The potential for carbon sequestration in Australian agricultural soils is technically and economically limited

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Supplementary Notes

(i) Studies included in the meta-analyses

1. Armstrong, R. D., Kuskopf, B. J., Millar, G., Whitbread, A. M. & Standley, J. Changes in soil chemical and physical properties following legumes and opportunity cropping on a cracking clay soil. *Aust. J. Exp. Agric.* **39,** 445–456 (1999).
2. Armstrong, R. D., Millar, G., Halpin, N. V., Reid, D. J. & Standley, J. Using zero tillage, fertilisers and legume rotations to maintain productivity and soil fertility in opportunity cropping systems on a shallow Vertosol. *Aust. J. Exp. Agric.* **43,** 141–153 (2003).
3. Blair, G. J. *et al.* Soil carbon changes resulting from sugarcane trash management at two locations in Queensland, Australia, and in North-East Brazil. *Aust. J. Soil Res.* **36,** 873–881 (1998).
4. Blair, N. Impact of cultivation and sugar-cane green trash management on carbon fractions and aggregate stability for a Chromic Luvisol in Queensland, Australia. *Soil Till. Res.* **55,** 183–191 (2000).
5. Blair, N. & Crocker, G. J. Crop rotation effects on soil carbon and physical fertility of two Australian soils. *Aust. J. Soil Res.* **38,** 71–84 (2000).
6. Blair, N., Faulkner, R. D., Till, A. R. & Crocker, G. J. Long-term management impacts on soil C, N and physical fertility. Part III: Tamworth crop rotation experiment. *Soil Till. Res.* **91,** 48–56 (2006).
7. Bünemann, E. K., Marschner, P., Smernik, R. J., Conyers, M. & McNeill, A. M. Soil organic phosphorus and microbial community composition as affected by 26 years of different management strategies. *Biol. Fertil. Soils* **44,** 717–726 (2008).
8. Burch, G. J., Mason, I. B., Fischer, R. A. & Moore, I. D. Tillage effects on soils: physical and hydraulic responses to direct drilling at Lockhart, N.S.W. *Aust. J. Soil Res.* **24,** 377–391 (1986).
9. Carter, M. R. & Mele, P. M. Changes in microbial biomass and structural stability at the surface of a duplex soil under direct drilling and stubble retention in north-eastern Victoria. *Aust. J. Soil Res.* **30,** 493–503 (1992).
10. Cavanagh, P. P., Koppi, A. J. & McBratney, A. B. The effects of minimum cultivation after three years on some physical and chemical properties of a red-brown earth at Forbes, N.S.W. *Aust. J. Soil Res.* **29,** 263–270 (1991).
11. Chan, K. Y. Consequences of changes in particulate organic carbon in Vertisols under pasture and cropping. *Soil Sci. Soc. Am. J.* **61,** 1376–1382 (1997).
12. Chan, K. Y. & Heenan, D. P. The effects of stubble burning and tillage on soil carbon sequestration and crop productivity in southeastern Australia. *Soil Use Manage.* **21,** 427–431 (2005).
13. Chan, K. Y., Heenan, D. P. & Oates, A. Soil carbon fractions and relationship to soil quality under different tillage and stubble management. *Soil Till. Res.* **63,** 133–139 (2002).
14. Chan, K. Y., Roberts, W. P. & Heenan, D. P. Organic carbon and associated soil properties of a red earth after 10 years of rotation under different stubble and tillage practices. *Aust. J. Soil Res.* **30,** 71–83 (1992).
15. Chataway, R. G., Cooper, J. E., Orr, W. N. & Cowan, R. T. The role of tillage, fertiliser and forage species in sustaining dairying based on crops in southern Queensland 2. Double-crop and summer sole-crop systems. *Anim. Prod. Sci.* **51,** 904–919 (2011a).

16. Chataway, R. G., Orr, W. N., Cooper, J. E. & Cowan, R. T. The role of tillage, fertiliser and forage species in sustaining dairying based on crops in southern Queensland 1. Winter-dominant forage systems. *Anim. Prod. Sci.* **51,** 890–903 (2011b).
17. Conteh, A., Blair, G. J. & Rochester, I. J. Soil organic carbon fractions in a Vertisol under irrigated cotton production as affected by burning and incorporating cotton stubble. *Aust. J. Soil Res.* **36,** 655–667 (1998).
18. Dalal, R. C. Long-term effects of no-tillage, crop residue, and nitrogen application on properties of a Vertisol. *Soil Sci. Soc. Am. J.* **53,** 1511–1515 (1989).
19. Dalal, R. C., Allen, D. E., Wang, W. J., Reeves, S. & Gibson, I. Organic carbon and total nitrogen stocks in a Vertisol following 40 years of no-tillage, crop residue retention and nitrogen fertilisation. *Soil Till. Res.* **112,** 133–139 (2011).
20. Dalal, R. C., Henderson, P. A. & Glasby, J. M. Organic matter and microbial biomass in a vertisol after 20 yr of zero-tillage. *Soil Biol. Biochem.* **23,** 435–441 (1991).
21. Dalal, R. C., Strong, W. M., Cooper, J. E. & King, A. J. No-tillage and nitrogen application affects the decomposition of ^{15}N-labelled wheat straw and the levels of mineral nitrogen and organic carbon in a Vertisol. *Aust. J. Exp. Agric.* **47,** 862–868 (2007).
22. Dalal, R. C. *et al.* Sustaining productivity of a Vertisol at Warra, Queensland, with fertilisers, no-tillage, or legumes 1. Organic matter status. *Aust. J. Exp. Agric.* **35,** 903–913 (1995).
23. Fettell, N. A. & Gill, H. S. Long-term effects of tillage, stubble, and nitrogen management on properties of a red-brown earth. *Aust. J. Exp. Agric.* **35,** 923–928 (1995).
24. Haines, P. J. & Uren, N. C. Effects of conservation tillage farming on soil microbial biomass, organic matter and earthworm populations, in north-eastern Victoria. *Aust. J. Exp. Agric.* **30,** 365–371 (1990).
25. Hamblin, A. P. The effect of tillage on soil surface properties and the water balance of a xeralfic alfisol. *Soil Till. Res.* **4,** 543–559 (1984).
26. Heenan, D. P., Chan, K. Y. & Knight, P. G. Long-term impact of rotation, tillage and stubble management on the loss of soil organic carbon and nitrogen from a Chromic Luvisol. *Soil Till. Res.* **76,** 59–68 (2004).
27. Holford, I. C. R., Schweitzer, B. E. & Crocker, G. J. Comparative effects of subterranean clover, medic, lucerne, and chickpea in wheat rotations, on nitrogen, organic carbon, and moisture in two contrasting soils. *Aust. J. Soil Res.* **36,** 57–72 (1998).
28. Hoyle, F. C., Murphy, D. V. & Fillery, I. R. P. Temperature and stubble management influence microbial CO_2-C evolution and gross N transformation rates. *Soil Biol. Biochem.* **38,** 71–80 (2006).
29. Hulugalle, N. R. Carbon sequestration in irrigated vertisols under cotton-based farming systems. *Commun. Soil Sci. Plant Anal.* **31,** 645–654 (2000).
30. Hulugalle, N. R. & Entwistle, P. Soil properties, nutrient uptake and crop growth in an irrigated Vertisol after nine years of minimum tillage. *Soil Till. Res.* **42,** 15–32 (1997).
31. Hulugalle, N. R., Weaver, T. B. & Scott, F. Continuous cotton and cotton-wheat rotation effects on soil properties and profitability in an irrigated Vertisol. *J. Sustain. Agric.* **27,** 5–24 (2005).
32. Ladd, J. N., Amato, M., Li-kai, Z. & Schultz, J. E. Differential effects of rotation, plant residue and nitrogen fertilizer on microbial biomass and organic matter in an Australian Alfisol. *Soil Biol. Biochem.* **26,** 821–831 (1994).
33. Li, L. *et al.* Soil physical qualities in an Oxic Paleustalf under different tillage and stubble management practices and application of S theory. *Soil Till. Res.* **113,** 82–88 (2011).

34. Loch, R. J. & Coughlan, K. J. Effects of zero tillage and stubble retention on some properties of a cracking clay. *Aust. J. Soil Res.* **22,** 91–98 (1984).
35. Mason, M. G. Effect of management of previous cereal stubble on nitrogen fertiliser requirement of wheat. *Aust. J. Exp. Agric.* **32,** 355–362 (1992).
36. Murphy, D. V. *et al.* Relationships between soil organic matter and the soil microbial biomass (size, functional diversity, and community structure) in crop and pasture systems in a semi-arid environment. *Soil Res.* **49,** 582–594 (2011).
37. Noble, A. D., Moody, P. & Berthelsen, S. Influence of changed management of sugarcane on some soil chemical properties in the humid wet tropics of north Queensland. *Aust. J. Soil Res.* **41,** 1133–1144 (2003).
38. Packer, I. J., Hamilton, G. J. & Koen, T. B. Runoff, soil loss and soil physical property changes of light textured surface soils from long-term tillage treatments. *Aust. J. Soil Res.* **30,** 789–806 (1992).
39. Pankhurst, C. E., Kirkby, C. A., Hawke, B. G. & Harch, B. D. Impact of a change in tillage and crop residue management practice on soil chemical and microbiological properties in a cereal-producing red duplex soil in NSW, Australia. *Biol. Fertil. Soils* **35,** 189–196 (2002).
40. Radford, B. J. & Thornton, C. M. Effects of 27 years of reduced tillage practices on soil properties and crop performance in the semi-arid subtropics of Australia. *Int. J. Energy Environ. Econ.* **19,** 565–588 (2011).
41. Robertson, F. A. & Thorburn, P. J. Management of sugarcane harvest residues: consequences for soil carbon and nitrogen. *Aust. J. Soil Res.* **45,** 13–23 (2007).
42. Roper, M. M., Gupta, V. V. S. R. & Murphy, D. V. Tillage practices altered labile soil organic carbon and microbial function without affecting crop yields. *Aust. J. Soil Res.* **48,** 274–285 (2010).
43. Saffigna, P. G., Powlson, D. S., Brookes, P. C. & Thomas, G. A. Influence of sorghum residues and tillage on soil organic matter and soil microbial biomass in an Australian Vertisol. *Soil Biol. Biochem.* **21,** 759–765 (1989).
44. Smettem, K. R. J., Rovira, A. D., Wace, S. A., Wilson, B. R. & Simon, A. Effect of tillage and crop rotation on the surface stability and chemical properties of a red-brown earth (Alfisol) under wheat. *Soil Till. Res.* **22,** 27–40 (1992).
45. Standley, J., Hunter, H. M., Thomas, G. A., Blight, G. W. & Webb, A. A. Tillage and crop residue management affect Vertisol properties and grain sorghum growth over seven years in the semi-arid sub-tropics. 2. Changes in soil properties. *Soil Till. Res.* **18,** 367–388 (1990).
46. Thomas, G. A., Dalal, R. C. & Standley, J. No-till effects on organic matter, pH, cation exchange capacity and nutrient distribution in a Luvisol in the semi-arid subtropics. *Soil Till. Res.* **94,** 295–304 (2007).
47. Thomas, G. A. *et al.* Pasture-crop rotations for sustainable production in a wheat and sheep-based farming system on a Vertosol in south-west Queensland, Australia. *Anim. Prod. Sci.* **49,** 682–695 (2009).
48. Thorburn, P. J., Meier, E. A., Collins, K. & Robertson, F. A. Changes in soil carbon sequestration, fractionation and soil fertility in response to sugarcane residue retention are site-specific. *Soil Till. Res.* **120,** 99–111 (2012).
49. Valzano, F. P., Greene, R. S. B., Murphy, B. W., Rengasamy, P. & Jarwal, S. D. Effects of gypsum and stubble retention on the chemical and physical properties of a sodic grey Vertosol in western Victoria. *Aust. J. Soil Res.* **39,** 1333–1347 (2001).

50. Van Gestel, M., Ladd, J. N. & Amato, M. Microbial biomass responses to seasonal change and imposed drying regimes at increasing depths of undisturbed topsoil profiles. *Soil Biol. Biochem.* **24,** 103–111 (1992).
51. Vu, D. T., Tang, C. & Armstrong, R. D. Tillage system affects phosphorus form and depth distribution in three contrasting Victorian soils. *Aust. J. Soil Res.* **47,** 33–45 (2009).
52. Wang, W. J. & Dalal, R. C. Carbon inventory for a cereal cropping system under contrasting tillage, nitrogen fertilisation and stubble management practices. *Soil Till. Res.* **91,** 68–74 (2006).
53. Whitbread, A., Blair, G., Konboon, Y., Lefroy, R. & Naklang, K. Managing crop residues, fertilizers and leaf litters to improve soil C, nutrient balances, and the grain yield of rice and wheat cropping systems in Thailand and Australia. *Agric. Ecosyst. Environ.* **100,** 251–263 (2003).
54. Whitbread, A. M., Blair, G. J. & Lefroy, R. D. B. Managing legume leys, residues and fertilisers to enhance the sustainability of wheat cropping systems in Australia 2. Soil physical fertility and carbon. *Soil Till. Res.* **54,** 77–89 (2000).
55. White, P. F. The influence of alternative tillage systems on the distribution of nutrients and organic carbon in some common Western Australian wheatbelt soils. *Aust. J. Soil Res.* **28,** 95–116 (1990).
56. Young, R. R., Wilson, B., Harden, S. & Bernardi, A. Accumulation of soil carbon under zero tillage cropping and perennial vegetation on the Liverpool Plains, eastern Australia. *Aust. J. Soil Res.* **47,** 273–285 (2009).

(ii) Search terms used for database compilation

Search terms included soil carbon/carbon sequestration/carbon storage/carbon stock, and tillage/no till/reduced tillage/conservation, or residue/straw/stubble/litter incorporation/retention/ burnt/addition, or rotation/pasture/conversion/grass, or fertiliser/nitrogen addition/application/input/fertilisation, or chemical properties, and Australia/cropping systems/farming/agriculture.

