

## David John Barker

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### Academic Qualifications:

#### **Doctor of Philosophy** in Plant Science

August 1987 - December 1990 (awarded: 22 December 1990)  
Agronomy Department, The University of Nebraska, USA

#### **Master of Agricultural Science** (with 1st Class Honours in Plant Science)

March 1981 - June 1983 (awarded: 4 May 1984)  
Agronomy Department, Massey University, New Zealand

#### **Bachelor of Agricultural Science**

March 1977 - November 1980 (awarded: 8 May 1981)  
Massey University, New Zealand

### Career Details:

#### **1 July 2005 - present**

Associate Professor (60% research, 40% teaching)  
Department of Horticulture and Crop Sciences, The Ohio State University

- Chair-elect Graduate Studies Committee 2005-06
- member Chair Search Committee 2006
- Chair Graduate Studies 2007-08

#### **1 July 2000 – 2005**

Assistant Professor (60% research, 40% teaching)  
Department of Horticulture and Crop Sciences, The Ohio State University

- member Academic Affairs Committee 2001-02

#### **12 December 1982 – 30 June 2000**

Scientist & Senior Scientist (90% research, 10% extension)  
New Zealand Pastoral Agriculture Research Institute Ltd. (AgResearch) (formerly DSIR)

### Professional activities

#### *Research*

My research has focused on the ecology of grasslands, under stressed conditions such as low fertility, drought and frequent grazing. Specific projects have included community-scale studies such as species composition and the balance between species in pastures subjected to stress. More detail studies have investigated the genetic structure of key species (white clover and ryegrass) within the population. Applied projects have evaluated new species and varieties under grazing, and this has developed over recent years to consideration of biodiversity effects in pastures, especially those effects related to species richness. Two studies have measured the effects of endophyte on grassland ecology."

*Teaching*

HCS200	The Science of Growing Plants	5 hr	taught 6 times, most recently SP07
HCS412	Forage Crops	3 hr	taught 7 times, most recently SP08
HCS612	Principles of Grassland Management	5 hr	taught 6 times, most recently AU07
HCS604.01	Methods in Plant Physiology (33%)	4 hr	taught 4 times, most recently AU07
HCS830	Topics in Plant Science	2 hr	taught twice, most recently WI08
HCS602	Field Crop Ecology	3 hr	taught once, WI05

## Graduate Advising (2000-2008):

PhD	1 completed	2 current
MS	3 completed	1 current
additional graduate committees	5 completed	4 current

## Grants (2003-2008):

- ◆ **D.J. Barker**, S. Loerch, C. Reynolds, R.M. Sulc, J. Bonta, L. Owens. Management intensive grazing to improve profitability of Appalachian hill-farms in south-east Ohio - Research and extension. (ranked in top 5%) NRI 66.0, 1 Oct 2006-30 Sep 2010 \$491,787
- ◆ **D.J. Barker**, S. Loerch, R.M. Sulc. Environmental, Forage, and Animal Impacts of Management-Intensive Grazing. Congressional Funding, 2006-07 & 2007-08 \$45,000
- ◆ J. Bigham, **D.J. Barker**. Meigs 2 Coarse Refuse Pile Reclamation with Reduced Soil Cover. CONSOL Energy Ltd. 1 July 2004 to 30 June 2010. \$353,836
- ◆ R.M. Sulc & **D.J. Barker**. Commercial Project, Proctor and Gamble. 2006-08 \$100,000
- ◆ **D.J. Barker**, S. Boyles, N. Cavender, F. Silveira, C. Penrose, J. Yost, J. McCutcheon, C. Little, P. Rzewnicki. Financial Implications of Non-toxic Endophyte-infected Fescue Pasture: Establishment Costs and Livestock Returns. USDA-Sustainable Agriculture Research and Education (SARE) (17 selected from 232 pre-proposals) 1 Jul 2003-30 Jun 2006. \$149,555

## Professional membership and service:

American Society of Agronomy (member, Associate Editor Agronomy Journal)  
 Crop Science Society of America (member, C6 Chair-elect 2005, C6 Chair 2006)  
 Ohio Forage and Grassland Council (member),  
 New Zealand Grassland Association (member)

## Awards &amp; Distinctions (last 5 years):

- AFGC Award of Merit June 2007
- Pomerene Departmental Teaching Excellence Award, 2006
- Price Advising Award, CFAES, Nov 2005
- Invited plenary presentation to the Biodiversity in Temperate Grazing Lands Symposium, Crop Science Society, Indianapolis IN 2003

