PLANT PHYSIOLOGY

Plant Hormone Research Is Awarded $1,000 by A.A.A.S.

New Substances Added to Water or Mixed With Lanolin and Rubbed on as Salve Will Develop Roots

SOME DAY you will be able to go to the drugstore and buy a salve that will make plant stems grow roots or your window box or garden develop more luxuriantly.

This promises to be the outcome of the plant hormones research by Drs. P. W. Zimmerman and A. E. Hitchcock which was awarded the $1000 prize of the American Association for the Advancement of Science meeting at St. Louis.

Fifteen new substances which cause striking effects when applied to plants were discovered and experimented with during the past year by Drs. Zimmerman and Hitchcock, working in the greenhouses and laboratories of the Boyce Thompson Institute for Plant Research in Yonkers just outside of New York City.

Roots were made to grow on stems, leaves and even parts of flowers of plants by rubbing on or injecting the plant hormones. This is nearly as startling to botanists as the unfulfilled idea of growing hair on a bald head by some substance.

"New roots appear within three to six days wherever the hormone is administered," said Dr. Zimmerman in an exclusive statement to Science Service.

In Water or Oil

"The plant hormones or growth substances can be used as water solutions injected into the stem or added to the soil. One part in a million parts of water is very effective. The hormones can also be mixed with lanolin or oil and used as a salve. In this case it is applied to the aerial parts of the plant. Where the salve touches a stem or leaf, growth is accelerated and then roots arise within a few days. Propagation can be greatly facilitated by applying the substance a few inches back of a growing tip. When roots start the part is removed and planted as a new seedling."

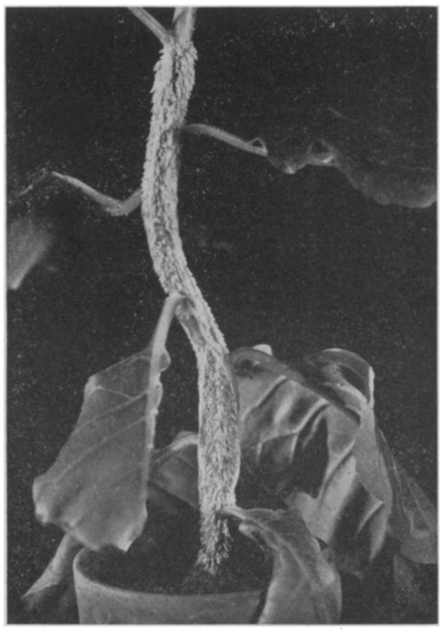
First application of the new prize discoveries will probably be made by nurserymen who will use the hormones to start roots on growing branches which may be cut off and planted as slips.

This is not the first time their researches have been awarded a prize for Drs. Zimmerman and Hitchcock, together with Dr. William Crocker, director of the Boyce Thompson Institute, in 1932 were given the A. Cressy Morrison prize of the New York Academy of Sciences for showing that poisonous gas, carbon monoxide, could initiate and stimulate roots.

Carbon Monoxide

Carbon monoxide was the first pure chemical ever used experimentally to induce roots at unusual places upon plants. Since that time Drs. Zimmerman and Hitchcock have found many other such chemicals. The most effective of these are the following synthetic chemicals made in their laboratory: Naphthalene acetic acid, four indole compounds and phenyl acetic acid. In addition to making these compounds, the scientists extract natural hormones from roots, flowers and ripening fruits.

Growing of what botanists call "adventitious" roots in strange places upon plants is the most spectacular effect of

