

solve this situation by releasing greater numbers of them over a wider area. This means that a lady bug flying out of one garden would be replaced by another lady bug flying in from the neighbor's.

Researchers also plan to set plagues upon harmful insects. Already milky disease spores can be bought at garden supply stores to infest and destroy the grubs of young Japanese beetles.

USDA researchers are trying to produce these disease spores in the vast quantities needed to exterminate the Japanese beetles completely.

Diseases for Insects Only

Low-flying airplanes are spreading a special chemical disease, *Bacillus thuringiensis*, over areas infected with gypsy moths. With the first mouthful the insects stop chewing, for the disease paralyzes their jaws, and soon they shrivel and drop from the leaves. The *Bacillus* disease produces a crystal which is toxic to the caterpillars of the gypsy moths, cabbage moths and many other moths—yet it is harmless to man and other animals.

Airplanes are also spraying a hormone on certain forest insects that can prevent caterpillars from reaching maturity. The wormlike larvae may grow larger and larger until they pop, but will never reach sexual maturity and lay eggs.

Several viruses can kill sawflies on forest trees, cabbage loopers on cabbage leaves, and other pests. These viruses leave no residue on the plants and are not toxic to man. The virus is obtained by grinding up infected caterpillars, mixing the resulting mash with a solution and spraying it over the land. Only five to ten infected caterpillars are necessary per acre, and the application need be repeated only once each season.

Upsetting the living conditions of insects by starving them or taking away their homes is a promising method of getting rid of them. Wheat can be grown resistant to the ravages of the Hessian fly. Corn varieties can be grown resistant to the European corn borer, the corn earworm and other corn-loving insects.

By cutting and plowing under the tobacco stalks after the leaves have been picked, farmers can destroy the housing in which tobacco hornworms live through the winter, ready to attack the young tobacco shoots in the spring.

New Insect Poisons

New insect poisons are used in cooperation with the different attacks on insects. Chemical poisons can be spread in the soil where they are absorbed by plant roots and spread throughout the plant where they kill insects feeding upon the plants. This year three new chemical poisons will be on the market, combining a high level of safety for humans with an increased effectiveness against insect pests.

The all-out war using sterilization methods, disease, predators or poisons must be waged against the insects when they are the most vulnerable. Careful studies of the enemies' weak points reveal that insects are most susceptible at the time of year when the young are exposed or the population numbers are low.

• Science News Letter, 86:74 August 1, 1964

AGRICULTURE

Green Light Means Stop For Pesty Insects

► FLASHES of green light lasting less than one-thousandth of a second can upset an insect so much that he perishes.

By flashing lights at night on cabbage-worms, entomologists of the U.S. Department of Agriculture Research Service have forced the insects to bypass a certain dormant stage of their life cycle and develop into adults "ahead of schedule."

If insects in their natural environment could be subjected to this interruption of their lives, the entomologists believe they would be so badly out of step with nature that they would perish.

Many insects go through four stages during their life cycle: the egg; the larva, when the insect can be most destructive to crops with its voracious appetite; the pupa or dormant stage, and the adult stage.

The successful stopping of insects' life cycle in the laboratory does not necessarily mean the same method can be used for insects in the field, the researchers pointed out. However, commercial Xenon and mercury lamps could furnish enough illumination, and perhaps mobile lights mounted on airplanes, could eventually control insect population in the field.

Light treatments that alter insect development have little or no effect on plant development, the scientists added. Red light is most effective for altering plant growth, and green light is most effective on insects.

• Science News Letter, 86:75 August 1, 1964

Nature Note

Onions in Egypt

► It is written in the tombs: in the days of the Pharaohs, before the shifting sands of the desert covered the great civilization of ancient Egypt, high among the pleasures of the people was—the onion.

Pictures in tombs portraying laborers eating onions date back over 5,000 years to the First Dynasty. As early as the Third and Fourth Dynasties, in the beginning of the Age of Pyramids (2780 to 2100 B.C.), onions are shown on the banquet tables of great feasts.

Onions were among the offerings to the gods of ancient Egypt; priests are often pictured on the walls of pyramids covering altars with their leaves and roots.

Mummies have frequently been found with onions affixed to the pelvic regions of the body, in the thorax, flattened against the ears, and in front of the collapsed eyes. Flowering onions have been found on the chest, and onions have been found attached to the soles of the feet and along the legs.

One of the most important testimonials to the use of onions as a food in ancient Egypt comes from the Bible, Numbers xi, 5. The Israelites, complaining about their hardships while being led by Moses from Egypt to the land of Canaan, said, "We remember the fish which we did eat in Egypt freely; the cucumbers, and the melons, and the leeks, and the onions . . ."

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