Supplementary Table S1 Studies used in the meta-analysis on the effect of conservation tillage on soil C

	n	*n*	Mean values								ln *r*	*U*	Experimental duration	Soil sampling depth									
			Soil C (%)		Soil C (Mg ha^{-1})		Practice																
Citation	control	treatment	control (CT)	treatment	control	treatment	control	treatment	weight	variance	%C	C stock (Mg C ha^{-1} year^{-1})	No. of years	category	depth (cm)	category for %C	category for C stock	% clay	soil type	Species	Location	State	Description of data source	Other treatment
Blair 2000	4	4	1.02	1.25	12.98	15.71	CT	NT	2	0.50	0.198	0.682	4	0-10	0-10	0-10	0-10	18	Chromic Luvisol; non-calcic brown soil	sugar cane	Mackay	QLD	Table 1	
Bünemann et al. 2008	3	3	1.70	2.89			CT	DD	1.5	0.67	0.531		26	21-30	0-5	0-10		29 (0-10 cm)	Chromic Luvisol; red earth	wheat-subclover	Wagga Wagga	NSW	Table 2	
Burch et al. 1986	3	3	1.76	1.84	24.42	24.73	CT	DD	1.5	0.67	0.042	0.106	3	0-10	0-10	0-10	0-10		red-brown earth		Lockhart	NSW	Table 3	non-fallow
Carter and Mele 1992	8	8	1.08	1.19			CT	DD	4	0.25	0.095		10	0-10	0-2.5	0-10		22 (0-10 cm)	calcic Luvisol	WW	Rutherglen	VIC	Table 1	stubble burnt
Cavangh et al. 1991	1	1	1.02	1.15	14.19	15.67	CT	DD	0.5	2.00	0.122	0.492	3	0-10	0-10	0-10	0-10	15	red-brown earth	WW	Forbes	NSW	Table 1	
Chan and Heelan 2005	3	3	1.55	1.83			CT	NT	1.5	0.67	0.166		5	0-10	0-5	0-10		15 (0-20 cm)	Alfisol; red-brown earth	WW-lupin	Temora	NSW	Table 2	stubble retained
Chan and Heelan 2005	3	3	1.60	1.91			CT	NT	1.5	0.67	0.177		5	0-10	0-5	0-10		15 (0-20 cm)	Alfisol; red-brown earth	WW-lupin	Temora	NSW	Table 2	stubble burnt
Chan and Heelan 2005	3	3			20.50	22.30	CT	NT	1.5	0.67		0.360	5	0-10	0-10		0-10	15 (0-20 cm)	Alfisol; red-brown earth	WW-lupin	Temora	NSW	Table 3	stubble retained
Chan and Heelan 2005	3	3			20.90	23.00	CT	NT	1.5	0.67		0.420	5	0-10	0-10		0-10	15 (0-20 cm)	Alfisol; red-brown earth	WW-lupin	Temora	NSW	Table 3	stubble burnt
Chan and Heelan 2005	3	3			19.90	25.40	CT	NT	1.5	0.67		0.289	19	11-20	0-10		0-10	27 (0-20 cm)	Chromic Luvisol; red earth	WW-lupin	Wagga Wagga	NSW	Table 3	stubble retained
Chan and Heelan 2005	3	3			17.70	24.10	CT	NT	1.5	0.67		0.337	19	11-20	0-10		0-10	27 (0-20 cm)	Chromic Luvisol; red earth	WW-lupin	Wagga Wagga	NSW	Table 3	stubble burnt
Chan and Heelan 2005	3	3	1.42	1.81			CT	NT	1.5	0.67	0.245		19	11-20	0-10	0-10		27 (0-20 cm)	Chromic Luvisol; red earth	WW-lupin	Wagga Wagga	NSW	Fig. 1	average of stubble retained and burnt
Chan and Heelan 2005	3	3	0.78	0.82	9.70	10.07	CT	NT	1.5	0.67	0.038	0.020	19	11-20	10-20	10-20	10-20	27 (0-20 cm)	Chromic Luvisol; red earth	WW-lupin	Wagga Wagga	NSW	Fig. 1	average of stubble retained and burnt
Chan et al. 1992	6	6	1.88	2.33			CT	DD	3	0.33	0.211		10	0-10	0-10	0-10		27 (0-20 cm)	red earth	WW-lupin	Wagga Wagga	NSW	Fig. 1	
Chan et al. 1992	6	6	1.15	1.04			CT	DD	3	0.33	-0.106		10	0-10	10-20	10-20		27 (0-20 cm)	red earth	WW-lupin	Wagga Wagga	NSW	Fig. 1	
Chan et al. 1992	6	6	1.88	1.92			CT	RT	3	0.33	0.018		10	0-10	0-10	0-10		27 (0-20 cm)	red earth	WW-lupin	Wagga Wagga	NSW	Fig. 1	
Chan et al. 1992	6	6	1.15	1.02			CT	RT	3	0.33	-0.118		10	0-10	10-20	10-20		27 (0-20 cm)	red earth	WW-lupin	Wagga Wagga	NSW	Fig. 1	
Chan et al. 1992	6	6			24.39	31.59	CT	DD	3	0.33		0.720	10	0-10	0-10		0-10	27 (0-20 cm)	red earth	WW-lupin	Wagga Wagga	NSW	Table 3	
Chan et al. 1992	6	6			17.52	16.01	CT	DD	3	0.33		-0.151	10	0-10	10-20		10-20	27 (0-20 cm)	red earth	WW-lupin	Wagga Wagga	NSW	Table 3	
Chan et al. 1992	6	6			24.39	25.54	CT	RT	3	0.33		0.115	10	0-10	0-10		0-10	27 (0-20 cm)	red earth	WW-lupin	Wagga Wagga	NSW	Table 3	
Chan et al. 1992	6	6			17.52	15.75	CT	RT	3	0.33		-0.177	10	0-10	10-20		10-20	27 (0-20 cm)	red earth	WW-lupin	Wagga Wagga	NSW	Table 3	
Chan et al. 2002	6	6	1.50	1.87	18.15	22.20	CT	DD	3	0.33	0.217	0.213	19	11-20	0-10	0-10	0-10	27 (0-20 cm)	red earth (Oxic Paleustalf)	WW-lupin	Wagga Wagga	NSW	Fig. 1	stubble retained
Chan et al. 2002	6	6	0.86	0.83	10.61	10.23	CT	DD	3	0.33	-0.039	-0.020	19	11-20	10-20	10-20	10-20	27 (0-20 cm)	red earth (Oxic Paleustalf)	WW-lupin	Wagga Wagga	NSW	Fig. 1	stubble retained
Chan et al. 2002	6	6	1.34	1.77	16.28	21.11	CT	DD	3	0.33	0.277	0.254	19	11-20	0-10	0-10	0-10	27 (0-20 cm)	red earth (Oxic Paleustalf)	WW-lupin	Wagga Wagga	NSW	Fig. 1	stubble burnt
Chan et al. 2002	6	6	0.72	0.83	8.90	10.27	CT	DD	3	0.33	0.146	0.072	19	11-20	10-20	10-20	10-20	27 (0-20 cm)	red earth (Oxic Paleustalf)	WW-lupin	Wagga Wagga	NSW	Fig. 1	stubble burnt
Chataway et al. 2011b	3	3	1.35	1.44	14.30	15.20	CT	NT	1.5	0.67	0.065	0.180	5	0-10	0-10	0-10	0-10	60 (0-10 cm)	haplic self-mulching black Vertosol	sorghum-oats	Kulpi	QLD	Table 10	
Chataway et al. 2011b	3	3	0.74	0.79	8.90	9.48	CT	NT	1.5	0.67	0.065	0.117	5	0-10	0-10	0-10	0-10	35 (0-10 cm)	brown Sodosol	sorghum-oats	Acland	QLD	Table 10	
Dalal 1989	4	4	1.71	1.72			CT	NT	2	0.50	0.006		13	11-20	0-10	0-10		65	Vertisol (Hermitage clay)	WW or Bly Bly	Warwick	QLD	Table 2	stubbke retained
Dalal 1989	4	4	1.74	1.92			CT	NT	2	0.50	0.098		13	11-20	0-10	0-10		65	Vertisol (Hermitage clay)	WW or Bly Bly	Warwick	QLD	Table 2	stubbke retained
Dalal 1989	4	4	1.79	1.94			CT	NT	2	0.50	0.080		13	11-20	0-10	0-10		65	Vertisol (Hermitage clay)	WW or Bly Bly	Warwick	QLD	Table 2	stubbke retained
Dalal 1989	4	4	1.66	1.70			CT	NT	2	0.50	0.024		13	11-20	0-10	0-10		65	Vertisol (Hermitage clay)	WW or Bly Bly	Warwick	QLD	Table 2	stubble burnt
Dalal 1989	4	4	1.68	1.60			CT	NT	2	0.50	-0.049		13	11-20	0-10	0-10		65	Vertisol (Hermitage clay)	WW or Bly Bly	Warwick	QLD	Table 2	stubble burnt
Dalal 1989	4	4	1.76	1.67			CT	NT	2	0.50	-0.052		13	11-20	0-10	0-10		65	Vertisol (Hermitage clay)	WW or Bly Bly	Warwick	QLD	Table 2	stubble burnt
Dalal 1989	4	4			16.72	18.12	CT	NT	2	0.50		0.108	13	11-20	0-10		0-10	65	Vertisol (Hermitage clay)	WW or Bly Bly	Warwick	QLD	Table 3	stubble average (burnt and retained)
Dalal 1989	4	4			17.75	17.71	CT	NT	2	0.50		-0.003	13	11-20	10-20		10-20	65	Vertisol (Hermitage clay)	WW or Bly Bly	Warwick	QLD	Table 3	stubble average (burnt and retained)
Dalal 1989	4	4			17.04	17.47	CT	NT	2	0.50		0.033	13	11-20	20-30		20-30	64	Vertisol (Hermitage clay)	WW or Bly Bly	Warwick	QLD	Table 3	stubble average (burnt and retained)
Dalal 1989	4	4			100.36	102.78	CT	NT	2	0.50		0.186	13	11-20	0-60			64	Vertisol (Hermitage clay)	WW or Bly Bly	Warwick	QLD	Table 3	stubble average (burnt and retained)
Dalal 1989	4	4			138.24	142.42	CT	NT	2	0.50		0.322	13	11-20	0-90			64	Vertisol (Hermitage clay)	WW or Bly Bly	Warwick	QLD	Table 3	stubble average (burnt and retained)
Dalal 1989	4	4			169.63	174.46	CT	NT	2	0.50		0.372	13	11-20	0-120			63.8	Vertisol (Hermitage clay)	WW or Bly Bly	Warwick	QLD	Table 3	stubble average (burnt and retained)
Dalal et al. 1991	4	4	1.75	1.65	17.83	16.88	CT	NT	2	0.50	-0.059	-0.047	20	11-20	0-10	0-10	0-10	65	Vertisol (Hermitage clay)	WW or Bly Bly	Warwick	QLD	Table 1	stubble burnt
Dalal et al. 1991	4	4	1.77	1.65	18.02	16.88	CT	NT	2	0.50	-0.070	-0.057	20	11-20	0-10	0-10	0-10	65	Vertisol (Hermitage clay)	WW or Bly Bly	Warwick	QLD	Table 1	stubble burnt
Dalal et al. 1991	4	4	1.77	1.76	18.02	17.93	CT	NT	2	0.50	-0.006	-0.005	20	11-20	0-10	0-10	0-10	65	Vertisol (Hermitage clay)	WW or Bly Bly	Warwick	QLD	Table 1	stubble burnt
Dalal et al. 1991	4	4	1.76	1.77	17.93	18.02	CT	NT	2	0.50	0.006	0.005	20	11-20	0-10	0-10	0-10	65	Vertisol (Hermitage clay)	WW or Bly Bly	Warwick	QLD	Table 1	stubbke retained
Dalal et al. 1991	4	4	1.79	1.81	18.21	18.40	CT	NT	2	0.50	0.011	0.009	20	11-20	0-10	0-10	0-10	65	Vertisol (Hermitage clay)	WW or Bly Bly	Warwick	QLD	Table 1	stubbke retained
Dalal et al. 1991	4	4	1.87	1.83	18.96	18.59	CT	NT	2	0.50	-0.022	-0.019	20	11-20	0-10	0-10	0-10	65	Vertisol (Hermitage clay)	WW or Bly Bly	Warwick	QLD	Table 1	stubbke retained
Dalal et al. 1995	4	4	0.70	0.76	7.74	8.38	CT	NT	2	0.50	0.082	0.129	5	0-10	0-10	0-10	0-10	56 (0-10 cm)	Vertisol (Typic Chromustert)	WW	Warra	QLD	Table 4	stubble removed
Dalal et al. 1995	4	4	0.71	0.80	7.85	8.81	CT	NT	2	0.50	0.119	0.193	5	0-10	0-10	0-10	0-10	56 (0-10 cm)	Vertisol (Typic Chromustert)	WW	Warra	QLD	Table 4	stubble removed
Dalal et al. 1995	4	4	0.76	0.77	8.38	8.49	CT	NT	2	0.50	0.013	0.021	5	0-10	0-10	0-10	0-10	56 (0-10 cm)	Vertisol (Typic Chromustert)	WW	Warra	QLD	Table 4	stubble removed
Dalal et al. 1995	4	4	0.69	0.66	7.63	7.31	CT	NT	2	0.50	-0.044	-0.040	8	0-10	0-10	0-10	0-10	56 (0-10 cm)	Vertisol (Typic Chromustert)	WW	Warra	QLD	Table 4	stubble removed
Dalal et al. 1995	4	4	0.69	0.71	7.63	7.85	CT	NT	2	0.50	0.029	0.027	8	0-10	0-10	0-10	0-10	56 (0-10 cm)	Vertisol (Typic Chromustert)	WW	Warra	QLD	Table 4	stubble removed
Dalal et al. 1995	4	4	0.69	0.76	7.63	8.38	CT	NT	2	0.50	0.097	0.094	8	0-10	0-10	0-10	0-10	56 (0-10 cm)	Vertisol (Typic Chromustert)	WW	Warra	QLD	Table 4	stubble removed
Dalal et al. 2007	4	4			8.40	8.40	CT	NT	2	0.50		0.000	11	11-20	0-10		0-10	56 (0-10 cm)	Vertisol (Typic Chromustert)	WW	Warra	QLD	Table 5	stubble retained
Dalal et al. 2007	4	4			9.10	8.50	CT	NT	2	0.50		-0.055	11	11-20	0-10		0-10	56 (0-10 cm)	Vertisol (Typic Chromustert)	WW	Warra	QLD	Table 5	stubble retained
Dalal et al. 2011	4	4			19.83	20.21	CT	NT	2	0.50		0.010	40	31-40	0-10		0-10	65 (0-10 cm)	Vertisol (black self-mulching cracking clay; Ustic Pellustert)	WW or BlyBly	Warwick	QLD	text (p. 135, left column)	average of stubble and N treatment
Fettell and Gill 1995	4	4	0.95	0.94	11.78	11.66	CT	DD	2	0.50	-0.011	-0.008	15	11-20	0-10	0-10	0-10	25	red-brown earth	WW	Condobolin	NSW	Table 3	stubble burnt
Fettell and Gill 1995	4	4	0.96	0.97	11.84	11.96	CT	DD	2	0.50	0.010	0.008	15	11-20	0-10	0-10	0-10	25	red-brown earth	WW	Condobolin	NSW	Table 3	stubble retained
Haines and Uren 1990	8	8	0.93	0.94			CT	DD	4	0.25	0.011		5	0-10	0-7.5	0-10		20 (surface)	solodic (sandy clay loam)	WW	Rutherglen	VIC	Table 2	stubble burnt
Haines and Uren 1990	8	8	0.54	0.52			CT	DD	4	0.25	-0.038		5	0-10	7.5-25	10-20		20 (surface)	solodic (sandy clay loam)	WW	Rutherglen	VIC	Table 2	stubble burnt
Hamblin 1984	6	6	0.86	0.93	10.70	11.55	CT	RT	3	0.33	0.078	0.281	3	0-10	0-10	0-10	0-10	25 (A horizon)	Xeralfic Alfisol	WW	Merredin	WA	Table 3	
Hamblin 1984	6	6	0.53	0.54	6.67	6.73	CT	RT	3	0.33	0.009	0.021	3	0-10	10-20	10-20	10-20	25 (A horizon)	Xeralfic Alfisol	WW	Merredin	WA	Table 3	
Hamblin 1984	6	6	0.44	0.44			CT	RT	3	0.33	0.000		3	0-10	20-25	20-30		25 (A horizon)	Xeralfic Alfisol	WW	Merredin	WA	Table 3	
Hamblin 1984	6	6	0.86	0.95	10.70	11.79	CT	NT	3	0.33	0.100	0.361	3	0-10	0-10	0-10	0-10	25 (A horizon)	Xeralfic Alfisol	WW	Merredin	WA	Table 3	
Hamblin 1984	6	6	0.53	0.55	6.67	6.85	CT	NT	3	0.33	0.028	0.061	3	0-10	10-20	10-20	10-20	25 (A horizon)	Xeralfic Alfisol	WW	Merredin	WA	Table 3	
Hamblin 1984	6	6	0.44	0.45			CT	NT	3	0.33	0.022		3	0-10	20-25	20-30		25 (A horizon)	Xeralfic Alfisol	WW	Merredin	WA	Table 3	
Hamblin 1984	6	6	0.88	0.96	10.94	11.91	CT	RT	3	0.33	0.087	0.160	6	0-10	0-10	0-10	0-10	25 (A horizon)	Xeralfic Alfisol	WW	Merredin	WA	Table 3	
Hamblin 1984	6	6	0.48	0.59	6.05	7.35	CT	RT	3	0.33	0.198	0.216	6	0-10	10-20	10-20	10-20	25 (A horizon)	Xeralfic Alfisol	WW	Merredin	WA	Table 3	
Hamblin 1984	6	6	0.44	0.44			CT	RT	3	0.33	0.000		6	0-10	20-25	20-30		25 (A horizon)	Xeralfic Alfisol	WW	Merredin	WA	Table 3	
Hamblin 1984	6	6	0.88	0.96	10.94	11.91	CT	NT	3	0.33	0.087	0.160	6	0-10	0-10	0-10	0-10	25 (A horizon)	Xeralfic Alfisol	WW	Merredin	WA	Table 3	
Hamblin 1984	6	6	0.48	0.59	6.05	7.41	CT	NT	3	0.33	0.206	0.226	6	0-10	10-20	10-20	10-20	25 (A horizon)	Xeralfic Alfisol	WW	Merredin	WA	Table 3	
Hamblin 1984	6	6	0.44	0.44			CT	NT	3	0.33	0.000		6	0-10	20-25	20-30		25 (A horizon)	Xeralfic Alfisol	WW	Merredin	WA	Table 3	
Heenan et al. 2004	6	6			19.37	18.85	CT	DD	3	0.33		-0.087	6	0-10	0-10		0-10	29 (0-10 cm)	red earth; Chromic Luvisol	lupin-WW	Wagga Wagga	NSW	Fig. 1	stubble retained
Heenan et al. 2004	6	6			20.12	19.25	CT	DD	3	0.33		-0.144	6	0-10	0-10		0-10	29 (0-10 cm)	red earth; Chromic Luvisol	lupin-WW	Wagga Wagga	NSW	Fig. 1	stubble burnt
Heenan et al. 2004	6	6			19.42	19.42	CT	DD	3	0.33		0.000	6	0-10	0-10		0-10	29 (0-10 cm)	red earth; Chromic Luvisol	sub. clover-wheat	Wagga Wagga	NSW	Fig. 1	stubble retained
Heenan et al. 2004	6	6			18.38	19.42	CT	DD	3	0.33		0.080	13	11-20	0-10		0-10	29 (0-10 cm)	red earth; Chromic Luvisol	lupin-WW	Wagga Wagga	NSW	Fig. 1	stubble retained
Heenan et al. 2004	6	6			15.50	18.38	CT	DD	3	0.33		0.222	13	11-20	0-10		0-10	29 (0-10 cm)	red earth; Chromic Luvisol	lupin-WW	Wagga Wagga	NSW	Fig. 1	stubble burnt
Heenan et al. 2004	6	6			19.37	20.75	CT	DD	3	0.33		0.107	13	11-20	0-10		0-10	29 (0-10 cm)	red earth; Chromic Luvisol	sub. clover-wheat	Wagga Wagga	NSW	Fig. 1	stubble retained
Heenan et al. 2004	6	6			18.15	19.42	CT	DD	3	0.33		0.079	16	11-20	0-10		0-10	29 (0-10 cm)	red earth; Chromic Luvisol	lupin-WW	Wagga Wagga	NSW	Fig. 1	stubble retained
Heenan et al. 2004	6	6			16.83	17.40	CT	DD	3	0.33		0.036	16	11-20	0-10		0-10	29 (0-10 cm)	red earth; Chromic Luvisol	lupin-WW	Wagga Wagga	NSW	Fig. 1	stubble burnt