## PUBLICATIONS (last 5 years)

### Refereed Journals (career 39)

1. P.R. Thomison, **D. J. Barker**, A. B. Geyer, L. D. Lotz, H. J. Siegrist, and T. L. Dobbels (2003) Amino acid composition of TopCross high-oil maize grain. *Plant Genetic Resources: Characterization and Utilization* 1:89-95.
2. White, T.A., **Barker, D.J.** and Moore, K.J. (2004) Vegetation diversity, growth, quality and decomposition in managed grasslands. *Agriculture Ecosystems and Environment* 101:73-84.
3. White, T.A., **Barker, D.J.** and Moore, K.J. (2004) The importance of local scale processes to landscape scale patterns of grassland vegetation diversity. *New Zealand journal of agricultural research* 47:199-207.
4. M.B. Dodd, **D.J. Barker**, and M.E. Wedderburn. 2004. Plant diversity effects on herbage production and compositional changes in New Zealand hill country pastures. *Grass and Forage Sci.* 59:29-40.
5. M. A. Sanderson, **D. J. Barker**, G.R. Edwards, B. Tracy, R. H. Skinner, and D. Wedin (2004) Plant species diversity and management of temperate forage and grazing land ecosystems. *Crop Sci.* 44:1132-1144.
6. T. L. Bultemeier, **D. J. Barker**, R. M. Sulc, S. K. Harrison, E.E. Regnier. 2005. Species interactions with quackgrass and their effects on forage production. *Crop Sci.* 45:290-296.
7. **D. J. Barker**, R. M. Sulc, T. L. Bultemeier, J. McCormick, R. Little, C. D. Penrose, D. Samples. 2005. Contrasting toxic-endophyte contamination between endophyte-free and nontoxic-endophyte tall fescue pastures. *Crop Sci.* 45:616-625.
8. M. E. Wedderburn, **D. J. Barker**, D. F. Chapman, S. J. Orr, and N. Dymock. 2005. Genetic differentiation in white clover (*Trifolium repens*) populations during 8 years of contrasting phosphorus supply in New Zealand hill country. *New Zealand journal of agricultural research* 48:63-74.
9. McCormick, J.S., R.M. Sulc, **D.J. Barker**, and J.E. Beuerlein. 2006. Yield and nutritive value of autumn-seeded winter-hardy and winter-sensitive annual forages. *Crop Sci.* 46:1981-1989.
10. Chapman, D.F., A.J. Parsons, G.P. Cosgrove, **D.J. Barker**, D.M. Marotti, K.J. Venning, S.M. Rutter, J. Hill, and A.N. Thompson. 2007. Impacts of spatial patterns in pasture on animal grazing behaviour, intake and performance. *Crop Sci.* 47:399-415.
11. Zahreddine, H.G., **D. J. Barker**, M. F. Quigley, K. Sleem and D. K. Struve. 2007. Patterns of woody species diversity in Lebanon as affected by climatic and soil properties. *Lebanese Science Journal* 8: 21-44.

### Refereed Proceedings and Chapters (career 58)

1. **Barker, D.J.**; R.M. Sulc, A. Deak, M.H. Hall, M.A. Sanderson, and T.L. Bultemeier. 2003. Performance of pastures with high and low species richness in northeast USA. *American Forage and Grasslands Congress Proceedings* 12:172-176.
2. Bultemeier, T.L.; **D.J. Barker**, R.M. Sulc, S.K. Harrison, and E.E. Regnier. 2003. Quackgrass contribution to production of pasture mixtures under grazing. *American Forage and Grasslands Congress Proceedings* 12:135-139.
3. Burgess, M.R.; **D.J. Barker**, D.L. Zartman, R.M. Sulc, and S.K. Harrison. 2003. Forage species and spatial effects on the dietary intake of goats. *American Forage and Grasslands Congress Proceedings* 12:182-186.
4. Dodd, M.B.; **D.J. Barker**; M.E. Wedderburn. 2003. Practical benefits of pasture diversity in hill country. *Proceedings of the New Zealand Grassland Association* 65: 127-132.
5. Lambert, M.G.; A.D. Mackay, B.P. Devantier, D.B. McDougall, **Barker, D.J.**, and Z. Park-Ng 2003. Redefining the production potential of hill pastures using fertiliser nitrogen. *Proceedings of the New Zealand Grassland Association* 65:35-40.
6. **Barker, D.J.**, and M. Collins. 2003. Forage fertilization and nutrient management. p. 263-293. In. Forages: Volume I. An Introduction to Grassland Agriculture. R.F Barnes, C.J. Nelson, M. Collins and K.J. Moore, Editors. Iowa State Press/Blackwell Publishing Company, Ames, Iowa. 6<sup>th</sup> Edition.
7. Burgess, M.R., **D.J. Barker**, D.A. Mangione, R.M. Sulc, S.K. Harrison and D.L. Zartman. 2004. Financial analysis of three pasture types for meat goat production from grazing. *Proceedings of the American Forage and Grasslands Congress* 13: 245-249

