

PLANT PHYSIOLOGY

Seeds Resist Drought

A Russian botanist reports that he has grown drought-resistant plants from seed subjected to a soaking-drying period. Future generations were also resistant.

SOAK YOUNG wheat seed in water, dry it and the wheat plant that grows will be drought-resistant. Not only will the plant survive a dry spell, successive generations will also be resistant.

Dr. P. A. Henckel, a Russian botanist and a member of the USSR Academy of Sciences, Moscow, told SCIENCE SERVICE that he has increased the drought resistance of several different plants without time-consuming and expensive breeding experiments. All that is required is a single soaking of the seed followed by air drying. No apparatus is needed, D. Henckel said, and the main cost is the labor in handling the seed.

(The results of this work support the controversial theory that environmental influences on the "parent" can be transmitted to the "children." The Russian scientist T. D. Lysenko is one of the most famous proponents of this theory, which is believed to have influenced Russian research. The environment rather than the gene and chromosome, the commonly accepted explanation for inherited characteristics, thus becomes very important. Most of Lysenko's theories and work are at odds with that of Western geneticists.)

Treated wheat seed has already been grown commercially in Bulgaria, China and the Volga River Basin. Under drought conditions, the increase in yield over untreated seed has ranged from 10% to 40%. Some seeds do not respond to the treatment, however. Treated oat seed gave a reduced yield.

The Russian scientist made no attempt to explain how the environment-induced drought resistance persists through several generations. Even though resistance does last, he said, each lot of seed is treated before planting. Sunflowers, oat, barley, millet and tomatoes were among the plants tested.

The wet-dry method of building drought resistance is the result of some 25 years of research, Dr. Henckel said. Russian scientists are also working on similar environmental studies for making plants salt- or heat-resistant.

A seed, which is actually a young plant, is extremely plastic, Dr. Henckel pointed out. Its metabolism and respiration rate are high. The protoplasm, basic life "stuff," of a seed might be described as impressionable. Because of this, Dr. Henckel explained, changes affecting the protoplasm can be found in the mature plant.

"The ability of the plant to be dehydrated is dependent on the elasticity of protoplasm and on the possibility of maintaining synthetic ability during drought," Dr. Henckel said. He reported on results of his research to scientists attending the 9th International Botanical Congress in Montreal, Canada.

Some Western scientists are also working on the inheritance of environmental effects. Prof. G. Krotkov, head of the biology department at Canada's Queen's University, Kingston, pointed out that it had been difficult to repeat Russian experiments. United States researchers have reported

that high temperature effects are transmitted through the pea. Apparently, the high temperature's harmful effects are transmitted through the protoplasm in the plant's pollen. The whole question of such "inheritance" is still a controversial one, however.

PLANTS RESPOND to recorded music with significant growth increases, an Indian scientist told the Botanical Congress.

For a half-hour daily, between five and six o'clock in the evening, native climbing shrubs of the Pothos family "listened" to recorded flute music. They listened every day for 30 days to the piece which was played by a leading Indian flutist, Dr. Stella Ponniah of Tiruchirapalli, India, reported. The same number of plants of "almost the same vigor and height" were grown without the benefit of music as a control for the experiment.

At the end of the experiment, extraordinary increases in plant growth were observed, Dr. Ponniah said. Average height increased by 25%; average number of leaves by 50%; and average length and breadth of leaves by 30% over the plants not exposed to the music. There was also about twice as many roots on the treated plants.

There has been no other work reported, so far as she knows, on plant growth as related to recorded music. During the past eight years, Dr. Ponniah said, researchers in India have been studying the effects of "live" music on the growth of plants.

HEALTHY, strong-looking timber may house an important disease-causing plant.

Some 3,000 mine workers in South Africa came down with sporotrichosis before it was realized that the supposedly sound mine timbers contained mature spores of the fungus *Sporotrichum schenckii*. The fungus causes lesions on the skin and can spread along the lymph channels, internal organs and even the bones, Dr. Rebecca Brown told botanists at the Congress.

Control measures were effective in killing the fungus, said Dr. Brown. She is with the Transvaal Chamber of Mines Timber Research Laboratory in Johannesburg.

Further research showed that in older seasoned wood, the fungus is eliminated by most of the wood-destroying fungi commonly found in mines.

Another case of a fungus causing disease in man was reported by an American researcher.

Sudden outbreaks of an acute respiratory infection—pneumonitis—have been reported among workers wrecking old buildings, Dr. Chester W. Emmons of the National Institutes of Health, Bethesda, Md., said. These have been traced to the microscopic fungus *Cryptococcus neoformans*.

Virulent strains of the fungus were found in the droppings and nests of pigeons that had lived in the attics of the old buildings for many years. Dr. Emmons suggests these strains could be the source for local outbreaks of pneumonitis. He estimates some 50 to 60 deaths—at least—are caused by the fungus each year.

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MICRONUTRITION—The effect of the trace element molybdenum on plant growth is demonstrated by farmer Markus Koch of Sikeston, Mo., with his soybean crop. Some treated plants averaged six to seven inches higher than untreated ones.