Heenan et al. 2004	6	6			18.56	22.02	CT	DD	3	0.33		0.216	16	11-20	0-10		0-10	29 (0-10 cm)	red earth; Chromic Luvisol	sub. clover-wheat	Wagga Wagga	NSW	Fig. 1	stubble retained
Heenan et al. 2004	6	6			17.29	19.71	CT	DD	3	0.33		0.115	21	21-30	0-10		0-10	29 (0-10 cm)	red earth; Chromic Luvisol	lupin-WW	Wagga Wagga	NSW	Fig. 1	stubble retained
Heenan et al. 2004	6	6			15.10	19.71	CT	DD	3	0.33		0.220	21	21-30	0-10		0-10	29 (0-10 cm)	red earth; Chromic Luvisol	lupin-WW	Wagga Wagga	NSW	Fig. 1	stubble burnt
Heenan et al. 2004	6	6			21.73	22.19	CT	DD	3	0.33		0.022	21	21-30	0-10		0-10	29 (0-10 cm)	red earth; Chromic Luvisol	sub. clover-wheat	Wagga Wagga	NSW	Fig. 1	stubble retained
Hulugalle 2000	4	4			86.299	88.729	CT	RT	2	0.50		0.187	13	11-20	0-60			53; 60 (0-30 cm; 30-60 cm	thermic, montmorillonitic, Typic Haplustert	CttnCttn	Narrabri	NSW	Fig. 1	
Hulugalle and Entwistle 1997	4	4	1.75	1.95			CT	RT	2	0.50	0.108		9	0-10	0-15	0-10		53; 60 (0-30 cm; 30-60 cm	grey clay; Typic Pellustert	CttnCttn	Narrabri	NSW	Table 2	
Hulugalle and Entwistle 1997	4	4	1.40	1.41			CT	RT	2	0.50	0.007		9	0-10	15-30	20-30		53; 60 (0-30 cm; 30-60 cm	grey clay; Typic Pellustert	CttnCttn	Narrabri	NSW	Table 2	
Hulugalle and Entwistle 1997	4	4	1.04	1.12			CT	RT	2	0.50	0.074		9	0-10	30-45	30-40		53; 60 (0-30 cm; 30-60 cm	grey clay; Typic Pellustert	CttnCttn	Narrabri	NSW	Table 2	
Hulugalle and Entwistle 1997	4	4	1.03	1.09			CT	RT	2	0.50	0.057		9	0-10	45-60	> 40		53; 60 (0-30 cm; 30-60 cm	grey clay; Typic Pellustert	CttnCttn	Narrabri	NSW	Table 2	
Hulugalle et al. 2005	4	4	0.83	1.05			CT	RT	2	0.50	0.236		16	11-20	0-15	0-10		53; 60 (0-30 cm; 30-60 cm	thermic, montmorillonitic, Typic Haplustert	CttnCttn	Narrabri	NSW	Table 1	
Li et al. 2011	3	3	1.11	1.52			CT	DD	1.5	0.67	0.314		26	21-30	0-5	0-10		29 (0-10 cm)	red earth (Oxic Paleustalf)	wheat-lupin	Wagga Wagga	NSW	Table 3	stubble retention
Li et al. 2011	3	3	0.96	1.52			CT	DD	1.5	0.67	0.460		26	21-30	0-5	0-10		29 (0-10 cm)	red earth (Oxic Paleustalf)	wheat-lupin	Wagga Wagga	NSW	Table 3	stubble burnt
Loch and Coughlan 1984	4	4	1.60	1.59	16.03	15.94	CT	NT	2	0.50	-0.006	-0.019	5	0-10	0-10	0-10	0-10	70 (0-10 cm)	black, cracking clay (Udic Pellustert)	WW	Warwick	QLD	Table 2	stubble burnt
Loch and Coughlan 1984	4	4	1.67	1.72	16.68	17.14	CT	NT	2	0.50	0.030	0.093	5	0-10	0-10	0-10	0-10	70 (0-10 cm)	black, cracking clay (Udic Pellustert)	WW	Warwick	QLD	Table 2	stubble retained
Murphy et al. 2011	3	3	1.29	1.39			CT	NT	1.5	0.67	0.078		5	0-10	0-5	0-10		25 (A horizon)	sandy clay loam	faba beans-wheat-canola-wheat-field pea	Gnowangerup	WA	Table 3	
Murphy et al. 2011	3	3	1.64	1.74			CT	NT	1.5	0.67	0.054		5	0-10	0-5	0-10		25 (A horizon)	sandy clay loam	medic-wheat-medic-wheat-medic	Gnowangerup	WA	Table 3	
Packer et al. 1992	1	1	0.54	0.80	9.10	12.43	CT	RT	0.5	2.00	0.386	0.830	4	0-10	0-10	0-10	0-10	8 (surface)	red duplex soil; Xeralfic alfisol	WW	Cowra	NSW	Fig. 9a	
Packer et al. 1992	1	1	0.54	0.87	9.10	14.22	CT	DD	0.5	2.00	0.476	1.279	4	0-10	0-10	0-10	0-10	8 (surface)	red duplex soil; Xeralfic alfisol	WW	Cowra	NSW	Fig. 9a	
Packer et al. 1992	1	1	0.56	0.82	9.37	12.46	CT	RT	0.5	2.00	0.379	0.441	7	0-10	0-10	0-10	0-10	8 (surface)	red duplex soil; Xeralfic alfisol	WW	Cowra	NSW	Fig. 9a	
Packer et al. 1992	1	1	0.56	0.86	9.37	13.60	CT	DD	0.5	2.00	0.426	0.604	7	0-10	0-10	0-10	0-10	8 (surface)	red duplex soil; Xeralfic alfisol	WW	Cowra	NSW	Fig. 9a	
Packer et al. 1992	1	1	1.24	1.50	17.47	21.06	CT	RT	0.5	2.00	0.187	1.195	3	0-10	0-10	0-10	0-10	14 (0-10 cm)	yellow duplex; Xeralfic alfisol	WW	Grenfell	NSW	Fig. 9b	
Packer et al. 1992	1	1	1.24	1.37	17.47	20.29	CT	DD	0.5	2.00	0.099	0.939	3	0-10	0-10	0-10	0-10	14 (0-10 cm)	yellow duplex; Xeralfic alfisol	WW	Grenfell	NSW	Fig. 9b	
Packer et al. 1992	1	1	1.20	1.51	17.04	20.83	CT	RT	0.5	2.00	0.229	0.631	6	0-10	0-10	0-10	0-10	14 (0-10 cm)	yellow duplex; Xeralfic alfisol	WW	Grenfell	NSW	Fig. 9b	
Packer et al. 1992	1	1	1.20	1.24	17.04	17.21	CT	DD	0.5	2.00	0.029	0.028	6	0-10	0-10	0-10	0-10	14 (0-10 cm)	yellow duplex; Xeralfic alfisol	WW	Grenfell	NSW	Fig. 9b	
Radford and Thornton 2011	4	4	1.37	1.54			CT	RT	2	0.50	0.117		20	11-20	0-10	0-10			Vertisol/Aridisol	wheat/sorghum	Biloela	QLD	Table 2	
Radford and Thornton 2011	4	4	1.29	1.35			CT	RT	2	0.50	0.045		20	11-20	10-20	10-20			Vertisol/Aridisol	wheat/sorghum	Biloela	QLD	Table 2	
Radford and Thornton 2011	4	4	1.37	1.61			CT	NT	2	0.50	0.161		20	11-20	0-10	0-10			Vertisol/Aridisol	wheat/sorghum	Biloela	QLD	Table 2	
Radford and Thornton 2011	4	4	1.29	1.41			CT	NT	2	0.50	0.089		20	11-20	10-20	10-20			Vertisol/Aridisol	wheat/sorghum	Biloela	QLD	Table 2	
Roper et al. 2010	3	3			15.65	15.29	CT	NT	1.5	0.67		-0.122	3	0-10	0-10		0-10		Orthic Regolith Tenosol	wheat-lupin	Wongan Hills	WA	Fig. 2	
Roper et al. 2010	3	3			15.65	16.37	CT	RT	1.5	0.67		0.239	3	0-10	0-10		0-10		Orthic Regolith Tenosol	wheat-lupin	Wongan Hills	WA	Fig. 2	
Roper et al. 2010	3	3			15.63	17.67	CT	NT	1.5	0.67		0.340	6	0-10	0-10		0-10		Orthic Regolith Tenosol	wheat-lupin	Wongan Hills	WA	Fig. 2	
Roper et al. 2010	3	3			15.63	17.63	CT	RT	1.5	0.67		0.334	6	0-10	0-10		0-10		Orthic Regolith Tenosol	wheat-lupin	Wongan Hills	WA	Fig. 2	
Saffigna et al. 1989	4	4	1.21	1.29	13.97	14.85	CT	NT	2	0.50	0.064	0.147	6	0-10	0-10	0-10	0-10	41	Vertisol; Entic Pellustert	SgSg	Biloela	QLD	Table 1	no residue
Saffigna et al. 1989	4	4	1.30	1.39	14.96	15.94	CT	NT	2	0.50	0.067	0.164	6	0-10	0-10	0-10	0-10	41	Vertisol; Entic Pellustert	SgSg	Biloela	QLD	Table 1	with residue
Smettem et al. 1992	5	5	1.44	1.80			CT	DD	2.5	0.40	0.223		5	0-10	0-5	0-10		11 (0-10cm)	red-brown earth; Calcic Luvisol	WW	Kapunda	SA	Table 4	lupin stubble retained
Smettem et al. 1992	5	5	1.55	1.93			CT	DD	2.5	0.40	0.219		5	0-10	0-5	0-10		11 (0-10cm)	red-brown earth; Calcic Luvisol	wheat/pasture	Kapunda	SA	Table 4	lupin stubble retained
Smettem et al. 1992	5	5	1.48	1.78			CT	DD	2.5	0.40	0.185		5	0-10	0-5	0-10		11 (0-10cm)	red-brown earth; Calcic Luvisol	wheat/lupin	Kapunda	SA	Table 4	lupin stubble retained
Standley et al. 1990	4	4			11.12	12.07	CT	NT	2	0.50		0.136	7	0-10	0-10		0-10	41	Vertisol; Entic Pellustert	SgSg	Biloela	QLD	Fig. 1	no residue
Standley et al. 1990	4	4			11.56	12.73	CT	NT	2	0.50		0.167	7	0-10	0-10		0-10	41	Vertisol; Entic Pellustert	SgSg	Biloela	QLD	Fig. 1	with residue
Standley et al. 1990	4	4			11.12	11.11	CT	RT	2	0.50		-0.001	7	0-10	0-10		0-10	41	Vertisol; Entic Pellustert	SgSg	Biloela	QLD	Fig. 1	no residue
Standley et al. 1990	4	4			11.56	12.13	CT	RT	2	0.50		0.081	7	0-10	0-10		0-10	41	Vertisol; Entic Pellustert	SgSg	Biloela	QLD	Fig. 1	with residue
Thomas et al. 2007	3	3	0.79	0.92	10.93	12.02	CT	RT	1.5	0.67	0.147	0.121	9	0-10	0-10	0-10	0-10	27 (0-10 cm)	Luvisol	WW	Goondiwindi	QLD	Table 2	
Thomas et al. 2007	3	3	0.65	0.65	9.66	9.99	CT	RT	1.5	0.67	0.003	0.037	9	0-10	10-20	10-20	10-20	27 (0-10 cm)	Luvisol	WW	Goondiwindi	QLD	Table 2	
Thomas et al. 2007	3	3	0.52	0.54	7.91	8.32	CT	RT	1.5	0.67	0.034	0.046	9	0-10	20-30	20-30	20-30	27 (0-10 cm)	Luvisol	WW	Goondiwindi	QLD	Table 2	
Thomas et al. 2007	3	3	0.79	0.89	10.93	12.87	CT	NT	1.5	0.67	0.121	0.216	9	0-10	0-10	0-10	0-10	27 (0-10 cm)	Luvisol	WW	Goondiwindi	QLD	Table 2	
Thomas et al. 2007	3	3	0.65	0.61	9.66	9.40	CT	NT	1.5	0.67	-0.066	-0.029	9	0-10	10-20	10-20	10-20	27 (0-10 cm)	Luvisol	WW	Goondiwindi	QLD	Table 2	
Thomas et al. 2007	3	3	0.52	0.54	7.91	8.26	CT	NT	1.5	0.67	0.044	0.039	9	0-10	20-30	20-30	20-30	27 (0-10 cm)	Luvisol	WW	Goondiwindi	QLD	Table 2	
van Gestel et al. 1992	6	6	1.73	1.88			CT	RT	3	0.33	0.079		5	0-10	0-7.5	0-10		10 (0-10 cm)	Alfisol	wheat-pasture (subterraneum clover and wall barley)	Kapunda	SA	Table 4	
Vu et al. 2009	3	3	1.11	1.30	13.04	15.17	CT	NT	1.5	0.67	0.159	0.267	8	0-10	0-10	0-10	0-10	37 (0-10 cm)	Vertosol	canola-wheat-lucerne	Longerenong	VIC	Fig. 2	
Vu et al. 2009	3	3	0.93	1.01	10.99	11.94	CT	NT	1.5	0.67	0.085	0.118	8	0-10	10-20	10-20	10-20	37 (0-10 cm)	Vertosol	canola-wheat-lucerne	Longerenong	VIC	Fig. 2	
Vu et al. 2009	3	3	0.82	0.84	9.77	10.03	CT	NT	1.5	0.67	0.027	0.032	8	0-10	20-30	20-30	20-30	37 (0-10 cm)	Vertosol	canola-wheat-lucerne	Longerenong	VIC	Fig. 2	
Vu et al. 2009	3	3	0.79	0.83	9.36	9.92	CT	NT	1.5	0.67	0.060	0.070	8	0-10	30-40	30-40	30-40	37 (0-10 cm)	Vertosol	canola-wheat-lucerne	Longerenong	VIC	Fig. 2	
Vu et al. 2009	3	3	1.11	1.23	13.04	14.39	CT	RT	1.5	0.67	0.103	0.169	8	0-10	0-10	0-10	0-10	37 (0-10 cm)	Vertosol	canola-wheat-lucerne	Longerenong	VIC	Fig. 2	
Vu et al. 2009	3	3	0.93	0.98	10.99	11.59	CT	RT	1.5	0.67	0.055	0.075	8	0-10	10-20	10-20	10-20	37 (0-10 cm)	Vertosol	canola-wheat-lucerne	Longerenong	VIC	Fig. 2	
Vu et al. 2009	3	3	0.82	0.84	9.77	9.93	CT	RT	1.5	0.67	0.017	0.020	8	0-10	20-30	20-30	20-30	37 (0-10 cm)	Vertosol	canola-wheat-lucerne	Longerenong	VIC	Fig. 2	
Vu et al. 2009	3	3	0.79	0.86	9.36	10.22	CT	RT	1.5	0.67	0.091	0.108	8	0-10	30-40	30-40	30-40	37 (0-10 cm)	Vertosol	canola-wheat-lucerne	Longerenong	VIC	Fig. 2	
Vu et al. 2009	3	3	1.00	0.97	12.62	12.25	CT	DD	1.5	0.67	-0.029	-0.015	25	21-30	0-10	0-10	0-10	20 (0-10 cm)	Chromosol	wheat-faba bean	Rutherglen	NSW	Fig. 2	stubble burnt
Vu et al. 2009	3	3	0.48	0.48	6.13	6.13	CT	DD	1.5	0.67	0.000	0.000	25	21-30	10-20	10-20	10-20	20 (0-10 cm)	Chromosol	wheat-faba bean	Rutherglen	NSW	Fig. 2	stubble burnt
Vu et al. 2009	3	3	0.38	0.44	4.92	5.62	CT	DD	1.5	0.67	0.135	0.028	25	21-30	20-30	20-30	20-30	20 (0-10 cm)	Chromosol	wheat-faba bean	Rutherglen	NSW	Fig. 2	stubble burnt
Vu et al. 2009	3	3	0.24	0.26	3.14	3.32	CT	DD	1.5	0.67	0.055	0.007	25	21-30	30-40	30-40	30-40	20 (0-10 cm)	Chromosol	wheat-faba bean	Rutherglen	NSW	Fig. 2	stubble burnt
Vu et al. 2009	3	3	0.53	0.54	7.10	7.23	CT	DD	1.5	0.67	0.019	0.006	23	21-30	0-10	0-10	0-10	8 (0-10 cm)	Calcarosol	wheat-barrel medic	Walpeup	VIC	Fig. 2	
Vu et al. 2009	3	3	0.43	0.43	5.73	5.73	CT	DD	1.5	0.67	0.000	0.000	23	21-30	10-20	10-20	10-20	8 (0-10 cm)	Calcarosol	wheat-barrel medic	Walpeup	VIC	Fig. 2	
Vu et al. 2009	3	3	0.40	0.38	5.36	5.09	CT	DD	1.5	0.67	-0.053	-0.012	23	21-30	20-30	20-30	20-30	8 (0-10 cm)	Calcarosol	wheat-barrel medic	Walpeup	VIC	Fig. 2	
Vu et al. 2009	3	3	0.35	0.36	4.67	4.83	CT	DD	1.5	0.67	0.035	0.007	23	21-30	30-40	30-40	30-40	8 (0-10 cm)	Calcarosol	wheat-barrel medic	Walpeup	VIC	Fig. 2	
Vu et al. 2009	3	3	0.43	0.45	5.83	6.04	CT	DD	1.5	0.67	0.037	0.009	23	21-30	0-10	0-10	0-10	8 (0-10 cm)	Calcarosol	wheat-barrel medic-fallow	Walpeup	VIC	Fig. 2	
Vu et al. 2009	3	3	0.31	0.33	4.20	4.48	CT	DD	1.5	0.67	0.064	0.012	23	21-30	10-20	10-20	10-20	8 (0-10 cm)	Calcarosol	wheat-barrel medic-fallow	Walpeup	VIC	Fig. 2	
Vu et al. 2009	3	3	0.38	0.34	5.09	4.63	CT	DD	1.5	0.67	-0.097	-0.020	23	21-30	20-30	20-30	20-30	8 (0-10 cm)	Calcarosol	wheat-barrel medic-fallow	Walpeup	VIC	Fig. 2	
Vu et al. 2009	3	3	0.36	0.34	4.86	4.61	CT	DD	1.5	0.67	-0.053	-0.011	23	21-30	30-40	30-40	30-40	8 (0-10 cm)	Calcarosol	wheat-barrel medic-fallow	Walpeup	VIC	Fig. 2	
Wang and Dalal 2006	4	4			20.30	19.60	CT	NT	2	0.50		-0.021	33	31-40	0-10		0-10	65	Vertisol	WW or BlyBly	Warwick	QLD	Table 1	stubble burnt
Wang and Dalal 2006	4	4			20.70	20.80	CT	NT	2	0.50		0.003	33	31-40	0-10		0-10	65	Vertisol	WW or BlyBly	Warwick	QLD	Table 1	stubble retained
Wang and Dalal 2006	4	4			19.90	20.20	CT	NT	2	0.50		0.009	33	31-40	0-10		0-10	65	Vertisol	WW or BlyBly	Warwick	QLD	Table 1	stubble burnt
Wang and Dalal 2006	4	4			20.30	22.00	CT	NT	2	0.50		0.052	33	31-40	0-10		0-10	65	Vertisol	WW or BlyBly	Warwick	QLD	Table 1	stubble retained
Wang and Dalal 2006	4	4			19.40	19.30	CT	NT	2	0.50		-0.003	33	31-40	10-20		10-20	65	Vertisol	WW or BlyBly	Warwick	QLD	Table 1	stubble burnt
Wang and Dalal 2006	4	4			20.10	20.10	CT	NT	2	0.50		0.000	33	31-40	10-20		10-20	65	Vertisol	WW or BlyBly	Warwick	QLD	Table 1	stubble retained
Wang and Dalal 2006	4	4			19.50	19.10	CT	NT	2	0.50		-0.012	33	31-40	10-20		10-20	65	Vertisol	WW or BlyBly	Warwick	QLD	Table 1	stubble burnt
Wang and Dalal 2006	4	4			19.50	20.00	CT	NT	2	0.50		0.015	33	31-40	10-20		10-20	65	Vertisol	WW or BlyBly	Warwick	QLD	Table 1	stubble retained
White 1990	6	6	0.60	0.61			CT	RT	3	0.33	0.022		3	0-10	0-15	0-10		10 (0-10 cm)	yellow earthy sand	WW	Wongan Hills	WA	Table 5	
White 1990	6	6	0.28	0.30			CT	RT	3	0.33	0.069		3	0-10	15-25	10-20				WW	Wongan Hills	WA	Table 5	
White 1990	6	6	0.55	0.61			CT	RT	3	0.33	0.104		6	0-10	0-15	0-10		10 (0-10 cm)	yellow earthy sand	WW	Wongan Hills	WA	Table 5	
White 1990	6	6	0.39	0.40			CT	RT	3	0.33	0.025		6	0-10	15-25	10-20				WW	Wongan Hills	WA	Table 5	
White 1990	6	6	0.50	0.57			CT	RT	3	0.33	0.132		9	0-10	0-15	0-10		10 (0-10 cm)	yellow earthy sand	WW	Wongan Hills	WA	Table 5	
White 1990	6	6	0.32	0.29			CT	RT	3	0.33	-0.098		9	0-10	15-25	10-20				WW	Wongan Hills	WA	Table 5	