8. McCormick, J.S., R.M. Sulc, **D.J. Barker**, J.E. Beuerlein and L.H Rhodes (2004) Forage yield and quality of winter-hardy cereals and winter-sensitive species for grazing. *American Forage and Grasslands Congress Proceedings* 13: 225-229.
9. Blevins, D., and **D.J. Barker**. 2004. Plant nutrient and water interactions. *In*. Forages: Volume II. The Science of Grassland Agriculture. R.F Barnes, C.J. Nelson, M. Collins and K.J. Moore, Editors. Iowa State Press/Blackwell Publishing Company, Ames, Iowa. 6<sup>th</sup> Edition.
10. **Barker, D.J.** and R.M. Sulc. 2005. Forage crops and rangeland. Chapter 20 *in* Hartmann's Plant Science: Growth, Development, and Utilization of Cultivated Plants (4th Edition). ed. M. McMahon *et al.* Publ. Prentice Hall (in press).
11. Hume D.E. and **Barker D.J.** 2005. Growth and Management of Endophytic Grasses in Pastoral Agriculture. p. 199-225. *In* C.A. Roberts, C.P. West, and D.E. Spiers (eds.) *Neotyphodium* in cool-season grasses. Blackwell Publishing, Ames, IA. *Proceedings of the Fifth International Symposium on Neotyphodium/Grass Interactions, Fayetteville, Arkansas, USA. 23-26 May 2004.*
12. Sulc, R.M., and **D.J. Barker**. 2005. Forage production. Chapter 7 *In* Ohio Agronomy Guide, 14th ed. Bull. 472, Ohio State Univ. Extension, Columbus. Pp 89-116.
13. **Barker, D. J.**, and Sulc, R. M. 2005. Pasture and grazing management. Chapter 9 *In* Ohio Agronomy Guide, 14th ed. Bull. 472, Ohio State Univ. Extension, Columbus. Pp 124-134.
14. **Barker, D.J.**, R.M. Sulc, M.R. Burgess, T.L. Bultemeier. 2005. Species richness affects grassland yield and yield stability across seasons, sites and years. p 130. *In* J.A. Milne (ed.) Pastoral Systems in Marginal Environments. Wageningen Academic Publishers. *Proceedings of a Satellite Workshop of the XXth International Grassland Congress. Glasgow, Scotland. July 2005*
15. **Barker, D.J.**, R. Little, D. Samples, C.D. Penrose, R.M. Sulc, J.S. McCormick, T.L. Bultemeier, M.R. Burgess. 2005. Comparative lamb and heifer growth rates on non-toxic and endophyte-free tall fescue. *Proceedings of the American Forage and Grasslands Congress 14: 72-75.*
16. Brown, C.L.; **D.J. Barker**, B.K. Slater. 2007. Spatial variation of endophyte distribution in beef and dairy cattle pasture. *Proceedings of the American Forage and Grasslands Congress 16: 34-37.*
17. Diedrick, K. A., Sulc, R. M., **Barker, D. J.**, and McCormick, J. S. 2007. Field performance of alfalfa cultivars selected for resistance to lodging and fast recovery after harvest. *Proceedings of the American Forage and Grassland Council 16:100-103.*
18. Hensler, A.L., **D.J. Barker**, R.M. Sulc, S.C. Loerch, and L.B. Owens. 2007. Comparison of management intensive and continuous grazing in beef cattle pasture. *Proceedings of the American Forage and Grassland Council 16:48-50.*

### Abstracts and Other publications (career 36)

1. Sulc et al. 2003. Crop integration. [CD-ROM Computer File] ASA Abstracts. ASA, Madison, WI.
2. **Barker, D.J.**, Penrose, C.; Sulc, R.M.; Little, R.; Samples, D. 2003. Persistence of non-toxic endophyte fescue in S.E. Ohio. *Proceedings of the National Assoc of County Ag Agents (NACAA)* 88:38-39.
3. Samples, D.H., Sulc, R.M, **Barker, D.J.**, Lewandowski, R., Penrose, C.D. 2003. Seeding Method Comparisons to Improve Kura Clover Establishment. Poster at the Grazinglands Conservation Initiative (GLCI) National Conference, Nashville, TN 7-10 December.
5. **D.J. Barker**, N.S. Hill, and J.G. Andrae (2003) Measuring endophyte in tall fescue - plants, fields and farms. Chapter 6 in the online e-book "Tall Fescue Information System" <http://forages.oregonstate.edu/is/tfis/>
6. Bultemeier, T. L. and **Barker, D. J.** [advisor]. Species Interactions with Quackgrass and Their Effect on Forage Production. M.S., The Ohio State University, 2003.
7. Burgess, M.R. and **Barker, D. J.** [advisor]. Species Richness and Spatial Pattern Effects on Goat Intake. M.S., The Ohio State University, 2003.
8. **Barker, D.J.**, Landon Rhodes, Megan Burgess, Rory Lewandowski, Tom Noyes, Dean Slaters (2004) Factors Affecting the Occurrence of Endophyte in Perennial Ryegrass and Tall Fescue in Ohio Dairy Pastures. *American Forage and Grasslands Congress Proceedings 13:505.*

