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Genetic Opportunities to Improve Cereal Root Systems for Dryland Agriculture

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1) CSIRO Plant Industry

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Abstract: Understanding the major limitations to root growth is very important if we are to maximize water and nutrient use and increase yields. Limitations may be insufficient rooting depth, root diseases, nutrient deficiencies, toxicities and soil hardness. An understanding of these limitations will lead to more precisely identifying traits for which to select and breed. Examples of successfully overcoming limiting factors to improve crop performance by breeding and selection are given for cereal cyst nematodes in wheat, soil acidity and salinity. The importance of altered crop management practices to reduce limitations is also stressed. These have resulted in a more effective and healthier root system, which results in more water use and greater yields. Opportunities to genetically increase the size of the root system in dryland systems where water and nutrients are not all used by the crop are given.

Keywords: [Breeding](#), [Root growth](#), [Root health](#), [Root physiology](#), [Water uptake](#), [Wheat](#)



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