White 1990	6	6	0.71	0.79	CT	RT	3	0.33	0.102	3	0-10	0-15	0-10	20 (0-10 cm)	calcic, red-brown earth	WW	Merredin	WA	Table 6
White 1990	6	6	0.47	0.50	CT	RT	3	0.33	0.062	3	0-10	15-25	10-20			WW	Merredin	WA	Table 6
White 1990	6	6	0.77	0.83	CT	RT	3	0.33	0.083	6	0-10	0-15	0-10	20 (0-10 cm)	calcic, red-brown earth	WW	Merredin	WA	Table 6
White 1990	6	6	0.46	0.47	CT	RT	3	0.33	0.022	6	0-10	15-25	10-20			WW	Merredin	WA	Table 6
White 1990	6	6	0.69	0.78	CT	RT	3	0.33	0.123	9	0-10	0-15	0-10	20 (0-10 cm)	calcic, red-brown earth	WW	Merredin	WA	Table 6
White 1990	6	6	0.44	0.65	CT	RT	3	0.33	0.390	9	0-10	15-25	10-20			WW	Merredin	WA	Table 6
White 1990	6	6	1.26	1.24	CT	RT	3	0.33	-0.016	3	0-10	0-15	0-10	16 (0-10 cm)	non-calcic, brown earth	WW	Avondale	WA	Table 7
White 1990	5	5	0.89	0.72	CT	RT	2.5	0.40	-0.212	3	0-10	15-25	10-20			WW	Avondale	WA	Table 7
White 1990	6	6	1.22	1.27	CT	RT	3	0.33	0.043	6	0-10	0-15	0-10	16 (0-10 cm)	non-calcic, brown earth	WW	Avondale	WA	Table 7
White 1990	5	5	0.74	0.65	CT	RT	2.5	0.40	-0.130	6	0-10	15-25	10-20			WW	Avondale	WA	Table 7
White 1990	6	6	1.14	1.20	CT	RT	3	0.33	0.054	9	0-10	0-15	0-10	16 (0-10 cm)	non-calcic, brown earth	WW	Avondale	WA	Table 7
White 1990	5	5	0.66	0.67	CT	RT	2.5	0.40	0.015	9	0-10	15-25	10-20			WW	Avondale	WA	Table 7

