

CURRICULUM VITAE

NAME

David Blair COATES

DATE & PLACE OF BIRTH

1941, Brisbane, Australia

MARITAL STATUS

Married, two children

EDUCATION

Primary : Ascot State School, Brisbane, Qld.
Secondary : Anglican Boys School, Brisbane, Qld.
Tertiary : University of New England, Armidale, NSW.
Degree : B. Rur. Sci. Hons. I and University Medal (1963).

POSITIONS HELD

1964-66 Agricultural Overseer, Camboon Pastoral Co., Theodore, Qld.
1966-78 Officer-in-Charge, CSIRO, Narayen Research Station, Mundubbera, Qld.
1979-81 Officer-in-Charge, CSIRO, Kimberley Research Station, Kununurra, WA.
1982-88 Senior Experimental Scientist, CSIRO, Division of Tropical Crops and Pastures, Townsville, Qld.
1989-92 Senior Experimental Scientist and Project Leader, CSIRO, Townsville.
1993-00 Senior Research Scientist, CSIRO Tropical Agriculture (formerly Division of Tropical Crops and Pastures).
2000-02 Senior Research Scientist, CSIRO Sustainable Ecosystems
2002- 05 Principal Research Scientist, CSIRO Sustainable Ecosystems

July 2005 Retired as a CSIRO employee
August – October 2005 Research Fellow with CSIRO Sustainable Ecosystems
October 2005 (ongoing) – Work for CSIRO Sustainable Ecosystems as a Research Fellow under contract

EXPERIENCE AND RESEARCH INTEREST

At Camboon Pastoral Co. the work was all of a practical and commercial nature on a large cattle station (or complex of stations) for breeding and fattening. Work included maintenance of facilities; cattle husbandry and management; fodder cropping and improved pasture development.

O.I.C. of Narayen Research Station - a 9000 ha research station in south east Queensland with large areas of black speargrass and Brigalow country and a cattle herd in excess of 2000 head. Work included establishment, development and management of the research station including management of resident staff.

Research involvement - comparative performance of Hereford and Belmont Red cattle
- breeder performance on native and improved pasture.

O.I.C. of Kimberley Research Station - irrigated crops and pastures for the monsoonal tropics; management and upgrading of all facilities over a three year period.

Research involvement - agronomy of grain sorghum.

Davies Laboratory, Townsville

- (i) 1982-1995: full time research on the phosphorus nutrition of legume based pastures and of cattle in the semi-arid tropics. The research was on stylo based grass/legume pastures and considered soil, plant and animal aspects. Research included diet selection studies using steers fistulated at the oesophagus; diet selection using the ratio of carbon isotopes in the faeces; the use of isotope ³²P for measuring dietary phosphorus concentration; P kinetics and the assessment of the P requirements for growth and reproduction of cattle grazing tropical pastures.
- (ii) 1994-2005: faecal NIRS for predicting diet quality, faecal attributes and animal performance of free grazing cattle
- (iii) 2005-2007: CSIRO Research Fellow CSIRO Sustainable Ecosystems)

OVERSEAS VISITS

1. Thirty-day consultancy in Thailand as a beef cattle expert for 'The King's Project' inland from Hua Hin in southern Thailand. (1974).
2. Short visit to New Zealand (3 weeks) research stations in North and South Islands. (1978).
3. Three-week consultancy in the Ivory Coast of West Africa with GRM International as a pasture expert. (1979).
4. Five-month study tour in South Africa (7 weeks) and USA (Texas A&M, North Carolina, Florida, Wyoming and Utah) (1992).

PUBLICATIONS

PAPERS

1. Mannelje, 't L. and **Coates, D.B.** (1976) Effects of pasture improvement on reproduction and pre-weaning growth of Hereford cattle in central sub-coastal Queensland. *Proceedings of the Australian Society of Animal Production* **11**: 257-260.
2. **Coates, D.B.** and Bean, K.G. (1978) Post-weaning growth rates of Belmont Red and Hereford steers. *Proceedings of the Australian Society of Animal Production* **12**: 218.
3. Lawn, R.J., Russell, J.S., Williams, R.J. and **Coates, D.B.** (1978) Regur: a black gram (*Vigna mungo* (L.) Hepper) cultivar for grain production. *Journal of the Australian Institute of Agricultural Science* **44**: 112-114.
4. Foale, M.A. and **Coates, D.B.** (1980) Yield ceiling for grain sorghum in the Ord River Irrigation Area. *Proceedings of the Australian Agronomy Conference*, Lawes, Q. p. 253.
5. Foale, M.A. and **Coates, D.B.** (1982) Contrasting effects of population density on yield of irrigated grain sorghum in the Ord River Irrigation Area. In 'Agronomy Australia 1982' p. 221. (Australian Society of Agronomy: Parkville, Vic.)

