

AGRICULTURE

Spring Brings Science to Garden

New ways to kill weeds, safer chemicals for fighting insects and plant diseases, and methods of sprouting seeds into faster growing plants are among the new achievements.

By ANN CLARKE

► THIS SPRING science has:

New ways to kill weeds in the garden, field and lawn.

Better and safer chemicals to fight insects and plant diseases.

Seeds that sprout into faster-growing and healthier plants.

Thousands of research scientists work the year round to improve agriculture in gardens and on farms. Their advances are transplanted into practice and, like the seeds in spring, come to attention when the trees leaf.

Eggplant, tomato, Jerusalem cherry and Jimson's weed seeds have been transplanted into pepper pods in research to understand the basic substances that affect plant growth. University of Wisconsin plant scientists, Dr. LeRoy Holm and Viji Moosad, want answers to questions of what growth substances are needed in seed development and how similar growth hormones are from one plant to another.

Pepper Becomes "Mother Plant"

Their technique is cutting a "window" in the side of a pepper, removing some of its seeds and inserting those of another plant. The pepper becomes the "mother plant," supplying food and growth hormones, although the transplanted seeds keep their genes from the original parent.

Thus far living tomato and eggplant seeds have been produced, although other seeds have been partially developed. The next step is to learn, biochemically, what growth substances affect the seed's development. With this information scientists may be able to produce such things as better fruits and stronger cotton.

Improved crops come from crossbreeding seeds to develop new varieties and careful selection of healthy seeds to be grown. Seeds that are broken, too small or unripe are discarded because they produce plants susceptible to disease and pests.

Broken seeds can be a source of bacterial or fungal infections for healthy seeds. Seed-borne disease and fungi, even when present only in small quantities with healthy seeds, may affect the plant's growth.

Beyond the seed stage, faster growing, better food-producing plants have been developed with new growth-regulating chemicals. For example, the flowering of pineapple is speeded by application of Omaflora. This chemical, a relative of the hydrazine used to power missiles, provides a means of developing uniform harvests in the fields.

A growth-stimulating hormone, auxin, has been found lacking in small trees. Scientists

have learned that strawberry plant grafts on pea plants transmit a growth-promoting hormone.

In recent years the chemical, CCC (2-chloroethyl trimethyl ammonium chloride), has been used to make plants shorter, stockier and produce greater yields. Widely used on Christmas poinsettias, the chemical has also been tested on wheat, tomatoes and some types of gourds.

Growing to Music?

And, according to a few claims, plants grow better with music to pass the growing days away. A scientist in India who exposed his climbing shrubs to flute music and a corn grower in Iowa have both reported success in increasing plant yields by playing recorded music in the garden. But most horticulturists view the effect of music with great skepticism.

Even after the cold war to develop healthy seeds that combine the good characteristics of more than one variety is won, the gardener or farmer must still protect

his plants from the guerrilla tactics of insects and weeds. An estimated eight billion dollar agricultural loss is expected in 1963 from insects alone.