CT: conventional tillage
DD: direct drill
NT: no tillage
RT: reduced tillage

WW-wheat-wheat
Bly-barley
Sg-sorghum
Cttn-cotton

Supplementary Table S2 Studies used in the meta-analysis on the effect of residue retention on soil C

	n	*n*	Mean values				Practice			ln *r*	*U*	Experimental duration	Soil sampling depth								
			Soil C (%)		Soil C (Mg ha^{-1})																
Citation	control	treatment	control (CT)	treatment	control	treatment	control	treatment	weight	variance	%C	C stock (Mg C ha^{-1} year^{-1})	No. of years	category	depth (cm)	category for %C	category for C stock	% clay	soil type	Species	Location	State	Description of data source	Other treatment
Blair 2000	4	4	1.21	1.06	15.31	13.39	burnt residue	with residue	2	0.50	-0.140	-0.481	4	0-10	0-10	0-10	0-10	18	non-calcic brown soil (Chromic Luvisol)	sugar cane	Mackay	QLD	Table 1	average of CT and NT
Blair et al. 1998	5	5	1.06	1.08	12.30	12.51	burnt residue	with residue	2.5	0.40	0.020	0.027	8	0-10	0-10	0-10	0-10	40	alluvial soil	sugar cane-sugar cane	Ayr	QLD	Table 3	
Blair et al. 1998	5	5	0.91	0.81			burnt residue	with residue	2.5	0.40	-0.116		8	0-10	10-25	10-20		40	alluvial soil	sugar cane-sugar cane	Ayr	QLD	Table 3	
Blair et al. 1998	3	3			32.15	37.75	burnt residue	with residue	1.5	0.67		1.120	5	0-10	0-25			39	Typic Tropaquept soil	sugar cane-sugar cane	Tully	QLD	Table 1	
Bünemann et al. 2008	3	3	1.21	1.39			burnt residue	residue incorporated	1.5	0.67	0.139		26	21-30	0-5	0-10		29 (0-10 cm)	red earth (Chromic Luvisol)	wheat-lupin	Wagga Wagga	NSW	Table 2	
Carter and Mele 1992	8	8	1.19	1.18			burnt residue	with residue	4	0.25	-0.013		10	0-10	0-2.5	0-10		22 (0-10 cm)	calcic Luvisol	WW for 5 years	Rutherglen	VIC	Table 1	DD
Chan and Heelan 2005	3	3	1.91	1.83			burnt residue	with residue	1.5	0.67	-0.043		5	0-10	0-5	0-10		15 (0-20 cm)	Alfisol; red-brown earth	WW-lupin	Temora	NSW	Table 2	NT
Chan and Heelan 2005	3	3	1.60	1.55			burnt residue	with residue	1.5	0.67	-0.032		5	0-10	0-5	0-10		15 (0-20 cm)	Alfisol; red-brown earth	WW-lupin	Temora	NSW	Table 2	CT
Chan and Heelan 2005	3	3			23.00	22.30	burnt residue	with residue	1.5	0.67		-0.140	5	0-10	0-10		0-10	15 (0-20 cm)	Alfisol; red-brown earth	WW-lupin	Temora	NSW	Table 3	NT
Chan and Heelan 2005	3	3			20.90	20.50	burnt residue	with residue	1.5	0.67		-0.080	5	0-10	0-10		0-10	15 (0-20 cm)	Alfisol; red-brown earth	WW-lupin	Temora	NSW	Table 3	CT
Chan and Heelan 2005	3	3			24.10	25.40	burnt residue	with residue	1.5	0.67		0.068	19	11-20	0-10		0-10	27 (0-20 cm)	Chromic Luvisol; red earth	WW-lupin	Wagga Wagga	NSW	Table 3	NT
Chan and Heelan 2005	3	3			17.70	19.90	burnt residue	with residue	1.5	0.67		0.116	19	11-20	0-10		0-10	27 (0-20 cm)	Chromic Luvisol; red earth	WW-lupin	Wagga Wagga	NSW	Table 3	CT
Chan and Heelan 2005	3	3	1.55	1.69			burnt residue	with residue	1.5	0.67	0.082		19	11-20	0-10	0-10		27 (0-20 cm)	Chromic Luvisol; red earth	WW-lupin	Wagga Wagga	NSW	Fig. 1	average of CT and NT
Chan and Heelan 2005	3	3	0.80	0.82	9.91	10.11	burnt residue	with residue	1.5	0.67	0.022	0.011	19	11-20	10-20	10-20	10-20	27 (0-20 cm)	Chromic Luvisol; red earth	WW-lupin	Wagga Wagga	NSW	Fig. 1	average of CT and NT
Chan et al. 1992	6	6	1.89	2.17			burnt residue	residue retained	3	0.33	0.139		10	0-10	0-10	0-10		27 (0-20 cm)	red earth	WW-lupin	Wagga Wagga	NSW	Fig. 1	average of CT, RT and NT
Chan et al. 1992	6	6	1.00	1.12			burnt residue	residue retained	3	0.33	0.115		10	0-10	10-20	10-20		27 (0-20 cm)	red earth	WW-lupin	Wagga Wagga	NSW	Fig. 1	average of CT, RT and NT
Chan et al. 1992	6	6			25.54	28.81	burnt residue	residue retained	3	0.33		0.327	10	0-10	0-10		0-10	27 (0-20 cm)	red earth	WW-lupin	Wagga Wagga	NSW	Table 3	average of CT, RT and NT
Chan et al. 1992	6	6			15.53	17.32	burnt residue	residue retained	3	0.33		0.179	10	0-10	10-20		10-20	27 (0-20 cm)	red earth	WW-lupin	Wagga Wagga	NSW	Table 3	average of CT, RT and NT
Chan et al. 2002	6	6	1.77	1.87	21.11	22.20	burnt residue	residue retained	3	0.33	0.055	0.057	19	11-20	0-10	0-10	0-10	27 (0-20 cm)	red earth (Oxic Paleustalf)	WW-lupin	Wagga Wagga	NSW	Fig. 1	direct drill
Chan et al. 2002	6	6	0.83	0.83	10.27	10.23	burnt residue	residue retained	3	0.33	-0.004	-0.002	19	11-20	10-20	10-20	10-20	27 (0-20 cm)	red earth (Oxic Paleustalf)	WW-lupin	Wagga Wagga	NSW	Fig. 1	direct drill
Chan et al. 2002	6	6	1.34	1.50	16.28	18.15	burnt residue	residue retained	3	0.33	0.114	0.098	19	11-20	0-10	0-10	0-10	27 (0-20 cm)	red earth (Oxic Paleustalf)	WW-lupin	Wagga Wagga	NSW	Fig. 1	CT
Chan et al. 2002	6	6	0.72	0.86	8.90	10.61	burnt residue	residue retained	3	0.33	0.181	0.090	19	11-20	10-20	10-20	10-20	27 (0-20 cm)	red earth (Oxic Paleustalf)	WW-lupin	Wagga Wagga	NSW	Fig. 1	CT
Conteh et al. 1998	4	4	1.01	1.11	45.36	49.95	burnt residue	residue incorporated	2	0.50	0.096	1.530	3	0-10	0-30			60	Typic Pellustert; grey cracking clay	Cotton-cotton	Narrabri	NSW	Table 1	RT; mean of multiple N treatments
Dalal 1989	4	4	1.66	1.71	16.98	17.45	burnt residue	residue retained	2	0.50	0.030	0.037	13	11-20	0-10	0-10	0-10	65	Vertisol (Hermitage clay)	WW or Bly Bly	Warwick	QLD	Table 2	CT
Dalal 1989	4	4	1.68	1.74	17.17	17.74	burnt residue	residue retained	2	0.50	0.035	0.044	13	11-20	0-10	0-10	0-10	65	Vertisol (Hermitage clay)	WW or Bly Bly	Warwick	QLD	Table 2	CT
Dalal 1989	4	4	1.76	1.79	17.93	18.21	burnt residue	residue retained	2	0.50	0.017	0.022	13	11-20	0-10	0-10	0-10	65	Vertisol (Hermitage clay)	WW or Bly Bly	Warwick	QLD	Table 2	CT
Dalal 1989	4	4	1.70	1.72	17.36	17.55	burnt residue	residue retained	2	0.50	0.012	0.015	13	11-20	0-10	0-10	0-10	65	Vertisol (Hermitage clay)	WW or Bly Bly	Warwick	QLD	Table 2	NT
Dalal 1989	4	4	1.60	1.92	16.40	19.43	burnt residue	residue retained	2	0.50	0.182	0.233	13	11-20	0-10	0-10	0-10	65	Vertisol (Hermitage clay)	WW or Bly Bly	Warwick	QLD	Table 2	NT
Dalal 1989	4	4	1.67	1.94	17.07	19.61	burnt residue	residue retained	2	0.50	0.150	0.195	13	11-20	0-10	0-10	0-10	65	Vertisol (Hermitage clay)	WW or Bly Bly	Warwick	QLD	Table 2	NT
Dalal et al. 1991	4	4	1.75	1.76	17.83	17.93	burnt residue	residue retained	2	0.50	0.006	0.005	20	11-20	0-10	0-10	0-10	65	Vertisol (Hermitage clay)	WW or Bly Bly	Warwick	QLD	Table 1	CT
Dalal et al. 1991	4	4	1.77	1.79	18.02	18.21	burnt residue	residue retained	2	0.50	0.011	0.009	20	11-20	0-10	0-10	0-10	65	Vertisol (Hermitage clay)	WW or Bly Bly	Warwick	QLD	Table 1	CT
Dalal et al. 1991	4	4	1.77	1.87	18.02	18.96	burnt residue	residue retained	2	0.50	0.055	0.047	20	11-20	0-10	0-10	0-10	65	Vertisol (Hermitage clay)	WW or Bly Bly	Warwick	QLD	Table 1	CT
Dalal et al. 1991	4	4	1.65	1.77	16.88	18.02	burnt residue	residue retained	2	0.50	0.070	0.057	20	11-20	0-10	0-10	0-10	65	Vertisol (Hermitage clay)	WW or Bly Bly	Warwick	QLD	Table 1	NT
Dalal et al. 1991	4	4	1.65	1.81	16.88	18.40	burnt residue	residue retained	2	0.50	0.093	0.076	20	11-20	0-10	0-10	0-10	65	Vertisol (Hermitage clay)	WW or Bly Bly	Warwick	QLD	Table 1	NT
Dalal et al. 1991	4	4	1.76	1.83	17.93	18.59	burnt residue	residue retained	2	0.50	0.039	0.033	20	11-20	0-10	0-10	0-10	65	Vertisol (Hermitage clay)	WW or Bly Bly	Warwick	QLD	Table 1	NT
Dalal et al. 2011	4	4			19.46	19.64	burnt residue	residue retained	2	0.50		0.004	40	31-40	0-10		0-10	65 (0-10 cm)	Vertisol (black self-mulching cracking clay; Ustic Pellustert)	WW or BlyBly	Warwick	QLD	Fig. 1	average of CT and NT
Dalal et al. 2011	4	4			19.64	20.67	burnt residue	residue retained	2	0.50		0.026	40	31-40	0-10		0-10	65 (0-10 cm)	Vertisol (black self-mulching cracking clay; Ustic Pellustert)	WW or BlyBly	Warwick	QLD	Fig. 1	average of CT and NT
Dalal et al. 2011	4	4			19.57	21.26	burnt residue	residue retained	2	0.50		0.042	40	31-40	0-10		0-10	65 (0-10 cm)	Vertisol (black self-mulching cracking clay; Ustic Pellustert)	WW or BlyBly	Warwick	QLD	Fig. 1	average of CT and NT
Dalal et al. 2011	4	4			21.18	20.49	burnt residue	residue retained	2	0.50		-0.017	40	31-40	10-20		10-20	65 (0-10 cm)	Vertisol (black self-mulching cracking clay; Ustic Pellustert)	WW or BlyBly	Warwick	QLD	Fig. 1	average of CT and NT
Dalal et al. 2011	4	4			21.17	20.92	burnt residue	residue retained	2	0.50		-0.006	40	31-40	10-20		10-20	65 (0-10 cm)	Vertisol (black self-mulching cracking clay; Ustic Pellustert)	WW or BlyBly	Warwick	QLD	Fig. 1	average of CT and NT
Dalal et al. 2011	4	4			20.57	21.30	burnt residue	residue retained	2	0.50		0.018	40	31-40	10-20		10-20	65 (0-10 cm)	Vertisol (black self-mulching cracking clay; Ustic Pellustert)	WW or BlyBly	Warwick	QLD	Fig. 1	average of CT and NT
Dalal et al. 2011	4	4			21.59	21.10	burnt residue	residue retained	2	0.50		-0.012	40	31-40	20-30		20-30	65 (0-10 cm)	Vertisol (black self-mulching cracking clay; Ustic Pellustert)	WW or BlyBly	Warwick	QLD	Fig. 1	average of CT and NT
Dalal et al. 2011	4	4			21.44	21.42	burnt residue	residue retained	2	0.50		-0.001	40	31-40	20-30		20-30	65 (0-10 cm)	Vertisol (black self-mulching cracking clay; Ustic Pellustert)	WW or BlyBly	Warwick	QLD	Fig. 1	average of CT and NT
Dalal et al. 2011	4	4			21.08	21.68	burnt residue	residue retained	2	0.50		0.015	40	31-40	20-30		20-30	65 (0-10 cm)	Vertisol (black self-mulching cracking clay; Ustic Pellustert)	WW or BlyBly	Warwick	QLD	Fig. 1	average of CT and NT
Fettell and Gill 1995	4	4	0.95	0.96	11.78	11.84	burnt residue	with residue	2	0.50	0.005	0.004	15	11-20	0-10	0-10	0-10	25	red-brown earth	WW	Condobolin	NSW	Table 3	CT
Fettell and Gill 1995	4	4	0.94	0.97	11.66	11.96	burnt residue	with residue	2	0.50	0.026	0.020	15	11-20	0-10	0-10	0-10	25	red-brown earth	WW	Condobolin	NSW	Table 3	DD
Fettell and Gill 1995	4	4	0.95	0.96	11.78	11.84	burnt residue	residue incorporated	2	0.50	0.005	0.004	15	11-20	0-10	0-10	0-10	25	red-brown earth	WW	Condobolin	NSW	Table 3	CT
Haines and Uren 1990	8	8	0.94	0.96			burnt residue	residue retained	4	0.25	0.021		5	0-10	0-7.5	0-10		20 (surface)	solodic (sandy clay loam)	WW	Rutherglen	VIC	Table 2	DD
Haines and Uren 1990	8	8	0.52	0.50			burnt residue	residue retained	4	0.25	-0.039		5	0-10	7.5-25	10-20		20 (surface)	solodic (sandy clay loam)	WW	Rutherglen	VIC	Table 2	DD
Heenan et al. 2004	6	6			19.25	18.85	burnt residue	with residue	3	0.33		-0.067	6	0-10	0-10		0-10	29 (0-10 cm)	red earth; Chromic Luvisol	lupin-WW	Wagga Wagga	NSW	Fig. 1	DD
Heenan et al. 2004	6	6			20.12	19.37	burnt residue	with residue	3	0.33		-0.125	6	0-10	0-10		0-10	29 (0-10 cm)	red earth; Chromic Luvisol	lupin-WW	Wagga Wagga	NSW	Fig. 1	CT
Heenan et al. 2004	6	6			18.38	19.42	burnt residue	with residue	3	0.33		0.080	13	11-20	0-10		0-10	29 (0-10 cm)	red earth; Chromic Luvisol	lupin-WW	Wagga Wagga	NSW	Fig. 1	DD
Heenan et al. 2004	6	6			15.50	18.38	burnt residue	with residue	3	0.33		0.222	13	11-20	0-10		0-10	29 (0-10 cm)	red earth; Chromic Luvisol	lupin-WW	Wagga Wagga	NSW	Fig. 1	CT
Heenan et al. 2004	6	6			17.40	19.42	burnt residue	with residue	3	0.33		0.126	16	11-20	0-10		0-10	29 (0-10 cm)	red earth; Chromic Luvisol	lupin-WW	Wagga Wagga	NSW	Fig. 1	DD
Heenan et al. 2004	6	6			16.83	18.15	burnt residue	with residue	3	0.33		0.083	16	11-20	0-10		0-10	29 (0-10 cm)	red earth; Chromic Luvisol	lupin-WW	Wagga Wagga	NSW	Fig. 1	CT
Heenan et al. 2004	6	6			19.71	19.71	burnt residue	with residue	3	0.33		0.000	21	21-30	0-10		0-10	29 (0-10 cm)	red earth; Chromic Luvisol	lupin-WW	Wagga Wagga	NSW	Fig. 1	DD
Heenan et al. 2004	6	6			15.10	17.29	burnt residue	with residue	3	0.33		0.104	21	21-30	0-10		0-10	29 (0-10 cm)	red earth; Chromic Luvisol	lupin-WW	Wagga Wagga	NSW	Fig. 1	CT
Hoyle et al. 2006	3	3	1.00	1.20			burnt residue	residue retained	1.5	0.67	0.182		17	11-20	0-5	0-10		26	red-brown earth (red chromosol)	legume-wheat	Merredin	WA	Table 1	
Ladd et al. 1994	2	2	0.95	1.01	12.28	13.03	burnt residue	residue incorporated	1	1.00	0.061	0.075	10	0-10	0-10	0-10	0-10	14 (0-10 cm)	red-brown earth (calcic rhodoxeralf)	WW	Tarlee	SA	Table 1	
Ladd et al. 1994	2	2	0.99	1.14	12.78	14.64	burnt residue	residue incorporated	1	1.00	0.141	0.186	10	0-10	0-10	0-10	0-10	14 (0-10 cm)	red-brown earth (calcic rhodoxeralf)	WW	Tarlee	SA	Table 1	
Ladd et al. 1994	2	2	1.10	1.20	14.15	15.38	burnt residue	residue incorporated	1	1.00	0.087	0.124	10	0-10	0-10	0-10	0-10	14 (0-10 cm)	red-brown earth (calcic rhodoxeralf)	WW	Tarlee	SA	Table 1	
Ladd et al. 1994	2	2	0.95	0.96	12.28	12.40	burnt residue	residue retained	1	1.00	0.010	0.013	10	0-10	0-10	0-10	0-10	14 (0-10 cm)	red-brown earth (calcic rhodoxeralf)	WW	Tarlee	SA	Table 1	
Ladd et al. 1994	2	2	0.99	1.10	12.78	14.15	burnt residue	residue retained	1	1.00	0.105	0.137	10	0-10	0-10	0-10	0-10	14 (0-10 cm)	red-brown earth (calcic rhodoxeralf)	WW	Tarlee	SA	Table 1	
Ladd et al. 1994	2	2	1.10	1.11	14.15	14.27	burnt residue	residue retained	1	1.00	0.009	0.012	10	0-10	0-10	0-10	0-10	14 (0-10 cm)	red-brown earth (calcic rhodoxeralf)	WW	Tarlee	SA	Table 1	
Ladd et al. 1994	2	2	1.12	1.17	14.39	15.01	burnt residue	residue incorporated	1	1.00	0.044	0.062	10	0-10	0-10	0-10	0-10	14 (0-10 cm)	red-brown earth (calcic rhodoxeralf)	W-pasture	Tarlee	SA	Table 1	
Ladd et al. 1994	2	2	1.16	1.30	14.89	16.61	burnt residue	residue incorporated	1	1.00	0.114	0.172	10	0-10	0-10	0-10	0-10	14 (0-10 cm)	red-brown earth (calcic rhodoxeralf)	W-pasture	Tarlee	SA	Table 1	
Ladd et al. 1994	2	2	1.08	1.31	13.90	16.73	burnt residue	residue incorporated	1	1.00	0.193	0.283	10	0-10	0-10	0-10	0-10	14 (0-10 cm)	red-brown earth (calcic rhodoxeralf)	W-pasture	Tarlee	SA	Table 1	
Ladd et al. 1994	2	2	1.12	1.21	14.39	15.50	burnt residue	residue retained	1	1.00	0.077	0.111	10	0-10	0-10	0-10	0-10	14 (0-10 cm)	red-brown earth (calcic rhodoxeralf)	W-pasture	Tarlee	SA	Table 1	
Ladd et al. 1994	2	2	1.16	1.24	14.89	15.87	burnt residue	residue retained	1	1.00	0.067	0.099	10	0-10	0-10	0-10	0-10	14 (0-10 cm)	red-brown earth (calcic rhodoxeralf)	W-pasture	Tarlee	SA	Table 1	
Ladd et al. 1994	2	2	1.08	1.42	13.90	18.07	burnt residue	residue retained	1	1.00	0.274	0.417	10	0-10	0-10	0-10	0-10	14 (0-10 cm)	red-brown earth (calcic rhodoxeralf)	W-pasture	Tarlee	SA	Table 1	
Li et al. 2011	3	3	1.52	1.52			burnt residue	residue retained	1.5	0.67	0.000		26	21-30	0-5	0-10		29 (0-10 cm)	red earth (Oxic Paleustalf)	wheat-lupin	Wagga Wagga	NSW	Table 3	DD
Li et al. 2011	3	3	0.96	1.11			burnt residue	residue retained	1.5	0.67	0.145		26	21-30	0-5	0-10		29 (0-10 cm)	red earth (Oxic Paleustalf)	wheat-lupin	Wagga Wagga	NSW	Table 3	CT
Loch and Coughlan 1984	4	4	1.60	1.67	16.03	16.68	burnt residue	residue retained	2	0.50	0.043	0.130	5	0-10	0-10	0-10	0-10	70 (0-10 cm)	black, cracking clay (Udic Pellustert)	WW	Warwick	QLD	Table 2	CT
Loch and Coughlan 1984	4	4	1.59	1.72	15.94	17.14	burnt residue	residue retained	2	0.50	0.079	0.242	5	0-10	0-10	0-10	0-10	70 (0-10 cm)	black, cracking clay (Udic Pellustert)	WW	Warwick	QLD	Table 2	NT
Mason 1992	3	3	1.04	1.10	13.74	14.50	burnt residue	residue incorporated	1.5	0.67	0.055	0.084	9	0-10	0-10	0-10	0-10	7	yellow, gravelly, loamy sand	WW	Merredin	WA	Fig. 3	CT; no fallow
Mason 1992	3	3	0.94	0.95	12.46	12.59	burnt residue	residue incorporated	1.5	0.67	0.010	0.014	9	0-10	0-10	0-10	0-10	7	yellow, gravelly, loamy sand	W-fallow	Merredin	WA	Fig. 3	CT; fallow
Mason 1992	3	3	0.59	0.62	7.81	8.20	burnt residue	residue incorporated	1.5	0.67	0.051	0.133	3	0-10	0-10	0-10	0-10	10	red-brown loamy sand	WW	Nabawa	WA	Fig. 3	CT; no fallow
Mason 1992	3	3	0.47	0.46	6.24	6.12	burnt residue	residue incorporated	1.5	0.67	-0.019	-0.016	7	0-10	0-10	0-10	0-10	10	red-brown loamy sand	WW	Nabawa	WA	Fig. 3	CT; no fallow
Mason 1992	3	3	0.38	0.46	5.05	6.17	burnt residue	residue incorporated	1.5	0.67	0.203	0.112	10	0-10	0-10	0-10	0-10	10	red-brown loamy sand	WW	Nabawa	WA	Fig. 3	CT; no fallow
Mason 1992	3	3	0.72	0.84	9.51	11.06	burnt residue	residue incorporated	1.5	0.67	0.155	0.221	7	0-10	0-10	0-10	0-10	10	yellow-grey loamy sand	WW	Wongan Hills	WA	Fig. 3	CT; no fallow