6. Muchow, R.C., **Coates, D.B.**, Wilson, G.L. and Foale, M.A. (1982) Growth and productivity of irrigated *Sorghum bicolor* (L. Moench) in northern Australia. I. Plant density and arrangement effects on light interception and distribution, and grain yield, in the hybrid Texas 610SR in low and medium latitudes. *Australian Journal of Agricultural Research* **33**: 773-784.
7. Foales, M.A., Wilson, G.L., **Coates, D.B.** and Haydock, K.P. (1984) Growth and productivity of irrigated *Sorghum bicolor* (L. Moench) in northern Australia. II. Low solar altitude as a possible seasonal constraint to productivity in the tropical dry season. *Australian Journal of Agricultural Research* **35**: 229-238.
8. **Coates, D.B.** and Crane, D.H. (1984) Changes in the relative performance ratings for growth of Belmont Red bulls from weaning to 32 months old. *Animal Production in Australia* **15**: 297-300.
9. Muchow, R.C. and **Coates, D.B.** (1986) An analysis of environmental limitations to yield of irrigated grain sorghum during the dry season in tropical Australia using a radiation interception model. *Australian Journal of Agricultural Research* **37**: 135-148.
10. **Coates, D.B.**, Mannetje, 't L. and Seifert, G.W. (1987) Reproductive performance and calf growth to weaning of Hereford and Belmont Red cattle in subtropical, subcoastal Queensland. *Australian Journal Of Experimental Agriculture* **27**: 1-10.
11. **Coates, D.B.**, Schachenmann, P. and Jones, R.J. (1987) Reliability of extrusa samples collected from steers fistulated at the oesophagus to estimate the diet of resident animals in grazing experiments. *Australian Journal Of Experimental Agriculture* **27**: 739-745.
12. **Coates, D.B.** (1987) Effect of phosphorus as fertilizer or supplement on the liveweight gain of cattle grazing stylo pastures. In: Herbivore nutrition research: research papers presented at the second International Symposium on the Nutrition of Herbivores, University of Queensland, 6-10 July, 1987. Ed. M. Rose. (Australian Society of Animal Production occasional publication) pp. 213-214.
13. **Coates, D.B.** and Mannetje, 't L. (1990) Productivity of cows and calves on native and improved pasture in subcoastal, subtropical Queensland. *Tropical Grasslands* **24**: 46-54.
14. Jones, R.J., **Coates, D.B.** and McCaskill, M.R. (1990) Pasture and climatic effects on cattle liveweight gain from stylo based pastures in the seasonally dry tropics. *Animal Production in Australia* **18**: 260-263.
15. **Coates, D.B.**, Van der Weide, A.P.A. and Kerr, J.D. (1991) Changes in faecal delta 13C in response to changing proportions of legume (C3) and grass (C4) in the diet of sheep and cattle. *Journal of Agricultural Science, Cambridge* **116**: 287-295.
16. **Coates, D.B.**, Kerridge, P.C., Miller, C.P. and Winter, W.H. (1990) Phosphorus and beef production in northern Australia 7. The effect of phosphorus on the botanical composition, yield and quality of grass-legume pastures and their relationships with animal production. *Tropical Grasslands* **24**: 209-220.
17. Winter, W.H., **Coates, D.B.**, Hendricksen, R.E., Kerridge, P.C., McLean, R.W. and Miller, P.C. (1990) Phosphorus and beef production in northern Australia 4. The reponse of cattle to fertiliser and supplementary phosphorus. *Tropical Grasslands* **24**: 170-184.
18. Wadsworth, J.C., McLean, R.W., **Coates, D.B.** and Winter, W.H. (1990) Phosphorus and beef production in northern Australia 5. Animal phosphorus status and its diagnosis in beef production. *Tropical Grasslands* **24**: 185-196.
19. McLean, R.W., Hendricksen, R.E., **Coates, D.B.** and Winter, W.H. (1990) Phosphorus and beef production in northern Australia 6. Dietary attributes and their relationship to beef production as affected by phosphorus. *Tropical Grasslands* **24**: 197-208.

