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Agronomic management of perennial wheat derivatives: using case studies from Australia to identify challenges

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Abstract

The prospective development of viable perennial cereal crops presents a unique management challenge. Unlike the development of other new crops such as triticale which could be quickly deployed into existing farming systems with only minimal adjustment, a perennial crop would require a substantial re-engineering of the farming system to take advantage of the production and ecosystem service benefits it potentially has to offer. Australia is a country in which pasture and crop production systems rely heavily on exotic species. Farming systems to utilise these species have therefore been developed over many decades and often differ markedly from production systems elsewhere around the world. The objective of this paper is to assess relevant case studies to identify likely challenges in the deployment of perennial cereal crops. Perennial cereal crops are likely to be dual purpose crops in the first instance used for grain and forage. In this regard there is similarity with annual grazing crops which are relatively new to Australian crop production systems. There is similarity also between a perennial cereal crop and a temperate perennial forage grass. Very few perennial forage grass swards are grown as monocultures due primarily for the need of legumes to supply nitrogen to the system through biological N_2 fixation. The major use of annual crops in polyculture occurs in inter-cropping systems which are mainly found in subsistence agriculture in the tropics. There is virtually no use of inter-cropping in developed nation agriculture so there is a need to develop management systems that can accommodate perennial cereals. This paper discusses current research in this field.