

Review

## Drought tolerance in potato (*S. tuberosum* L.) Can we learn from drought tolerance research in cereals?

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Drought tolerance is a complex trait of increasing importance in potato. Our knowledge is summarized concerning drought tolerance and water use efficiency in this crop. We describe the effects of water restriction on physiological characteristics, examine the main traits involved, report the attempts to improve drought tolerance through *in vitro* screening and marker assisted selection, list the main genes involved and analyze the potential interest of native and wild potatoes to improve drought tolerance. Drought tolerance has received more attention in cereals than in potato. The review compares these crops for indirect selection methods available for assessment of drought tolerance related traits, use of genetic resources, progress in genomics, application of water saving techniques and availability of models to anticipate the effects of climate change on yield. It is concluded that drought tolerance improvement in potato could greatly benefit from the transfer of research achievements in cereals. Several promising research directions are presented, such as the use of fluorescence, reflectance, color and thermal imaging and stable isotope techniques to assess drought tolerance related traits, the application of the partial root-zone drying technique to improve efficiency of water supply and the exploitation of stressful memory to enhance hardiness.