

RESEARCH PAPERS

- Use of productivity-defined indicators to assess exposure of grassland-based livestock systems to climate change and variability
Marion Sautier, Michel Duru, Roger Martin-Clouaire 641
- Interspecific introgression of male sterility from tetraploid oilseed *Brassica napus* to diploid vegetable *B. rapa* through hybridisation and backcrossing
Zhengjie Wan, Yuanbao Tan, Minhui Shi, Yuejin Xu, Nader Aryamanesh, Guijun Yan 652
- Leaf growth and senescence rates of three pasture grasses and wheat
Helen G. Daily, Peter A. Lane, Shaun N. Lisson, Kerry L. Bridle, Stuart A. J. Anderson, Ross Corkrey 660
- Summer-active perennials in pasture systems improve seasonal pasture distribution without compromising winter-spring production
G. N. Ward, S. G. Clark, G. A. Kearney, M. R. McCaskill, M. C. Raeside, A. R. Lawson, R. Behrendt 673
- Morphology and Rubisco turnover characteristics of perennial ryegrass breeding populations after two and four cycles of divergent selection for long or short leaf length
Edith N. Khaembah, François Gastal, Serge Carre, Louis J. Irving, Philippe Barre, Cory Matthew 687
- Photosynthetic impairment caused by manganese toxicity and associated antioxidative responses in perennial ryegrass
Alejandra E. Ribera, Marjorie M. Reyes-Díaz, Miren R. Alberdi, Daniela A. Alvarez-Cortez, Zed Rengel, María L. Mora 696
- Herbicide efficacy for control of annual ryegrass (*Lolium rigidum* Gaud.) is influenced more by wheat seeding rate than row spacing
Deirdre Lemerle, Peter Lockley, Eric Koetz, Simon Diffey 708
- Characterisation of novel perennial ryegrass host–*Neotyphodium* endophyte associations
P. Tian, T.-N. Le, E. J. Ludlow, K. F. Smith, J. W. Forster, K. M. Guthridge, G. C. Spangenberg 716
- Interactions between waterlogging and ray blight in pyrethrum
Muhammad Javid, Pingjie Zhang, Paul W. J. Taylor, Sarah J. Pethybridge, Tim Groom, Marc E. Nicolas 726