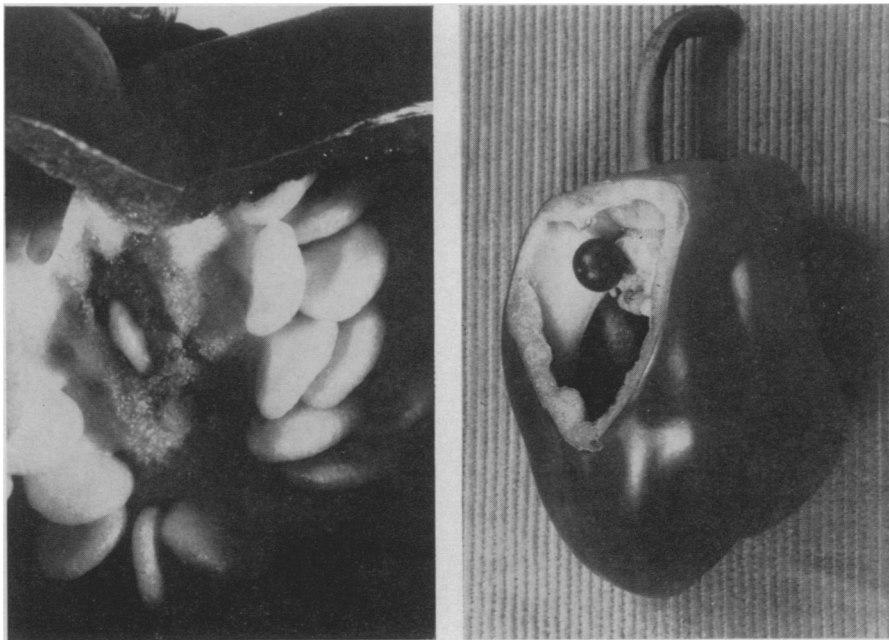
Two Types of Poison

Scientists are exploring methods of fighting insects by high-frequency sounds, sterilization, using chemical attractants with insecticides, and outright poisoning. Insect poisons are chemically of two main types, chlorinated hydrocarbons such as DDT, chlorodane and lindane, and the phosphates, a newer type of insecticide.

While the chlorinated insecticides came into use in 1944-45, the first phosphate, Parathion, was used in 1948. This highly potent insecticide is effective with almost everything grown on a farm. In general insects that have developed a resistance to DDT are less resistant to the phosphates.

A new phosphate insecticide brought onto the market in 1962 is Phosphamidon, a spray used for food crops. Another new insecticide-acaricide (toxic for insects and ticks) is Imidan. It protects crops ranging from citrus fruits to vegetables.

An important chlorinated hydrocarbon in insect campaigns this year is Dieldrin which is being used in an intercontinental locust campaign staged in the Near East and



University of Wisconsin

CHERRY GROWS IN PEPPER—The photograph (left) shows a fertilized ovule of eggplant nearing maturity in the fruit of green pepper. More spectacular, although not any more important scientifically, is the photograph (right) showing the entire green pepper pod with a window placed in the wall to reveal the young fruit of a Jerusalem cherry, grafted 20 days before the picture was taken. The fruit was 20 days old from fertilization when it was grafted to the pepper plant and it increased one-third in volume before being harvested.

Africa. It will also be widely used in Norfolk, Va., to eradicate the white-fringed beetle, a native of South America that attacks all kinds of plant life.

A sex attractant will be used to lure male pink bollworm moths to insecticides or sterilizing chemicals as result of research of U.S. Department of Agriculture tests at Torreon, Mexico. The larvae of this insect feed on cotton bolls. Natural sex lures have been identified for other insects, such as the gypsy moth and the cockroach.

Scientists at the University of Hawaii have learned that plant-attacking insects can be killed, attracted or repulsed by ultrasonic waves. Male mosquitoes can be lured into an electrified screen by a sound imitating the noise of a female mosquito's wings. Flies are repulsed by the sound of a rubber stopper turning in a bottle. A sonic screen of sound resembling the ultrasonic cry of a bat could keep pest moths from attacking orchards.

Research on a Sonic Weapon

Although many of these methods are in the development stage, the research is continuing to develop a sonic weapon that would be specific for insect pests and economical to use.

Every year about a billion and a half

MEDICINE

TB-Like Germ From Fowl

➤ A STRANGE, new drug-resistant germ that causes a tuberculosis-like disease in man may come indirectly from chickens and other fowl.

Scientists at the University of California, Los Angeles, and the Olive View Hospital at Los Angeles, have found a marked similarity among certain bacteria from chickens and a TB-like germ known as the "Battey" strain. Similar bacteria were also isolated from swine.

Conducting the study were Lois A. Scannon and Drs. M. J. Pickett, Seymour Froman and Drake Will.

The "Battey" strain of bacteria causes progressive lung disease in humans but is quite different in many respects from the true tuberculosis germ.

The new germ has been a problem recently in many parts of the world, including the southeastern part of the United States. Drugs that have been effective against tuberculosis bacteria have frequently not been effective against the new germ. One clue pointing to fowl as a source of the new organism is that children given a tuberculin skin test have shown a reaction to the fowl variety of bacteria earlier than to the human variety. This suggests that children have been introduced to the bird germ first, possibly in milk.

The researchers have shown that these bacteria can survive for a long time at high temperature. Thus pasteurization may not always destroy such germs.

The bacteria infecting humans may be a slightly modified version of the fowl and swine forms, the UCLA investigators said.

