

# History of Downy Mildew of Sunflower in Brazil

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Sunflower is an oilseed crop with wide adaptation, and represents a new option for the Brazilian farmers, in areas of grain production, for crop rotation and succession. The area cultivated with sunflower in Brazil is increasing, with an outlook of 100,000 ha in 1998 and 1998/99 growing seasons.

Diseases are one of the major limiting factors of sunflower production worldwide. In Brazil, it is a known host of at least 16 micro-organisms, mostly fungi, which reduce yield and quality. The most important diseases are *Alternaria* leaf and stem spots, seedling blight and head rot, caused by *Alternaria helianthi*, and *Sclerotinia* root and head rot, caused by *Sclerotinia sclerotiorum* (Embrapa, 1983 ; Leite, 1997).

Other disease that is concerning sunflower researchers is the downy mildew. The causal agent, *Plasmopara halstedii*, was found for the first time in 1982, in Santo Augusto and Veranópolis counties, in Rio Grande do Sul State, and later in Londrina, State of Paraná, in 1983 (Ferreira et al., 1983). The pathogen occurred in experimental plots. The affected plants were eradicated and burned. Studies on race identification showed the occurrence of the American race 2 (Henning & França Neto, 1985).

In 1993, in Curitiba, Paraná State, the disease was suspected to occur in experimental plots, but no race identification study was performed (E. Daros, personal communication).

After the pathogen detection and fast eradication in 1982 and 1983, a restrictive normatization was created by the Ministry of Agriculture, in order to protect from a possible reintroduction and spread of the disease. Since 1984, the importation of seeds of cultivated sunflower and other *Helianthus* species, and tubers of *H. tuberosus* was prohibited, if they come from Argentina, Canada, Chile, Spain, USA, France, Hungary, Iran, Israel, former Yugoslavia, Japan, Jordan, Pakistan, Dominican Republic, Romania, Russia, former Czechoslovakia, and Uruguay, or from other countries where *P. halstedii* was found (Ministério da Agricultura, Portaria nº 306, 11/10/84). The importation from these countries is only allowed for research material, with a phytosanitary certificate containing an additional statement indicating that the material has been produced in area free from *P. halstedii*. The quarantine procedures are performed at the National Center for Genetic Resources and Biotechnology of Embrapa, in Brasília, DF.

Since 1995, following the harmonization of quarantine procedures for Mercosul countries (Brazil, Argentina, Uruguay and Paraguay), the importation of sunflower seeds is allowed, and must be authorized by the Ministry of Agriculture (Ministério da Agricultura, Portaria nº 643, 03/10/95). This is particularly important for establishment of sunflower production in the country, since a large amount of sunflower is imported from Argentina. However, there is a continuous threat of reintroduction of *P. halstedii*, by infected seeds, specially from Argentina, where the disease is important (Pereyra & Escande, 1994).

Fortunately, the fungus is more prevalent and yield losses are more severe in temperate regions, compared to subtropical regions, like Brazil (Gulya et al., 1997). Nevertheless, control measures should be taken to prevent the disease. Efforts have been done by researchers in order to develop sunflower hybrids and open pollinated varieties for cultivation in Brazil, with genetic resistance to downy mildew. This is also subject of the sunflower breeding program carried out at Embrapa Soja.

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