

Potato germplasm enhancement for drought tolerance at Embrapa-Brazil

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In Brazil, potato is grown in more than 140,000 hectares. Embrapa, the Brazilian corporation for research in agriculture, coordinates a national potato breeding program. Given to the climate change prognosis, research activities aiming to evaluate potato germplasm for drought tolerance have been under development since 2006. A polyethylene-glycol-based methodology to simulate water deficit in hydroponic system was established. Experiments have been carried out annually at Embrapa Clima Temperado, Pelotas, RS, Brazil (41°40'42"S, 52°26'22.5"W), in one or two growing seasons per year, i.e. autumn/winter (March-July) and winter/spring (August-December). Potato genotypes have been evaluated for several morpho-agronomical and physiological traits. So far, around 50 genotypes, including old and modern potato varieties as well as advanced clones, were evaluated. Based on the results, it was concluded that potato genotypes respond differently to drought stress. It was also found that the negative effect of drought stress in tuber development and yield is more pronounced in spring than in autumn season, and that some varieties recently released by Embrapa have shown good performance under drought stress. The genetic mechanisms involved in potato drought tolerance are under study and molecular tools will be incorporated to help better understand the response of potato to drought stress.