Infection of humans would not likely be

acres in the U.S. are treated in some degree with weed-killing chemicals. They are used in 33 million U.S. family gardens. On the farms the average yearly loss of crops due to weeds is estimated at about five billion dollars, while millions are spent in suburbia on weed-killers.

New chemicals on the market for this year's crop include:

Dichlobenil, effective for Spanish needles, ragweed, tearthumb, several grasses and other weeds in cranberry bogs.

Eptam, Stauffer R-1607, Tillam and Casoron for marigolds and petunias. These insecticides are effective against yellow foxtail, tumbleweed, lambsquarter, winter cress, Pennsylvania smartweed and hairy crabgrass.

Atrazine for quackgrass control in cornfields.

Monobor-Chlorate-Granular, a water-soluble compound, effective against Johnson grass and Dallis grass.

Titrac, a liquid herbicide for economical control of deep-rooted weeds, MCPB for 95% effective removal of Canada thistle in pea crops.

In addition to weed control among crops, herbicides are being used to clear waterways of clogging weeds and roadsides of fire-causing brush and undergrowth.

• Science News Letter, 83:170 March 16, 1963

MEDICINE

Heart Damaging Virus Fatal to Newborn Infants

➤ A VIRUS fatal to newborns because of the severe damage it inflicts upon their heart muscles may be taking many more infant lives than medical men now realize.

Dr. J. Neal Middelkamp, pediatrician at Washington University Medical School, St. Louis, reported that the virus, Coxsackie B, has been pinned down as an infant killer only in the last few years. As a result, the perils of this virus may not yet be generally recognized by medical authorities and it may escape detection even at autopsy.

Only some 40 to 50 infant deaths have been attributed the world over to the Coxsackie B since its lethal capacity was first observed ten years ago. Six of the deaths were recorded at the St. Louis Children's Hospital where Dr. Middelkamp isolated the virus from the diseased hearts following autopsies.

With more and more Coxsackie B data beginning to find its way into the medical literature and knowledge of the disease increasing, death among infants may turn out to be more prevalent than it now seems, Dr. Middelkamp said.

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ENTOMOLOGY

Tiny Wasp Battles Major Citrus Pest

➤ ONE OF FLORIDA'S most destructive citrus pests is losing its battle for existence to a tiny gnat-like wasp.

The parasitic wasp, imported from Israel, is "becoming an important factor in the biological control of Florida red scale," reports Dr. Martin H. Muma, University of Florida entomologist. In Israel the insect effectively controlled the same insect pest in two to three years.

The scale-fighting wasp was introduced in Florida in 1960. It has spread from central Florida to the east and west coast areas and as far south as Miami. The high winds of hurricane "Donna" are thought to have increased the spread of the insect.

The wasp parasite, *Aphytis holoxanthus*, was imported into Israel from Hong Kong. U. S. breeding stock of the wasp came directly from Israel.

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AGRICULTURE

Grapes to Be Harvested By Special Machine

➤ BACCHUS and a few connoisseurs may rebel, but the machine age is even taking over one of man's ancient sources of pleasure—the grape.

After five years of research and experimental efforts, scientists at Cornell University have come up with a complicated machine that will do the work of 25 people in harvesting grapes. Now in the last stages of remodeling, this device successfully removes more than 95% of the fruit, Prof. E. Stanley Shepardson, agricultural engineer at the N. Y. State College of Agriculture, reported.

As the machine moves continuously along a row of vines, a vibrating, freely rotating spiked wheel shakes the wire and the grapes drop from the bunches. Grapes must be grown hanging from single wire supports for this harvester. An air blast removes leaves and other debris, and then the grapes are stemmed and pumped to a container for transport to the factory.

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AGRICULTURE

Taste "Juries" Test Ripeness of Fruit

➤ JURIES of people who like fruit are the best taste meters. They are helping scientists devise a ripeness test for peaches, plums and pears which often look ripe before the pleasing taste has developed.

Fruit farmers need to know how ripe the fruit must be in order to be acceptable to consumers and then have a quick way to measure the ripeness. The best means found so far are two old ones, testing of sugar content and softness of fruit. Research on these two at the University of California, Davis, has established a "breaking point" for the fruit, after which it will ripen after picking.

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