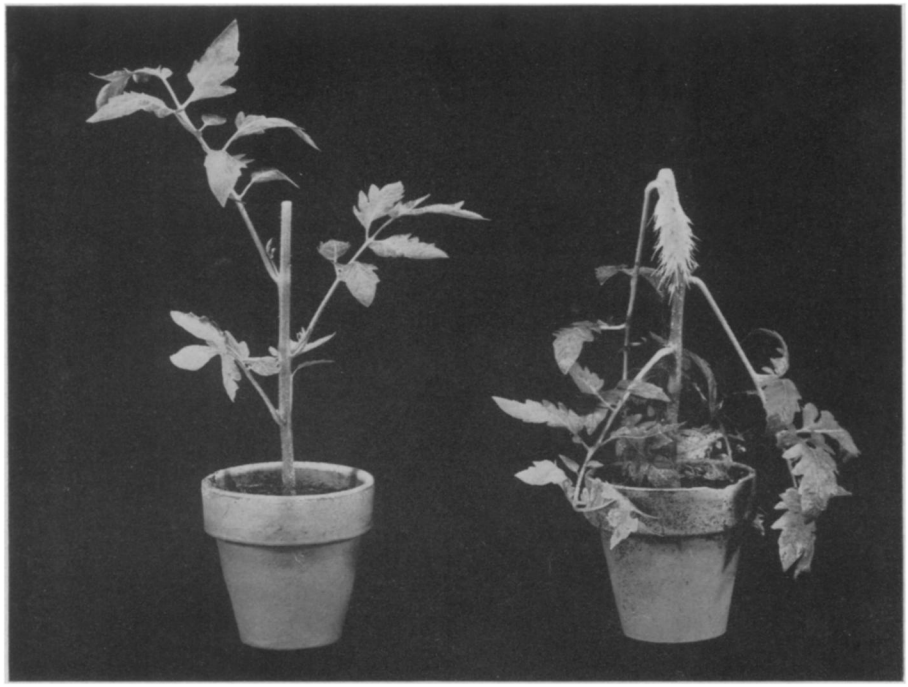


ROOTS APLENTY

Putting 10 milligrams of indolebutyric acid, chemical controlling root production, into the soil around this tobacco plant, produced this root-covered stem in just a few days.

PRIZE WINNERS

Dr. P. W. Zimmerman (left) and Dr. A. E. Hitchcock (right), who were awarded the A.A.A.S. $1,000 prize for their plant growth research at the Boyce Thompson Institute for Plant Research, Yonkers, N. Y.



ROOTS ON STEM

Tomato plant at right had top cut and a half of one per cent. solution of naphthalene acetic acid was applied to the cut surface. This photograph was taken ten days later. Tomato plant at left is control. Top was cut, no chemical was applied and no roots grew.

the plant hormones but it is also possible to make plants curl their stems and leaves, grow more luxuriantly in predetermined spots and proliferate in an unusual manner.

Science News Letter, January 11, 1936

RADIO

Worse Broadcast Reception Forecast for Next Two Years

WORSE radio reception in the broadcast band region of the radio dials is forecast by Dr. Harlan T. Stetson, Harvard scientist, thanks to the increasing spottedness of the sun that will occur in the next two years.

Because the sun is becoming increasingly active as measured by the great solar storms, seen as sunspots, Dr. Stetson was able to announce this unhappy prediction to astronomers of the American Association for the Advancement of Science.

There is every indication that the sun will reach a peak of maximum spottedness earlier than the usual length of the familiar cycle that astronomers have measured carefully for over a hundred years. Dr. Stetson finds that the next greatest time of sun spottedness will be reached in the early part of 1938, only ten years since the last maximum. Now solar activity is well on towards the half-way mark between the last minimum at the end of 1933 and the next maximum.

Wars, epidemics, weather and all sorts of happenings here on earth have been attributed to sun spots by eager investigators in the past but Dr. Stetson has contented himself with discussing the better authenticated correlations that exist between the sun's spots and radio. Along with the generally impaired conditions for radio will come magnetic disturbances, which may affect telegraphic transmission at times.

Only twice during the past century has the interval between maximum peaks of sunspots been as short as ten years. Large groups of spots have appeared on the sun this month.

Science News Letter, January 11, 1936

BOTANY

Plants Act Like Tiny Electric Batteries

GROWING plants act like electric batteries, developing small electric potentials. These are measurable in only a few score millivolts at most. A millivolt is a thousandth of a volt. Ordinary house current is usually 110 volts; an automobile battery develops six volts.

Various aspects of this electrical activity of living things were discussed at the meeting of the American Association for the Advancement of Science in St. Louis by a number of speakers. Dr. E. J. Lund of the University of Texas told of extremely minute measurements of the electric potentials on individual cells which show that there are differences in voltage even between points only a microscopic distance apart. S. O. Brown, also of the University of Texas, told of measuring the potentials on Chara, a common water-weed. He found, among other othings, that merely touching the tip of the plant will call forth electrical changes in it. Another University of Texas investigator, S. S. Wilks, reported on electrical potentials in the first green shoot that comes from a sprouting oat seed.

If the end of a scarlet runner bean stalk is cut off, and the buds farther down thus induced to start growth into branches, there is a decided decrease in the potential of the joints above such buds, W. S. Rehm of Chicago reported. The potential may even be reversed, from negative to positive. Even a mechanical push against a leaf will cause such an electrical change, at least momentarily.

These bioelectrical potentials can be increased by applying an increase in the pressure of oxygen to which they are exposed, Dr. G. Marsh of the State University of Iowa reported. On onion root tips there is an increase of potential with increase of oxygen pressure, up to about 30 atmospheres, but beyond this point a decrease sets in. Similar results were obtained with a frog's skin, but the critical pressure in this case was 63 atmospheres.

Science News Letter, January 11, 1936

Haste is the chief cause of automobile accidents, according to an official of an accident insurance company.

Termites have found their way to St. Helena, and have damaged the wood in Napoleon's residence there.