AGRICULTURE

New Species From Old

Using the atom for creation not destruction, plant types that fit the definition "new species" have been created by Swedish scientists. Sprouting controlled by radiation.

By WATSON and HELEN DAVIS

➤ MAN MAY have already created new plant species out of old, using as a tool for creation his most destructive force, the atom.

More food for a hungry world is the first prospect from this atom-created beneficial mutation, reported to the International Conference on the Peaceful Uses of Atomic Energy in Geneva.

The Swedish scientists L. Ehrenberg, I. Granhall and A. Gustafsson reported plant types that fit the definition of "new species" have been made by atomic bombardment of plants in an experimental garden.

"In one stroke and simultaneously," irradiation from atomic particles changed the hereditary make-up of the plants so much that their offspring showed all the essential characters of a separate species, they said.

Features marking the plants as "new species" are inability to cross-fertilize with their parent stock, drastic changes in shape and structure, altered response to environment, and differences in genetic structure that can be detected under the microscope.

The "invention" of new species comes as part of a world-wide search for new varieties of agricultural plants to feed the hungry mouths of tomorrow, by inducing desirable hereditary mutations with atomic particle bombardment.

From experimental work in Sweden, it has definitely been shown in barley and other test plants that such induced mutations can increase the yield per acre of a variety, or leave the yield unchanged while improving special characteristics of importance in agriculture.

In addition to increased yields, beneficial mutations concerning stiffness of straw, response to fertilization, earliness of fruiting, protein or oil content, fiber strength and grain size all were obtained.

Most agricultural species, even high-bred ones like barley, wheat and corn, are still "rather old-fashioned" in their characteristics, the scientists said, and need to be reconstructed according to the demands of modern agriculture. They believe that irradiation-induced mutations may offer the way to get these changes.

In the past, breeders had to wait patiently for mutations to occur naturally, selecting the occasional variants for breeding experiments in the hope of getting improved varieties. With irradiation exposure, the mutation rate can be raised several thousand times above the natural rate.

This makes it possible to observe and experiment with a greater number of beneficial mutations, and in a much shorter time than has ever been possible before.

At present there is no way of telling what kind of a mutation may result from irradiation exposure, and breeders must still wait for their exposed seeds to sprout to see what changes have occurred. Experiments are now being conducted, the Swedish scientists said, to learn how to influence mutations on a selective basis by varying the kind and amount of irradiation.

Sprouting Inhibited

➤ VEGETABLE CROPS will probably be exposed to atomic radiation on a commercial scale "within the next few years," to improve storage quality and destroy plant pests, a team of U. S. scientists told the conference.

Describing the startling new jobs scientists are finding for atomic radiation in the world's race for more and better food, Drs. A. H. Sparrow of the Brookhaven National Laboratory and J. E. Gunckel of Rutgers University, the State University of New Jersey, said that radiation has already been used successfully to control sprouting in stored potatoes and onions.

"There is every reason to believe that the same technique will prove useful in the inhibition of sprouting of other vegetables," they said.

The scientists also revealed that tests at the Brookhaven Laboratory indicate strong radiation doses may prevent reproduction of the golden nematode, a destructive pest of potatoes.

Super Cabbage Plants

➤ SUPER CABBAGE PLANTS, bigger and better than the kind that nature grows now, will be possible when scientists find a way of using sunlight's energy in a less complex and more efficient way than plants do.

Dr. Arthur H. Snell of the Oak Ridge National Laboratory in Tennessee, no doubt using cabbage symbolically for all of mankind's food and energy, said, "Maybe the average cabbage plant is not making the best use of its daylight hours, and when we have fuller knowledge and more perspective about photosynthesis and related processes, we can show the cabbage plant how it can grow into a super cabbage plant."

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Urea has the highest nitrogen content of all solid *fertilizers*.

• RADIO

Saturday, August 27, 1955, 5:00-5:15 p.m. EDT

"Adventures in Science" with Watson Davis, Director of Science Service, over the CBS Radio Network. Check your local CBS Station.

Dr. E. F. Knipling, chief of the entomology research branch, Agricultural Research Service, U.S. Department of Agriculture, Beltsville, Md., will discuss "The War on Insects."

BIOPHYSICS

Soaking Protects From Radiation Damage

➤ A SIMPLE SOAKING in water offers protection to living tisues against radiation injuries, an American scientist reports in *Nature* (Aug. 13).

To test the effects of increased moisture on X-ray damage, Richard S. Caldecott of the U. S. Department of Agriculture and the University of Minnesota soaked barley seeds in plain water for different lengths of time, then exposed them to X-rays.

He found that soaking seeds for one hour at room temperature, 71.6 degrees Fahrenheit, or for four hours at 32 degrees Fahrenheit, increases the seeds' resistance to X-ray damage. Soaking them for longer periods appeared to reduce this high resistance until the same effect as with dry seeds was obtained by X-ray radiation.

These findings conflict with the current belief that much radiation damage is caused "indirectly" by the decomposition of moisture in living tissue by the X-rays, Mr. Caldecott pointed out. Far from increasing the damage, stepped-up moisture content actually affords protection from X-rays.

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PUBLIC HEALTH

Atomic Self-Protection Will Come Naturally

➤ OUR CHILDREN or grandchildren, growing up in the atomic age, will know well how to protect themselves from the radiation hazards of their daily lives.

They will follow precautions as a matter of habit, because they will have been educated in such matters as the present generation of adults was educated to watch out for trains at railroad crossings.

This picture of increasing future safety from radiation accompanied by increasing production and use of radioactive materials was presented by Sir Ernest Rock Carling, London, England, at the International Conference on the Peaceful Uses of Atomic Energy in Geneva.

Those who work in atomic energy plants and other places using radioactive materials, such as hospitals, must of course learn the "techniques and discipline" necessary to avoid exposure, Sir Ernest said.

The general population also, he suggested, may need to learn the lessons of self-protection. "Inevitably," he said, populations will be exposed to higher peacetime backgrounds of radiation.

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