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Research in progress

Beneficial microorganisms

Bacteria that stimulate the growth and yield of agricultural crops have been identified and isolated by University of California plant pathologists. In field tests in which the seeds were treated before planting with selected strains of the beneficial bacteria, yields of potatoes were increased by up to 30 percent and yields of sugarbeets by up to 10 percent. The scientists believe similar increases can be obtained in other crops such as wheat, which is now being field-tested after significant bacterial stimulation of growth was recorded in greenhouse trials. The researchers say the beneficial bacteria, species that occur naturally in the soil, probably stimulate growth and yields by biologically controlling pathogenic organisms.

Mosquito control

California mosquito control agencies have reduced their use of chemical insecticides almost 1,000 percent since 1962 by using integrated control strategies developed by University of California research. The statewide research program emphasizes the use of natural enemies of mosquitos such as gambusia fish and insect predators, manipulation of mosquito genetics to induce sterility and other characteristics, and the use of biological

compounds to kill mosquitos without harming other organisms. The research has reduced mosquito-borne encephalitis and malaria infections in California.

Folling insects

Aluminum foil and white plastic mulch in Imperial Valley squash and melon plots causes flying insect pests to get their signals mixed: they keep flying instead of landing to damage the crop and spread virus diseases. In tests by University of California entomologists, it was found that aluminum foil mulch kept 96 percent of green peach aphids, which spread watermelon mosaic disease, out of the test plots for a full season. By thus controlling this scourge of squash and melon growers, yields were increased by 45 percent over untreated plots. Scientists conjecture that the mulches cause the aphids to see reflected ultra violet light instead of the normal blue-green light of plants which would be a signal to land.

Fiber and B12 deficiency

Some fiber in the diet is necessary, but too much of certain kinds may result in depletion of vitamin B12 and create a health hazard, according to research at the University of California. Nutrition scientists have found that high levels of

cellulose and pectin, found in fruits and vegetables, led to progressively and significantly depressed growth and depletion of B-12 when fed to rats. Pectin apparently exerts an additional negative effect on B-12 utilization because it serves as an energy source to intestinal bacteria. The researchers say the consumption of pectin supplements would significantly increase the vitamin B-12 requirements in the diet and could represent a health hazard to persons such as vegetarians and the elderly.

Antifreeze in fish

Antifreeze substances termed glycoproteins (AFGP) found in northern polar fish blood lower the freezing temperature of the blood and keep the fish from freezing to death. Studies by R. E. Feeney at the University of California at Davis, on the structure of the antifreeze substance from the northern polar cod obtained during a 1976 expedition, showed it to be essentially identical to the same AFGP isolated and identified from Antarctic fish. Differences were found, however, which may prove to be of interest from the evolutionary and global distribution standpoint. Shipments of serum from the Norwegian government are aiding in studies to determine how the antifreeze mechanism works.