20. Kerridge, P.C., Gilbert, M.A. and **Coates, D.B.** (1990) Phosphorus and beef production in northern Australia 8. The status and management of soil phosphorus in relation to beef production. *Tropical Grasslands* **24**: 221-230.
21. Miller, P.C., Winter, W.H., **Coates, D.B.** and Kerridge, P.C. (1990) Phosphorus and beef production in northern Australia 9. Strategies for phosphorus use. *Tropical Grasslands* **24**: 239-249.
22. **Coates, D.B.** (1991) Long term botanical studies show Sabi grass to be tolerant of low soil phosphorus. *Tropical Grasslands* **25**: 229-230.
23. **Coates, D.B.** and Ternouth, J.H. (1992) Phosphorus kinetics of cattle grazing tropical pastures and implications for the estimation of their phosphorus requirements. *Journal of Agricultural Science, Cambridge* **119**: 401-409.
24. Jones, R.J. and **Coates, D.B.** (1992) The effect of age on steer liveweight gain on continuously stocked tropical pastures. *Animal Production in Australia* **19**: 39-42.
25. **Coates, D.B.**, Ash, A.J. and McLean, R.W. (1993) Diet selection, diet quality, dry matter intake and growth rate of cattle grazing tropical grass-legume pasture. *Proceedings of the XVII International Grassland Congress*, Palmerston North, New Zealand; Hamilton, New Zealand; Lincoln, New Zealand and Rockhampton, Australia.
26. **Coates, D.B.** (1994) The effect of phosphorus as fertiliser or supplement on pasture and cattle productivity in the semi-arid tropics of north Queensland. *Tropical Grasslands* **28**: 90-108.
27. Murray, R.M., Heard, R.W., Tiddy, R., Boniface, A.N. and **Coates, D.B.** (1994) Tail-bone densitometry as a technique for measuring bone mineral status in cattle. *Animal Production in Australia* **20**: 325-328.
28. **Coates, D.B.** and Murray, R.M. (1994) Tail-bone density compared with other indicators of phosphorus deficiency in cattle. *Animal Production in Australia* **20**: 329-332.
29. **Coates, D.B.** (1995) The effect of phosphorus as fertiliser or supplement on the forage intake of heifers grazing stylo-based pastures. *Australian Journal of Experiment Agriculture* **35**: 181-188.
30. **Coates, D.B.** (1996) Verano and Seca stylos - comparative digestibility, crude protein and mineral levels of plucked shoots. *Tropical Grasslands* **30**: 134.
31. **Coates, D.B.**, Ternouth, J.H., Miller, C.P. and White, S.J. (1996) Phosphorus kinetics in grazing Brahman-cross cows. *Proceedings of the Australian Society of Animal Production*. **21**: 380.
32. Miller, C.P., Fitzpatrick, L.A., White, S.J., **Coates, D.B.** and Ternouth, J.H. (1996) Effects of phosphorus on performance of grazing cows and calves. *Proceedings of the Australian Society of Animal Production*. **21**: 355.
33. Ternouth, J.H., Bortolussi, G., **Coates, D.B.**, Hendricksen, R.E. and McLean, R.W. (1996) The phosphorus requirements of growing cattle consuming roughage diets. *Journal of Agricultural Science, Cambridge*. **126**: 503-510.
34. **Coates, D.B.** (1996) Diet selection by cattle grazing *Stylosanthes*-grass pastures in the seasonally dry tropics: effect of year, season, stylo species and botanical composition. *Australian Journal of Experimental Agriculture*. **36**: 781-789.
35. **Coates, D.B.** (1997) The recovery of Nixon Sabi grass pastures following severe drought. *Tropical Grasslands*. **31**: 67-72.
36. Ternouth, J.H. and **Coates, D.B.** (1997) Phosphorus homeostasis in grazing breeder cattle. *Journal of Agricultural Science, Cambridge*. **128**: 331-337.
37. **Coates, D.B.**, Miller, C.P., Hendricksen, R.E. and Jones, R.J. (1997) Stability and productivity of *Stylosanthes* pastures in Australia. II. Animal production from *Stylosanthes* pastures. *Tropical Grasslands*. **31**: 494-502.

