threatening crops in Asia and Africa after a two-year lull may be doomed to destruction by modern equipment and alerted detection crews from various countries.

Standard treatments of spraying with chemical insecticides, Dieldrin and aldrin, will be used against the three big swarms recently reported in West Pakistan and one in Somalia by the United Nation's Food and Agriculture Organization (FAO).

Concerted efforts of foreign countries in the path of these destructive insects have used U.S. aid and materials to break the cycle of the locust swarms in the past few years, said Leo Iverson of plant pest control, U.S. Department of Agriculture. The locusts have not swarmed for the past two years, the longest lull in 30 years.

## Green Grasshoppers

Locusts are actually grasshoppers, members of the Orthoptera order. They are called grasshoppers during the life stage when they are solitary individuals, green or brown in color, preferring to spend most of the day basking in the sun or resting in the grass. But when these same insects become crowded and the climate favorable, they become restless, turn black and orange in color, and begin to hop, crawl or fly in bands or swarms of billions of individuals. The full grown locust has a wing span of four inches and a body about two and a half inches long and as thick as a man's thumb.

These are the pests that for centuries have invaded areas from Assam to northwest Africa, including Madeira and the Canary Islands, from southern Russia and Turkey to southern Africa. During a life span of six months, a locust can fly over 2,000 miles, laying eggs and devouring every green blade of grass or leaf or other vegetation along the way. Even when they land on something they cannot eat, the weight of their countless bodies breaks and destroys branches, bushes and fences.

Swarms generally follow the rains, pointed out Mr. Iverson, as the locusts evade excessively hot, dry and cold areas. A combination of weather situations with enough warmth and moisture to provide ample vegetation may increase the population to such a point that grasshoppers start to "change" and locusts to swarm, he said. There are two particular breeding areas—one around Eastern Iran and Pakistan and the other around the Red Sea coast, Ethiopia and Sudan—where wind currents generally concentrate masses of these insects and start them swarming.

Locust plagues have been disastrous for centuries. Some 3,500 years ago, Moses warned Pharaoh of Egypt that the Lord would bring down a plague of locusts unless he permitted the Children of Israel to go to the promised land. After the flight of the locusts, says the Tenth Chapter of Exodus, "there remained not any green thing in the trees, or in the herbs of the fields." In 1881, locusts were so prolific in Cyprus that the people destroyed 1,300 tons of egg cases.

## Ancient Defense Methods

Ancient methods of defense included gestures such as beating on drums, waving cloths and burning brush. This did little more than disturb the insects, which merely hopped to other plants.

Men had really found no adequate means of fighting the locust or of preparing themselves for the massive insect invasions until after World War II. About 1945, poisoned baits were set to lure and kill the teeming, hopping hordes. Later, much more successful control methods were devised whereby instruments were mounted on trucks or airplanes to spray the insects with poisons from above as they fly, or to spray the vegetation just before the swarms arrive.

In 1951, 13 countries from the locust-infested areas of the Middle East, northern Africa, and Pakistan met in conference and decided to join efforts in alerting one an-

other. The United States, one of the most spectacular migrating swarms of this type of insect occurred in the 1870's, when the Rocky Mountain locusts descended over the verdant fields of the Great Plains and left them as barren as if they had been burned over. Only holes in the ground showed where the plants had once been, and trees were stripped bare of leaves and green bark. One report from Nebraska estimated that the column of flying insects was nearly a mile high, moving at the rate of about five miles an hour for six hours. Over 124 billion locusts were calculated to be on the move in that one swarming dark cloud. Today this locust has all but disappeared and there remain only a few museum specimens.

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## Pesty Crickets

Mormon crickets in the western United States were other pests causing extensive damage, explained Mr. Iverson. By careful spraying and eradication of the insects, which had been left behind in the initial breeding centers, populations of these pests



FAO

**BEWARE THE LOCUST**—Billions of desert locusts begin to swarm and start on a flight that can blanket up to 100 square miles. A swarm can destroy from 30,000 to 100,000 tons of vegetation in a single day.

have been reduced to manageable proportions.