Mason 1992	3	3	0.63	0.80	8.34	10.58	burnt residue	residue incorporated	1.5	0.67	0.244	0.224	10	0-10	0-10	0-10	0-10	10	yellow-grey loamy sand	WW	Wongan Hills	WA	Fig. 3	CT; no fallow
Noble et al. 2003	3	3	1.47	3.00			burnt residue	residue retained	1.5	0.67	0.713		7	0-10	0-2	0-10			acidic dystrophic yellow dermosol (oxic humitropept)	sugarcane	Tulla	QLD	Table 2	
Noble et al. 2003	3	3	1.32	1.64			burnt residue	residue retained	1.5	0.67	0.217		7	0-10	0-2	0-10			acidic dystrophic yellow dermosol (oxic humitropept)	sugarcane	Tulla	QLD	Table 2	
Noble et al. 2003	3	3	1.23	1.25			burnt residue	residue retained	1.5	0.67	0.016		7	0-10	0-2	0-10			acidic dystrophic yellow dermosol (oxic humitropept)	sugarcane	Tulla	QLD	Table 2	
Pankhurst et al. 2002	3	3	0.70	0.65			burnt residue	residue retained	1.5	0.67	-0.074		4	0-10	0-10	0-10			red duplex, hard setting sandy loam	wheat/canola	Cowra	NSW	Table 1	original DD site
Pankhurst et al. 2002	3	3	0.65	0.65			burnt residue	residue retained	1.5	0.67	0.000		4	0-10	0-10	0-10			red duplex, hard setting sandy loam	wheat/canola	Cowra	NSW	Table 1	original SI site
Pankhurst et al. 2002	3	3	0.55	0.60			burnt residue	residue retained	1.5	0.67	0.087		4	0-10	0-10	0-10			red duplex, hard setting sandy loam	wheat/canola	Cowra	NSW	Table 1	original CC site
Robertson and Thorburn 2007	4	4	1.39	1.88			burnt residue	with residue	2	0.50	0.303		5	0-10	0-5	0-10		20	sandy loam	sugar cane-sugar cane	Mackay	QLD	Fig. 2	late harvest
Robertson and Thorburn 2007	4	4	1.31	1.67			burnt residue	with residue	2	0.50	0.242		5	0-10	0-5	0-10		20	sandy loam	sugar cane-sugar cane	Mackay	QLD	Fig. 2	early harvest
Robertson and Thorburn 2007	3	3	1.30	2.11			burnt residue	with residue	1.5	0.67	0.481		6	0-10	0-5	0-10		39	clay	sugar cane-sugar cane	Tully	QLD	Fig. 2	late harvest
Saffigna et al. 1989	4	4	1.21	1.30	1.40	1.50	removed residue	with residue	2	0.50	0.072	0.016	6	0-10	0-10	0-10	0-10	41	vertisol; Entic Pellustert	SgSg	Biloela	QLD	Table 1	CT
Saffigna et al. 1989	4	4	1.29	1.39	1.48	1.59	removed residue	with residue	2	0.50	0.075	0.018	6	0-10	0-10	0-10	0-10	41	vertisol; Entic Pellustert	SgSg	Biloela	QLD	Table 1	NT
Standley et al. 1990	4	4			11.12	11.56	burnt/removed residue	with residue	2	0.50		0.063	7	0-10	0-10		0-10	41	vertisol; Entic Pellustert	SgSg	Biloela	QLD	Fig. 1	CT
Standley et al. 1990	4	4			11.11	12.13	burnt/removed residue	with residue	2	0.50		0.146	7	0-10	0-10		0-10	41	vertisol; Entic Pellustert	SgSg	Biloela	QLD	Fig. 1	RT
Standley et al. 1990	4	4			12.07	12.73	burnt/removed residue	with residue	2	0.50		0.095	7	0-10	0-10		0-10	41	vertisol; Entic Pellustert	SgSg	Biloela	QLD	Fig. 1	NT
Thorburn et al. 2012	4	4	1.16	1.25			burnt residue	residue retained	2	0.50	0.077		9	0-10	0-10	0-10			sandy loam	sugar cane-sugar cane	Ayr	QLD	Fig. 1 and Appendix A	
Thorburn et al. 2012	4	4	0.89	0.88			burnt residue	residue retained	2	0.50	-0.013		9	0-10	10-25	10-20			sandy loam	sugar cane-sugar cane	Ayr	QLD	Fig. 1 and Appendix A	
Thorburn et al. 2012	4	4	1.16	1.10			burnt residue	residue retained	2	0.50	-0.049		9	0-10	0-10	0-10			sandy loam	sugar cane-sugar cane	Ayr	QLD	Fig. 1 and Appendix A	
Thorburn et al. 2012	4	4	0.94	0.90			burnt residue	residue retained	2	0.50	-0.046		17	11-20	10-25	10-20			loam	sugar cane-sugar cane	Abergowrie	QLD	Fig. 1 and Appendix A	
Valzano et al. 2001	3	3	1.60	1.90			burnt residue	residue retained	1.5	0.67	0.172		3	0-10	0-7.5	0-10		37	sodic grey/brown Vertosol	wheat/safflower/canola	Natimuk	VIC	Table 3	zero gypsum
Valzano et al. 2001	3	3	1.90	1.90			burnt residue	residue retained	1.5	0.67	0.000		3	0-10	0-7.5	0-10		37	sodic grey/brown Vertosol	wheat/safflower/canola	Natimuk	VIC	Table 3	10 t/ha gypsum
Valzano et al. 2001	3	3	0.30	0.50			burnt residue	residue retained	1.5	0.67	0.511		3	0-10	15-22.5	10-20		37	sodic grey/brown Vertosol	wheat/safflower/canola	Natimuk	VIC	Table 3	zero gypsum
Valzano et al. 2001	3	3	0.50	0.80			burnt residue	residue retained	1.5	0.67	0.470		3	0-10	15-22.5	10-20		37	sodic grey/brown Vertosol	wheat/safflower/canola	Natimuk	VIC	Table 3	10 t/ha gypsum
Vu et al. 2009	3	3	0.97	0.91	12.25	11.49	burnt residue	residue retained	1.5	0.67	-0.067	-0.031	25	21-30	0-10	0-10	0-10	20 (0-10 cm)	Chromosol	wheat-faba bean	Rutherglen	NSW	Fig. 2	DD
Vu et al. 2009	3	3	0.48	0.47	6.13	6.05	burnt residue	residue retained	1.5	0.67	-0.013	-0.003	25	21-30	10-20	10-20	10-20	20 (0-10 cm)	Chromosol	wheat-faba bean	Rutherglen	NSW	Fig. 2	DD
Vu et al. 2009	3	3	0.44	0.45	5.62	5.77	burnt residue	residue retained	1.5	0.67	0.027	0.006	25	21-30	20-30	20-30	20-30	20 (0-10 cm)	Chromosol	wheat-faba bean	Rutherglen	NSW	Fig. 2	DD
Vu et al. 2009	3	3	0.26	0.23	3.32	2.97	burnt residue	residue retained	1.5	0.67	-0.114	-0.014	25	21-30	30-40	30-40	30-40	20 (0-10 cm)	Chromosol	wheat-faba bean	Rutherglen	NSW	Fig. 2	DD
Wang and Dalal 2006	4	4			20.30	19.90	burnt residue	residue retained	2	0.50		-0.012	33	31-40	0-10		0-10	65	vertisol	WW or BlyBly	Warwick	QLD	Table 1	CT; N0
Wang and Dalal 2006	4	4			20.70	20.30	burnt residue	residue retained	2	0.50		-0.012	33	31-40	0-10		0-10	65	vertisol	WW or BlyBly	Warwick	QLD	Table 1	CT; N+
Wang and Dalal 2006	4	4			19.60	20.20	burnt residue	residue retained	2	0.50		0.018	33	31-40	0-10		0-10	65	vertisol	WW or BlyBly	Warwick	QLD	Table 1	NT; N0
Wang and Dalal 2006	4	4			20.80	22.00	burnt residue	residue retained	2	0.50		0.036	33	31-40	0-10		0-10	65	vertisol	WW or BlyBly	Warwick	QLD	Table 1	NT; N+
Wang and Dalal 2006	4	4			19.40	19.50	burnt residue	residue retained	2	0.50		0.003	33	31-40	10-20		10-20	65	vertisol	WW or BlyBly	Warwick	QLD	Table 1	CT; N0
Wang and Dalal 2006	4	4			20.10	19.50	burnt residue	residue retained	2	0.50		-0.018	33	31-40	10-20		10-20	65	vertisol	WW or BlyBly	Warwick	QLD	Table 1	CT; N+
Wang and Dalal 2006	4	4			19.30	19.10	burnt residue	residue retained	2	0.50		-0.006	33	31-40	10-20		10-20	65	vertisol	WW or BlyBly	Warwick	QLD	Table 1	NT; N0
Wang and Dalal 2006	4	4			20.10	20.00	burnt residue	residue retained	2	0.50		-0.003	33	31-40	10-20		10-20	65	vertisol	WW or BlyBly	Warwick	QLD	Table 1	NT; N+
Whitbread et al. 2000	3	3	0.59	0.65			removed residue	with residue	1.5	0.67	0.093		4	0-10	0-10	0-10			red earth soil (Ferric Luvisol)	wheat/legume(lucerne, chickpea and medic)	Warialda	NSW	Table 2	