38. Jones, R.J., McIvor, J.G., Middleton, C.H., Burrows, W.H., Orr, D.M. and **Coates, D.B.** (1997) Long-term botanical changes and their implications in grazed *Stylosanthes* pastures. *Tropical Grasslands* **31**:482-493.
39. **Coates, D.B.** (1998) Diet composition of cattle grazing *Stylosanthes*-grass pastures in the seasonally dry tropics: the effect of phosphorus as fertiliser or supplement. *Australian Journal of Experiment Agriculture* **38**:7-15.
40. **Coates, D.B.** (1999) The use of faecal $\delta^{13}\text{C}$ values to improve the reliability of estimates of diet quality when sampling tropical pastures with oesophageal fistulated cattle. *Australian Journal of Experiment Agriculture* **39**:1-7.
41. **Coates, D.B.** (1999) Faecal spectroscopy (NIRS) for nutritional profiling of grazing cattle. Proceedings of the *VI International Rangeland Congress* Townsville, Australia. July 19-23 Vol. 1:466-467.
42. **Coates, D.B.** (2000) Predicting diet digestibility and crude protein content from the faeces of grazing cattle. Final Report of project CS.253 to the Meat Research Corporation, Sydney, Australia.
43. **Coates, D.B.** (2000) Faecal NIRS – what does it offer today’s grazier? *Tropical Grasslands* **34**:230-239.
44. Elgersma, A., Oerlemans, J.E. and **Coates, D.B.** (2001) The effect of browse species when fed as a supplement to low quality native grass hay on animal performance. *Proceedings of the XIX International Grassland Congress, Brazil* pp 712-713.
45. Kennedy, P.M., Lowry, J.B., **Coates, D.B.** and Oerlemans, J.E. (2001) Utilisation of tropical dry season grass by ruminants is increased by feeding fallen leaf of siris. *Animal Feed Science and Technology*.
46. **Coates, D.B.** (2001) Faecal NIRS – opening the door to a better understanding of nutrition. *Proceedings of the Northern Australia Beef Industry Conference 2001*, 8 & 9 November, Kununurra, Australia. pp 101 –105.
47. **Coates, D.B.** (2002) Potential and limitations in relation to the practical application of faecal NIRS technology in the northern beef industry. *BIA Workshop 2002*, 8 & 9 August, Longreach, Australia.
48. **Coates, D.B.** (2002) An empirical approach to the question “Is NIRS only as good as the laboratory reference values?” *Spectroscopy Europe*
49. **Coates, D.B.** (2002) Using faecal NIRS to predict growth rate in grazing cattle. Final Report of project NAP3.116 to Meat and Livestock Australia, Sydney.
50. Gibbs, S.J., **Coates, D.B.**, Poppi, D.P., McLennan, S.R. and Dixon, R.M. (2002) The use of faecal near infra-red spectroscopy to predict dietary digestibility and crude protein content for cattle fed supplements. *Proceedings of the Australian Society of Animal Production* **24**:
51. Boval, M., **Coates, D.B.**, Lecomte, P., Decruyenaere, V. and Archimede, H. (2004) Faecal near infrared reflectance spectroscopy (NIRS) to assess chemical composition, in vivo digestibility and intake of tropical grass by Creole cattle. *Animal feed Science and Technology* **114**, 19-29.
52. **Coates, D.B.** (2004) Improving reliability of faecal NIRS calibration equations. Final Report of Project NAP3.121 to Meat and Livestock Australia, Sydney.
53. Dixon, R.M. and **Coates D.B.** (2005) Using faecal NIRS to improve nutritional management of cattle in northern Australia. *Recent Advances in Animal Nutrition*, 11-13 July 2005, University of New England, Armidale, NSW.
54. **Coates, D.B.**, Dixon, R.M. and Sullivan, M. (2006) Using Faecal Near Infrared Reflectance Spectroscopy (F.NIRS) to measure the proportion of grass in the diet selected by cattle grazing tropical pastures. Proceedings of the 14th Biennial Conference of the Australian Rangeland Society, Renmark, South Australia, 3rd-7th September 2006 (In press).

BOOK CHAPTERS

1. Russell, J.S. and **Coates, D.B.** (1985) Narayen Research Station. In 'The Northern Challenge: a history of CSIRO crop research in northern Australia.' (Eds J.J. Basinski, I.M. Wood and J.B. Hacker.) pp. 129-146. CSIRO Aust. Div. Trop. Crops and Past. Res. Rep. No. 3.
2. **Coates, D.B.** (1994) Tropical legumes for large ruminants. In: *Tropical Legumes in Animal Nutrition*. Eds. D'Mello J.P.F. and Devendra, C. CAB International, Wallingford, UK. pp. 191-230.
3. **Coates, D.B.** (2000) Measuring animal performance. In: *Field and Laboratory Methods for Grassland and Animal Production Research*. Eds. Mannetje, L 't and Jones, R.M. CAB International, Wallingford, UK. In press.