

## OBITUARY

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## Johanna Döbereiner

Johanna Döbereiner, a world-renowned microbiologist, died on 5 October 2000. According to the newspaper *Folha de Sao Paulo* (21 May 1995), Dr. Döbereiner was seventh amongst all Brazilian scientists in the ranking of citations of her publications, and first amongst female scientists. She has been a member of the Editorial Board of *Biology and Fertility of Soils* for many years.

Dr. Döbereiner was born in Czechoslovakia, studied agronomy at the University of Munich, Germany, and emigrated to Brazil in 1951. She started to work in the soil microbiology laboratory at the National Department for Agricultural Research (DNPEA) of the Ministry of Agriculture in Seropedica, became a Brazilian citizen in 1956 and completed postgraduate studies at the University of Wisconsin in 1963.

From 1963 to 1969, Dr. Döbereiner supervised a group of students researching into the factors limiting biological nitrogen fixation in tropical legumes. Most of the research in this area was influenced by her discoveries or stimulated by her enthusiasm. She contributed, among other things, to the success of the Brazilian soybean breeding program started in 1964. Without the use of nitrogen fertilizer for soybean, Brazil has been able to compete successfully on the international market to the extent that today it is the world's second largest producer of this crop.

The energy crisis in the 1970s renewed interest in nitrogen fixation research. Dr. Döbereiner was at the centre of studies on the associations between grasses/cereals and nitrogen-fixing bacteria from the early discovery of *Azotobacter paspali* associated with the roots of *Paspalum notatum* until the "endophytic" associations of nitrogen-fixing bacteria associated with grasses,

cereals and root crops. The agronomic importance of these associations was also demonstrated because some varieties of sugar cane were found to be able to produce the equivalent of 160 ton/ha with up to 200 kg nitrogen derived from the association with nitrogen-fixing bacteria.

Her achievements were acknowledged world-wide in various manners, as is evidenced by the long list of national and international prizes, honours and distinctions. She received honorary doctorates (Doctor Honoris Causa) from the University of Florida, USA, and from the Universidade Federal Rural do Rio de Janeiro. She was a member of the Brazilian Academy of Sciences, the Vatican Academy of Science, the Third World Academy of Science, received the National Federico de Menezes Vieira prize, the OAS Bernard Houssay prize, the UNESCO Science prize, the prize for Science and Technology of Mexico, the Order of Rio Branco, the Order of Merit of the National Judiciary and the Order of Merit of the Federal Republic of Germany.

Although her scientific contribution was very important, the most relevant aspects of her career were her leadership, enthusiasm and humanity (benevolence). Thus, the National Centre for Agrobiological Research was founded as a direct result of her leadership and research activity. Many scientists who were trained and inspired by her held leading positions in the scientific community. However, Johanna was more than a leader; she was a friend to many of her collaborators, and these scientists were also proud to have been associated with her.