WW-wheat-wheat
Bly-barley
Sg-sorghum

CT: conventional tillage
DD: direct drill
NT: no tillage
RT: reduced tillage
N0: no fertiliser N application
N+: with fertiliser N application

Supplementary Table S3 Studies used in the meta-analysis on the effect of the use of pasture on soil C

	n	*n*	Mean values								*U*	Experimental duration	Soil sampling depth					Species					
			Soil C (%)		Soil C (Mg ha^{-1})		Practice				ln *r*												
Citation	control	treatment	control	treatment	control	treatment	control	treatment	weight	variance	%C	C stock (Mg C ha^{-1} year^{-1})	No. of years	category	depth (cm)	category for %C	category for C stock	% clay	soil type	control	treatment	Location	State	Description of data source	Other treatment
Armstrong et al. 1999	3	3	0.74	0.77	6.96	8.32	continuous	continuous pasture legume	1.5	0.67	0.048	0.341	4	0-10	0-10	0-10	0-10		black Vertisol Halpic, self-mulching)	sorghum-sorghum	siratro-siratro	Emerald	QLD	Fig. 2	
Armstrong et al. 1999	3	3	0.74	0.69	6.96	6.94	continuous	continuous pasture legume	1.5	0.67	-0.061	-0.005	4	0-10	0-10	0-10	0-10		black Vertisol Halpic, self-mulching)	sorghum-sorghum	lucerne-lucerne	Emerald	QLD	Fig. 2	
Armstrong et al. 1999	3	3	0.74	0.68	6.96	6.21	continuous	continuous pasture legume	1.5	0.67	-0.087	-0.187	4	0-10	0-10	0-10	0-10		black Vertisol Halpic, self-mulching)	sorghum-sorghum	lablab-lablab	Emerald	QLD	Fig. 2	
Armstrong et al. 1999	3	3	0.74	0.75	6.96	6.63	continuous	continuous pasture legume	1.5	0.67	0.020	-0.080	4	0-10	0-10	0-10	0-10		black Vertisol Halpic, self-mulching)	sorghum-sorghum	desmanthus-desmanthus	Emerald	QLD	Fig. 2	
Armstrong et al. 2003	3	3	0.62	0.67			continuous	continuous annual legume	1.5	0.67	0.076		7	0-10	0-10	0-10			black Vertisol, self-mulching	wheat or sorghum	*Vigna trilobata*	Emerald	QLD	Fig. 6	
Armstrong et al. 2003	3	3	0.62	0.80			continuous	continuous perennial legume	1.5	0.67	0.249		7	0-10	0-10	0-10			black Vertisol, self-mulching	wheat or sorghum	siratro-siratro	Emerald	QLD	Fig. 6	
Armstrong et al. 2003	3	3	0.62	0.79			continuous	grass legume mix	1.5	0.67	0.249		7	0-10	0-10	0-10			black Vertisol, self-mulching	wheat or sorghum	lucerne and annual medic	Emerald	QLD	Fig. 6	
Armstrong et al. 2003	3	3	0.62	0.78			continuous	grass	1.5	0.67	0.231		7	0-10	0-10	0-10			black Vertisol, self-mulching	wheat or sorghum	purple pigeon grass	Emerald	QLD	Fig. 6	
Blair and Crocker 2000	6	6	1.54	1.60	16.59	17.23	continuous	legume pasture rotation	3	0.33	0.040	0.021	30	21-30	0-10	0-10	0-10	54 (0-10 cm)	black earth (Pellic Vertisol)	wheat or sorghum	lucerne	Tamworth	NSW	Table 1	
Blair and Crocker 2000	6	6	1.54	1.60	16.59	17.23	continuous	legume pasture rotation	3	0.33	0.040	0.021	30	21-30	0-10	0-10	0-10	54 (0-10 cm)	black earth (Pellic Vertisol)	wheat or sorghum	clover	Tamworth	NSW	Table 1	
Blair and Crocker 2000	6	6	1.54	1.69	16.59	18.14	continuous	medic rotation	3	0.33	0.095	0.051	30	21-30	0-10	0-10	0-10	54 (0-10 cm)	black earth (Pellic Vertisol)	wheat or sorghum	medic	Tamworth	NSW	Table 1	
Blair and Crocker 2000	6	6	1.33	1.68	14.94	18.70	continuous	legume pasture rotation	3	0.33	0.238	0.125	30	21-30	0-10	0-10	0-10	46 (0-10 cm)	red clay (Chromic Vertisol)	wheat or sorghum	lucerne	Tamworth	NSW	Table 1	
Blair and Crocker 2000	6	6	1.33	1.66	14.94	18.43	continuous	legume pasture rotation	3	0.33	0.222	0.116	30	21-30	0-10	0-10	0-10	46 (0-10 cm)	red clay (Chromic Vertisol)	wheat or sorghum	clover	Tamworth	NSW	Table 1	
Blair and Crocker 2000	6	6	1.33	1.50	14.94	16.78	continuous	medic rotation	3	0.33	0.123	0.061	30	21-30	0-10	0-10	0-10	46 (0-10 cm)	red clay (Chromic Vertisol)	wheat or sorghum	medic	Tamworth	NSW	Table 1	
Blair et al. 2006	6	6	1.56	1.82	16.83	19.45	continuous	legume pasture rotation	3	0.33	0.155	0.080	33	31-40	0-10	0-10	0-10	54 (0-10 cm)	black earth (Pellic Vertisol)	wheat or sorghum	lucerne	Tamworth	NSW	Table 2	
Blair et al. 2006	6	6	1.56	1.71	16.83	18.34	continuous	legume pasture rotation	3	0.33	0.092	0.046	33	31-40	0-10	0-10	0-10	54 (0-10 cm)	black earth (Pellic Vertisol)	wheat or sorghum	clover	Tamworth	NSW	Table 2	
Blair et al. 2006	6	6	1.56	1.68	16.83	18.04	continuous	medic rotation	3	0.33	0.074	0.037	33	31-40	0-10	0-10	0-10	54 (0-10 cm)	black earth (Pellic Vertisol)	wheat or sorghum	medic	Tamworth	NSW	Table 2	
Blair et al. 2006	6	6	1.32	1.56	14.87	17.41	continuous	legume pasture rotation	3	0.33	0.167	0.077	33	31-40	0-10	0-10	0-10	46 (0-10 cm)	red clay (Chromic Vertisol)	wheat or sorghum	lucerne	Tamworth	NSW	Table 2	
Blair et al. 2006	6	6	1.32	1.61	14.87	17.94	continuous	legume pasture rotation	3	0.33	0.199	0.093	33	31-40	0-10	0-10	0-10	46 (0-10 cm)	red clay (Chromic Vertisol)	wheat or sorghum	clover	Tamworth	NSW	Table 2	
Blair et al. 2006	6	6	1.32	1.40	14.87	15.72	continuous	medic rotation	3	0.33	0.059	0.026	33	31-40	0-10	0-10	0-10	46 (0-10 cm)	red clay (Chromic Vertisol)	wheat or sorghum	medic	Tamworth	NSW	Table 2	
Chan 1997	3	3	0.95	1.34			continuous	continuous pasture	1.5	0.67	0.340		3	0-10	0-10	0-10			Vertisol (Typic Pellusterts)	wheat	Mitchell grass and barrel medic	Namoi View	NSW	Table 2	on permanent pasture; stubble incorporated
Chan 1997	3	3	0.79	0.93			continuous	continuous pasture	1.5	0.67	0.169		3	0-10	0-10	0-10			Vertisol (Typic Pellusterts)	wheat	Mitchell grass and barrel medic	Namoi View	NSW	Table 2	on cropping area; stubble incorporated
Chan 1997	3	3	0.61	0.71			continuous	continuous pasture	1.5	0.67	0.158		3	0-10	0-10	0-10			Vertisol (Typic Pellusterts)	wheat	Mitchell grass and barrel medic	Talbarear	NSW	Table 2	on permanent pasture; stubble incorporated
Chan 1997	3	3	0.44	0.54			continuous	continuous pasture	1.5	0.67	0.211		3	0-10	0-10	0-10			Vertisol (Typic Pellusterts)	wheat	Mitchell grass and barrel medic	Talbarear	NSW	Table 2	on cropping area; stubble incorporated
Chataway et al. 2011a	3	3	1.62	1.53	16.98	16.09	continuous cereal	pasture rotation	1.5	0.67	-0.057	-0.177	5	0-10	0-10	0-10	0-10	60 (0-10 cm)	haplic self-mulching black Vertosol	sorghum-oat	lablab-oat	Kulpi	QLD	Table 8	NT; high N
Chataway et al. 2011a	3	3	0.96	0.86	11.45	10.30	continuous cereal	pasture rotation	1.5	0.67	-0.110	-0.231	5	0-10	0-10	0-10	0-10	35 (0-10 cm)	brown Sodosol	sorghum-oat	lablab-oat	Acland	QLD	Table 8	NT; high N
Dalal et al. 1995	4	4	0.70	0.78	7.79	8.58	continuous	pasture+grass-wheat	2	0.50	0.099	0.196	4	0-10	0-10	0-10	0-10	56 (0-10 cm)	Vertisol (Typic Chromustert)	wheat	wheat-purple pigeon grass/rhodes grass+lucerne/medics	Warra	QLD	Fig. 2	4 yaers of grass and pasture
Dalal et al. 1995	4	4	0.70	0.84	7.74	9.24	continuous	pasture+grass-wheat	2	0.50	0.182	0.300	5	0-10	0-10	0-10	0-10	56 (0-10 cm)	Vertisol (Typic Chromustert)	wheat	wheat-purple pigeon grass/rhodes grass+lucerne/medics	Warra	QLD	Table 4	
Dalal et al. 1995	4	4	0.70	0.73	7.74	8.06	continuous	legume ley-wheat	2	0.50	0.042	0.064	5	0-10	0-10	0-10	0-10	56 (0-10 cm)	Vertisol (Typic Chromustert)	wheat	wheat-lucerne	Warra	QLD	Table 4	
Dalal et al. 1995	4	4	0.70	0.77	7.74	8.49	continuous	legume ley-wheat	2	0.50	0.095	0.150	5	0-10	0-10	0-10	0-10	56 (0-10 cm)	Vertisol (Typic Chromustert)	wheat	wheat-medic	Warra	QLD	Table 4	
Dalal et al. 1995	4	4	0.69	0.78	7.63	8.56	continuous	pasture+grass-wheat	2	0.50	0.118	0.116	8	0-10	0-10	0-10	0-10	56 (0-10 cm)	Vertisol (Typic Chromustert)	wheat	wheat-purple pigeon grass/rhodes grass+lucerne/medics	Warra	QLD	Table 4	
Dalal et al. 1995	4	4	0.69	0.72	7.63	7.95	continuous	legume ley-wheat	2	0.50	0.043	0.040	8	0-10	0-10	0-10	0-10	56 (0-10 cm)	Vertisol (Typic Chromustert)	wheat	wheat-lucerne	Warra	QLD	Table 4	
Dalal et al. 1995	4	4	0.69	0.69	7.63	7.63	continuous	legume ley-wheat	2	0.50	0.000	0.000	8	0-10	0-10	0-10	0-10	56 (0-10 cm)	Vertisol (Typic Chromustert)	wheat	wheat-medic	Warra	QLD	Table 4	
Holford et al. 1998	6	6			20.30	22.20	continuous	wheat-pasture	3	0.33		0.083	23	21-30	0-15			54 (0-10 cm)	self-mulching black earth (pellic vertisol)	wheat	wheat-clover	Tamworth	NSW	Table 3	
Holford et al. 1998	6	6			20.30	22.60	continuous	wheat-pasture	3	0.33		0.100	23	21-30	0-15			54 (0-10 cm)	self-mulching black earth (pellic vertisol)	wheat	wheat-lucerne	Tamworth	NSW	Table 3	
Holford et al. 1998	6	6			20.30	22.00	continuous	wheat-pasture	3	0.33		0.074	23	21-30	0-15			54 (0-10 cm)	self-mulching black earth (pellic vertisol)	wheat	wheat-medic	Tamworth	NSW	Table 3	
Holford et al. 1998	6	6			22.00	24.90	continuous	wheat-pasture	3	0.33		0.126	23	21-30	0-15			46 (0-10 cm)	slightly hard-setting red clay (chromic vertisol)	wheat	wheat-clover	Tamworth	NSW	Table 3	
Holford et al. 1998	6	6			22.00	23.50	continuous	wheat-pasture	3	0.33		0.065	23	21-30	0-15			46 (0-10 cm)	slightly hard-setting red clay (chromic vertisol)	wheat	wheat-lucerne	Tamworth	NSW	Table 3	
Holford et al. 1998	6	6			22.00	23.10	continuous	wheat-pasture	3	0.33		0.048	23	21-30	0-15			46 (0-10 cm)	slightly hard-setting red clay (chromic vertisol)	wheat	wheat-medic	Tamworth	NSW	Table 3	
Holford et al. 1998	6	6			21.30	26.00	continuous	wheat-pasture	3	0.33		0.174	27	21-30	0-15			54 (0-10 cm)	self-mulching black earth (pellic vertisol)	wheat	wheat-clover	Tamworth	NSW	Table 3	
Holford et al. 1998	6	6			21.30	23.20	continuous	wheat-pasture	3	0.33		0.070	27	21-30	0-15			54 (0-10 cm)	self-mulching black earth (pellic vertisol)	wheat	wheat-lucerne	Tamworth	NSW	Table 3	
Holford et al. 1998	6	6			21.30	24.10	continuous	wheat-pasture	3	0.33		0.104	27	21-30	0-15			54 (0-10 cm)	self-mulching black earth (pellic vertisol)	wheat	wheat-medic	Tamworth	NSW	Table 3	
Holford et al. 1998	6	6			24.00	25.30	continuous	wheat-pasture	3	0.33		0.048	27	21-30	0-15			46 (0-10 cm)	slightly hard-setting red clay (chromic vertisol)	wheat	wheat-clover	Tamworth	NSW	Table 3	
Holford et al. 1998	6	6			24.00	24.60	continuous	wheat-pasture	3	0.33		0.022	27	21-30	0-15			46 (0-10 cm)	slightly hard-setting red clay (chromic vertisol)	wheat	wheat-lucerne	Tamworth	NSW	Table 3	
Holford et al. 1998	6	6			24.00	25.10	continuous	wheat-pasture	3	0.33		0.041	27	21-30	0-15			46 (0-10 cm)	slightly hard-setting red clay (chromic vertisol)	wheat	wheat-medic	Tamworth	NSW	Table 3	
Ladd et al. 1994	2	2	0.95	1.12	12.28	14.39	continuous	wheat-pasture	1	1.00	0.165	0.212	10	0-10	0-10	0-10	0-10	14 (0-10 cm)	red-brown earth (calcic rhodoxeralf)	WW; wheat medic pasture		Tarlee	SA	Table 1	stubble burnt
Ladd et al. 1994	2	2	0.99	1.16	12.78	14.89	continuous	wheat-pasture	1	1.00	0.158	0.211	10	0-10	0-10	0-10	0-10	14 (0-10 cm)	red-brown earth (calcic rhodoxeralf)	WW; wheat medic pasture		Tarlee	SA	Table 1	stubble burnt
Ladd et al. 1994	2	2	1.10	1.08	14.15	13.90	continuous	wheat-pasture	1	1.00	-0.018	-0.025	10	0-10	0-10	0-10	0-10	14 (0-10 cm)	red-brown earth (calcic rhodoxeralf)	WW; wheat medic pasture		Tarlee	SA	Table 1	stubble burnt
Ladd et al. 1994	2	2	1.01	1.17	13.03	15.01	continuous	wheat-pasture	1	1.00	0.147	0.199	10	0-10	0-10	0-10	0-10	14 (0-10 cm)	red-brown earth (calcic rhodoxeralf)	WW; wheat medic pasture		Tarlee	SA	Table 1	stubble incorporated
Ladd et al. 1994	2	2	1.14	1.30	14.64	16.61	continuous	wheat-pasture	1	1.00	0.131	0.197	10	0-10	0-10	0-10	0-10	14 (0-10 cm)	red-brown earth (calcic rhodoxeralf)	WW; wheat medic pasture		Tarlee	SA	Table 1	stubble incorporated
Ladd et al. 1994	2	2	1.20	1.31	15.38	16.73	continuous	wheat-pasture	1	1.00	0.088	0.135	10	0-10	0-10	0-10	0-10	14 (0-10 cm)	red-brown earth (calcic rhodoxeralf)	WW; wheat medic pasture		Tarlee	SA	Table 1	stubble incorporated
Ladd et al. 1994	2	2	0.96	1.21	12.40	15.50	continuous	wheat-pasture	1	1.00	0.231	0.310	10	0-10	0-10	0-10	0-10	14 (0-10 cm)	red-brown earth (calcic rhodoxeralf)	WW; wheat medic pasture		Tarlee	SA	Table 1	stubble retained
Ladd et al. 1994	2	2	1.10	1.24	14.15	15.87	continuous	wheat-pasture	1	1.00	0.120	0.173	10	0-10	0-10	0-10	0-10	14 (0-10 cm)	red-brown earth (calcic rhodoxeralf)	WW; wheat medic pasture		Tarlee	SA	Table 1	stubble retained
Ladd et al. 1994	2	2	1.11	1.42	14.27	18.07	continuous	wheat-pasture	1	1.00	0.246	0.380	10	0-10	0-10	0-10	0-10	14 (0-10 cm)	red-brown earth (calcic rhodoxeralf)	WW; wheat medic pasture		Tarlee	SA	Table 1	stubble retained
Murphy et al. 2011	3	3	1.37	1.64	8.36	9.96	continuous cereal	pasture rotation	1.5	0.67	0.185		5	0-10	0-5	0-10		25 (A horizon)	sandy clay loam	wheat	wheat-medic	Gnowangerup	WA	Table 3	CT
Murphy et al. 2011	3	3	1.37	1.58	8.36	9.59	continuous cereal	annual pasture (continuous)	1.5	0.67	0.144		5	0-10	0-5	0-10		25 (A horizon)	sandy clay loam	wheat	ryegrass and subterranean clover	Gnowangerup	WA	Table 3	
Murphy et al. 2011	3	3	1.37	1.90	8.36	11.39	continuous cereal	perennial pasture (continuous)	1.5	0.67	0.328		5	0-10	0-5	0-10		25 (A horizon)	sandy clay loam	wheat	lucerne	Gnowangerup	WA	Table 3	
Noble et al. 2003	3	3	1.42	2.51	19.88	34.64	continuous	pasture ley	1.5	0.67	0.570	2.460	6	0-10	0-10	0-10	0-10		yellow Kandosol	sugarcane-sugarcane	mixed signal grass and pinto peanut	Tulla	QLD	Table 2	
Smettem et al. 1992	5	5	1.44	1.55	9.26	9.93	continuous	pasture rotation	2.5	0.40	0.074		5	0-10	0-5	0-10		11 (0-10cm)	red-brown earth; Calcic Luvisol	wheat	clover and grass	Kapunda	SA	Table 4	CT
Smettem et al. 1992	5	5	1.80	1.93	11.44	12.21	continuous	pasture rotation	2.5	0.40	0.070		5	0-10	0-5	0-10		11 (0-10cm)	red-brown earth; Calcic Luvisol	wheat	clover and grass	Kapunda	SA	Table 4	DD
Thomas et al. 2009	3	3	0.43	0.51	4.88	5.77	continuous	grass + legume pasture rotation	1.5	0.67	0.171	0.089	10	0-10	0-10	0-10	0-10	52	grey Vertosol	wheat	grass + lucerne + medic	Nindigully	QLD	text p.689 left column	
Whitbread et al. 2003	3	3	0.55	0.70	3.44	4.35	wheat-fallow	wheat-pasture	1.5	0.67	0.239		5	0-10	0-5	0-10		25	red earth soil (Paleustalf)	wheat-fallow; wheat-lucerne		Warialda	NSW	Fig. 5	average of +/- stubble
Whitbread et al. 2003	3	3	0.55	0.53	3.44	3.35	wheat-fallow	wheat-pasture	1.5	0.67	-0.027		5	0-10	0-5	0-10		25	red earth soil (Paleustalf)	wheat-fallow; wheat-medic		Warialda	NSW	Fig. 5	average of +/- stubble
Whitbread et al. 2003	3	3	0.47	0.75	2.99	4.68	wheat-fallow	wheat-pasture	1.5	0.67	0.458		8	0-10	0-5	0-10		25	red earth soil (Paleustalf)	wheat-fallow; wheat-lucerne		Warialda	NSW	Fig. 5	average of +/- stubble
Whitbread et al. 2003	3	3	0.47	0.55	2.99	3.44	wheat-fallow	wheat-pasture	1.5	0.67	0.145		8	0-10	0-5	0-10		25	red earth soil (Paleustalf)	wheat-fallow; wheat-medic		Warialda	NSW	Fig. 5	average of +/- stubble
Young et al. 2009	4	4	1.36	1.32	13.64	13.16	continuous	legume	2	0.50	-0.036	-0.161	3	0-10	0-10	0-10	0-10	75-80 (0-1m)	black Vertisol	wheat-barley	Luc	Hudson	NSW	Fig. 3	NT
Young et al. 2009	4	4	1.21	1.15	13.68	12.95	continuous	legume	2	0.50	-0.055	-0.244	3	0-10	10-20	10-20	10-20	75-80 (0-1m)	black Vertisol	wheat-barley	Luc	Hudson	NSW	Fig. 3	NT
Young et al. 2009	4	4	1.12	1.08	12.45	11.98	continuous	legume	2	0.50	-0.038	-0.155	3	0-10	20-30	20-30	20-30	75-80 (0-1m)	black Vertisol	wheat-barley	Luc	Hudson	NSW	Fig. 3	NT
Young et al. 2009	4	4	1.36	1.46	13.64	14.62	continuous	legume	2	0.50	0.070	0.328	3	0-10	0-10	0-10	0-10	75-80 (0-1m)	black Vertisol	wheat-barley	Luc-phalaris	Hudson	NSW	Fig. 3	NT
Young et al. 2009	4	4	1.21	1.17	13.68	13.18	continuous	legume	2	0.50	-0.037	-0.166	3	0-10	10-20	10-20	10-20	75-80 (0-1m)	black Vertisol	wheat-barley	Luc-phalaris	Hudson	NSW	Fig. 3	NT
Young et al. 2009	4	4	1.12	1.14	12.45	12.61	continuous	legume	2	0.50	0.013	0.055	3	0-10	20-30	20-30	20-30	75-80 (0-1m)	black Vertisol	wheat-barley	Luc-phalaris	Hudson	NSW	Fig. 3	NT
Young et al. 2009	4	4	1.36	1.42	13.64	14.22	continuous	grass	2	0.50	0.042	0.194	3	0-10	0-10	0-10	0-10	75-80 (0-1m)	black Vertisol	wheat-barley	C_3 and C_4 perennial grasses	Hudson	NSW	Fig. 3	NT
Young et al. 2009	4	4	1.21	1.17	13.68	13.21	continuous	grass	2	0.50	-0.035	-0.156	3	0-10	10-20	10-20	10-20	75-80 (0-1m)	black Vertisol	wheat-barley	C_3 and C_4 perennial grasses	Hudson	NSW	Fig. 3	NT
Young et al. 2009	4	4	1.12	1.14	12.45	12.67	continuous	grass	2	0.50	0.018	0.075	3	0-10	20-30	20-30	20-30	75-80 (0-1m)	black Vertisol	wheat-barley	C_3 and C_4 perennial grasses	Hudson	NSW	Fig. 3	NT
Young et al. 2009	4	4	1.45	1.62	14.45	16.22	continuous	legume	2	0.50	0.116	0.295	6	0-10	0-10	0-10	0-10	75-80 (0-1m)	black Vertisol	wheat-barley	Luc	Hudson	NSW	Fig. 3	NT
Young et al. 2009	4	4	1.12	1.25	12.69	14.10	continuous	legume	2	0.50	0.105	0.235	6	0-10	10-20	10-20	10-20	75-80 (0-1m)	black Vertisol	wheat-barley	Luc	Hudson	NSW	Fig. 3	NT
Young et al. 2009	4	4	1.09	1.14	12.12	12.62	continuous	legume	2	0.50	0.040	0.083	6	0-10	20-30	20-30	20-30	75-80 (0-1m)	black Vertisol	wheat-barley	Luc	Hudson	NSW	Fig. 3	NT
Young et al. 2009	4	4	1.45	1.60	14.45	15.97	continuous	legume	2	0.50	0.100	0.254	6	0-10	0-10	0-10	0-10	75-80 (0-1m)	black Vertisol	wheat-barley	Luc-phalaris	Hudson	NSW	Fig. 3	NT
Young et al. 2009	4	4	1.12	1.21	12.69	13.66	continuous	legume	2	0.50	0.074	0.163	6	0-10	10-20	10-20	10-20	75-80 (0-1m)	black Vertisol	wheat-barley	Luc-phalaris	Hudson	NSW	Fig. 3	NT
Young et al. 2009	4	4	1.09	1.10	12.12	12.20	continuous	legume	2	0.50	0.006	0.013	6	0-10	20-30	20-30	20-30	75-80 (0-1m)	black Vertisol	wheat-barley	Luc-phalaris	Hudson	NSW	Fig. 3	NT
Young et al. 2009	4	4	1.45	1.66	14.45	16.63	continuous	grass	2	0.50	0.140	0.363	6	0-10	0-10	0-10	0-10	75-80 (0-1m)	black Vertisol	wheat-barley	C_3 and C_4 perennial grasses	Hudson	NSW	Fig. 3	NT
Young et al. 2009	4	4	1.12	1.16	12.69	13.07	continuous	grass	2	0.50	0.030	0.064	6	0-10	10-20	10-20	10-20	75-80 (0-1m)	black Vertisol	wheat-barley	C_3 and C_4 perennial grasses	Hudson	NSW	Fig. 3	NT
Young et al. 2009	4	4	1.09	1.10	12.12	12.18	continuous	grass	2	0.50	0.005	0.010	6	0-10	20-30	20-30	20-30	75-80 (0-1m)	black Vertisol	wheat-barley	C_3 and C_4 perennial grasses	Hudson	NSW	Fig. 3	NT