9. **Barker, D.J.**, R. M. Sulc, M. R. Burgess, M. H. Hall, A. Deak, M. A. Sanderson (2004) Effects of Biodiversity on Forage Yield in Wet and Dry Years. [CD-ROM Computer File] Agronomy Abstracts #5780 ASA, Madison, WI.
10. McCormick, J.S., R.M. Sulc, **D.J. Barker**, and J.E. Beuerlein. 2005. Customizing rising plate meter calibration for annual species and environments. *American Forage and Grasslands Congress Proceedings* 14: 203.
11. Liu, J., **D.J. Barker**, R.M. Sulc, J.C. Jang, and G.L. Wang. 2005. Identifying Cultivars within Perennial Ryegrass Blends Using SSRs. [CD-ROM Computer File] Agronomy Abstracts #67-10 ASA, Madison, WI.
12. Chapman, D.F., G. Cosgrove, A.J. Parsons, and **D.J. Barker**. 2005. Impacts of Spatial Patterns in Grassland on Animal Grazing Behavior, Intake and Performance. [CD-ROM Computer File] Agronomy Abstracts #254-3 ASA, Madison, WI.
13. Okoboi, A.C., **D.J. Barker**, J.C. Jang, J. Metzger, D.E. Somers, and R.M. Sulc. 2005. Physiological Responses of C<sub>4</sub> Grasses to Drought Stress. [CD-ROM Computer File] Agronomy Abstracts #315-4 ASA, Madison, WI.
14. Okoboi, A.C., **D.J. Barker**. 2006. Leaf Carbon, Oxygen Isotope Ratios and Water Relations in two NAD-ME and two NADP-ME C<sub>4</sub> Grasses. [CD-ROM Computer File] Agronomy Abstracts #72-7 ASA, Madison, WI.
15. Fae, G.S., R.M. Sulc, **D.J. Barker**, R.K. Dick, and M.L. Eastridge. 2007. Changes in soil carbon and soil physical properties in an integrated crop-livestock system. In Proc. Intl. Symp. Integrated Crop-Livestock Systems. 13-15 Aug. 2007. Curitiba, Brazil
16. **D.J. Barker**, G.S. Halich, R.M. Sulc, and K. Mack. 2008. Financial Analysis of Tall Fescue Technologies on Grazing Farms. [CD-ROM Computer File] #2207 American Forage and Grassland Council (AFGC), Elmhurst, IL.
17. A.L. Hensler, **D.J. Barker**, R.M. Sulc, S.C. Loerch, and L.B. Owens. 2008. Pasture Growth and Decomposition under Continuous and Rotational Grazing [CD-ROM Computer File] #2180 American Forage and Grassland Council (AFGC), Elmhurst, IL.
18. T. M. Smith, **D.J. Barker**, and M.R. Anderson. 2008. Pre-Graze Mowing: A Cost-Benefit Analysis. [CD-ROM Computer File] #2268 American Forage and Grassland Council (AFGC), Elmhurst, IL.
19. G. Fae, R.M. Sulc., and **D.J. Barker**. 2008. Building Soil Organic Matter While Extending the Grazing Season With Cover Crops [CD-ROM Computer File] #1580 American Forage and Grassland Council (AFGC), Elmhurst, IL.

## Statements

- PhD Study (Okoboi). Andrew has completed basic research in the physiological responses of native (C4) grasses to drought. C4 plants can be split into 2 group based on their physiology (NAD-types, and NADP-types). He found these have characteristically different drought responses.
- PhD study (Liu). In 2006 we developed a SSR system to differentiate four cultivars of ryegrass. In 2007 we developed a statistical application for SSR analyses that allowed us see genetic drift, (different cultivar proportions) in field populations subjected to 5 years grazing.
- PhD study (Smith). In 2007 we conducted a study to investigate the benefits of mowing surplus late-spring pasture within grazing systems. Overall, there were few effects of mowing on cattle intake, however mowing did reduce upper-horizon sheep grazing and increase lower-horizon sheep grazing. We concluded that the benefits of mowing grazed pasture are predominantly cosmetic.
- As Chair of Graduate Studies during 2007 it has been exciting to see the growth of this program from 43 students to 52 students from 2006 to 2008. During this time the Graduate Program was evaluated as being among the top 3 PhD programs in the College, we won a record number of University Fellowships in 2008 and fully reviewed and revised the graduate curriculum.