Another pest to cause periodic damage is the 17-year "locust", which, however, is not a member of the locust family at all but is a cicada and belongs with a different order of insects, the Homoptera. These creatures spend much of their strange life in the soil as wingless nymphs, having hatched from eggs tucked in twigs of forest and fruit trees. For 17 long years they live underground, sucking juices from roots, then dig their way out of the soil into the daylight, climb up the bark of a tree or stick, and emerge with transparent wings and loud, resonant voices. These adult cicadas live for only a few weeks, during which time they lay their eggs and then disappear.

No one really knows how many insects inhabit our earth or what astronomical numbers they reach during the full tide of their fluctuating populations. Almost a million different sorts of insects have been described and named—at least five-sixths of the species of animals in the world. This means they number almost 85% of all living creatures.

### Body Shapes

Insects, those creatures that are "sected" or divided into three parts and have six legs, are the most successful creatures alive today. They inhabited the earth long before man appeared, about 350 million years ago in the middle Devonian period. Most versatile of any other animal, they have adapted themselves through the eons to live in extremes of temperatures on land, water and air, existing on any kind of food. Through millions of years they have developed a great variety of highly efficient body shapes, and have a reproductive capacity that is truly formidable. In one summer season, from April to August for instance, a pair of house flies could give birth to 191 billion billion descendants. Fortunately many factors take their toll of these offspring when they are very young—birds, animals or other insects are always hungry for them. They may fall prey to diseases or fungus, get caught in the spray of an insecticide, or drown in a pool of a raindrop. Another fertile breeder is the aphid or plant lice, which can produce many generations in one season. Between April and October, one female cabbage aphid could produce 1.5 million billion billion descendants if she were lucky.

Not all kinds of insects are so prolific however. Some have only one family each year, some have very few young and some take years to grow from an egg to an adult.

### Causes of Swarms

Swarms or sudden population explosions occur with insects in many different ways. No one knows exactly what causes these spurts and surges of large numbers of insects that can lay waste to man's careful crops and forests. When certain clement conditions of warm weather and rain increase vegetation supply, an enormous population of thousands of millions of individuals can build up to swarm over the sidewalks and roads, destroy mile after mile of grain fields and tumble into houses and subways and habitations thousands of miles from where they started.

Not all swarms of insects are harmful. As winter begins to blow over California and other western states, the lady beetles or ladybirds migrate to the mountains and seek shelter in large masses under rocks and fallen tree trunks. Two men working together can sometimes collect from 50 to 100 pounds of beetles in a day—about two million beetles, to be released later in cultivated fields where they will attack insect pests feeding on crops.

### Gentle Mayflies

On a summer evening, clouds of mayflies suddenly seem to rise and dance in great clouds over a stream or lake shore in a nuptial flight that lasts only a few hours. These swarms are mostly made up of thousands of males flying upward on tiny fragile triangular wings, which then fall in repetitious cycles until a female appears. She is immediately seized by a male and the two of them leave in a soaring dancing course to seek a less crowded spot.

The Monarch butterflies assemble by the thousands at night to migrate south each fall. In the spring, they leave the tropical or warm countries to fly northward, the females laying eggs as they go. These eggs hatch and the northward flight into Canada is continued. Another famous migrant is the Painted Lady which crosses the Mediterranean from Africa each spring—there is no return flight. Swarms forty miles wide with about three billion individuals have passed through Portachula Pass in Venezuela. The calico moth, the death's head sphinx and other moths migrate north to Europe from Africa each year, while the owl moth flies into the cool Himalaya mountains each year from India.

• Science News Letter, 87:90 February 6, 1965

### TECHNOLOGY

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• Science News Letter, 87:91 February 6, 1965

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