Breakthrough in wheat self-fertilization

A major discovery at the Agriculture Canada Research Station in Lethbridge, Alberta, brings world food production a step closer to a type of self-fertilizing spring wheat.

Two scientists at the station – Ruby Larson, a wheat geneticist, and John Neal Jr., a soil microbiologist – have genetically altered a type of spring wheat so that it supports soil bacteria which convert nitrogen from the air into a form the plant can use as nutrient.

The bacterial process, called nitrogen fixation, usually involves bacteria that must live and work in harmony with small root nodules on legume plants such as alfalfa to convert nitrogen from the air into a natural fertilizer.

The scientists found for the first time in significant quantities free-living bacteria capable of nitrogen fixation in soil surrounding the roots of spring wheat.

If lines of wheat could be developed that encourage growth of such bacteria in the surrounding soil, it would have far-reaching implications for nitrogen-hungry cereal crops that depend on chemical fertilizers to meet their needs.

The Lethbridge scientists, who reported their findings in the current issue of the British scientific journal, *Soil Biology and Biochemistry*, stated that they substituted chromosomes from Cadet wheat with a pair of chromosomes from Rescue wheat. Next, they isolated bacteria from soil surrounding the roots of the altered line of spring wheat, grew the bacteria in the laboratory, and tested them for nitrogen-fixing ability.

"We found the substitution line supported nitrogen-fixing bacteria in the soil environment around its roots. The parental varieties, Cadet and Rescue, did not," the researchers say.

"As far as we know, this is the first time free-living nitrogen-fixing bacteria have been found in substantial quantities in the root environments of spring wheat."

The scientific and agricultural excitement comes from the fact that the scientists genetically manipulated their wheat plants to support nitrogen-fixing bacteria. The findings they say, represent "a significant breakthrough".

Whether the bacteria convert enough nitrogen from the air to provide natural fertilizer for the wheat plants is still not known. Drs. Larson and Neal will try to determine if the soil bacteria around their substitution line of spring wheat can supply significant quantities of nitrogen to the plants.

If they can, the next question could be: is enough natural fertilizer being supplied by nitrogen-fixation to boost the nitrogen-dependent protein level in the plant?

Whatever the outcome, the door has finally opened a crack toward long dreamed-of cereal crops that can draw on nitrogen in the air to meet an essential part of their fertilizer diets.

Canada/Soviet fishing pact

Secretary of State for External Affairs Allan J. MacEachen announced on June 1 the conclusion of an agreement between Canada and the Soviet Union on fisheries matters, effective immediately.

The agreement, signed in Moscow on May 19 by the Minister of State for Fisheries, Roméo LeBlanc, and Soviet Fisheries Minister Ishkov, sets out the terms and conditions that will govern continued fishing by Soviet fishing vessels in areas to be brought under Canadian jurisdiction beyond the present limits of the Canadian territorial sea and fishing zones off the Canadian coast. It will permit Soviet vessels to fish in the area concerned, under Canadian authority and control, for resources surplus to Canadian requirements.

First Canadian honorary Carioca

Roger B. Blake, Canadian Consul in Rio de Janeiro (left) *presents to Canadian painter Paul Duff a medal and diploma of the Honorary Citizenship of Rio de Janeiro ("honorary Carioca") granted to him in May, by the Brazilian newspaper* O Globo *and the Municipality of Rio de Janeiro.*
He received the honour "for the excellent work he develops with 400 students of 40 different nationalities, helping them to adapt themselves to life in Rio, and as a painter, for the constant use of our vegetation in his paintings".
Mr. Duff, whose works were exhibited at the National Museum of Fine Arts of Brazil and in seven cities in that country, is the first Canadian to receive this distinction. A film of the ceremony, broadcast on prime time on the O Globo *TV chain, is reported to have reached some 22 million viewers.*