

Breeding lucerne for the Australian environment through a Private Public Partnership
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Lucerne (*Medicago sativa*) is grown mainly in the temperate wheat-sheep belt of Australia over about 3.5 million ha with an annual average rainfall range of 300-600mm. It is estimated that the dryland lucerne production area could double to 7 million ha⁽¹⁾ encompassing about 15% of the farm area in the low rainfall zones and up to 60% of the farm area in the high rainfall zones. This expansion can occur only if new varieties which can perform under new potential areas of expansion under diverse Australian conditions are available to growers through a reliable supply chain mechanism.

Currently, among 65 lucerne varieties marketed, 35 are high winter active types (dormancy classes 8-10) mostly catering to 2-3 years short term rotations and irrigation systems. Any expansion of lucerne area is expected occur predominantly in dryland areas which need varieties with dormancy classes 5-7.

Various challenges such as climate change, reduced water availability, acidic soils, routine drought and the need for low inputs require traits such as water use efficiency, persistence and grazing tolerance and acid soil tolerance. Varieties which maintain high quality and yield and perform consistently across a broad spectrum of areas are needed. Expansion of lucerne in the Mallee regions of Victoria (2.6 million ha) and New South Wales and parts of Western Australia where non-wetting sandy loams are common requires improved seedling vigour and rapid growth under low moisture. Tolerance to frost is important in southern areas of Australia where frost damage reduces hay quality. NSW and Western Australia have an estimated area of 5.6 million ha and 1.6 million ha of acidic soils respectively and lucerne expansion into these areas requires tolerance to Aluminium and Manganese toxicities. Lucerne varieties which result in lower enteric methane emissions from livestock, perform well under elevated CO₂ levels, capture higher levels of carbon, and super-nodulate to fix higher levels of biological nitrogen could provide a mitigating strategy for Australian Green House Gas emissions.

Varieties bred need to be delivered to growers in a reliable, timely manner. To achieve this outcome, the Australian Lucerne Alliance, an unincorporated joint venture has been established between NSW Department of Primary Industries and Seedmark, a large Australian production and merchandizing company. NSW DPI is involved in variety breeding and development and Seedmark, through its network of seed producers, conducts commercial production of certified seed which is then licensed to be marketed through a network of resellers and seed merchants. Regular interaction of alliance partners and information exchange ensures efficient product development and delivery to growers.

Reference

1. Robertson M, (2006). Lucerne Prospects: Drivers for widespread adoption of lucerne for profit and salinity management. Cooperative Research Centre for Plant Based Management of Dryland Salinity, ISBN 0-9775865-0-2.