Luc-lucerne

CT: conventional tillage
DD: direct drill
NT: no tillage

Supplementary Table S4 Studies used in the meta-analysis on the effect of fertiliser N application on soil C

	n	*n*	Mean values								ln *r*	*U*	Experimental duration		Soil sampling depth										
			Soil C (%)		Soil C (Mg ha^{-1})		Practice																		
Citation	control	treatment	control (CT)	treatment	control	treatment	control	treatment	weight	variance	%C	C stock (Mg C ha^{-1} year^{-1})	No. of years	category	depth (cm)	category for %C	category for C stock	% clay	soil type	Species	N application rate (kg N ha^{-1})	Location	State	Description of data source	Other treatment
Dalal 1989	4	4	1.66	1.68	16.98	17.17	N0	N+	2	0.50	0.0120	0.0146	13	11-20	0-10	0-10	0-10	65	Vertisol (Hermitage clay)	WW or Bly Bly	23	Warwick	QLD	Table 2	CT; residue burnt
Dalal 1989	4	4	1.71	1.74	17.45	17.74	N0	N+	2	0.50	0.0174	0.0219	13	11-20	0-10	0-10	0-10	65	Vertisol (Hermitage clay)	WW or Bly Bly	23	Warwick	QLD	Table 2	CT; residue retained
Dalal 1989	4	4	1.70	1.60	17.36	16.40	N0	N+	2	0.50	-0.0606	-0.0734	13	11-20	0-10	0-10	0-10	65	Vertisol (Hermitage clay)	WW or Bly Bly	23	Warwick	QLD	Table 2	NT; residue burnt
Dalal 1989	4	4	1.72	1.92	17.55	19.43	N0	N+	2	0.50	0.1100	0.1446	13	11-20	0-10	0-10	0-10	65	Vertisol (Hermitage clay)	WW or Bly Bly	23	Warwick	QLD	Table 2	NT; residue retained
Dalal 1989	4	4	1.66	1.76	16.98	17.93	N0	N+	2	0.50	0.0585	0.0730	13	11-20	0-10	0-10	0-10	65	Vertisol (Hermitage clay)	WW or Bly Bly	69	Warwick	QLD	Table 2	CT; residue burnt
Dalal 1989	4	4	1.71	1.79	17.45	18.21	N0	N+	2	0.50	0.0457	0.0582	13	11-20	0-10	0-10	0-10	65	Vertisol (Hermitage clay)	WW or Bly Bly	69	Warwick	QLD	Table 2	CT; residue retained
Dalal 1989	4	4	1.70	1.67	17.36	17.07	N0	N+	2	0.50	-0.0178	-0.0219	13	11-20	0-10	0-10	0-10	65	Vertisol (Hermitage clay)	WW or Bly Bly	69	Warwick	QLD	Table 2	NT; residue burnt
Dalal 1989	4	4	1.72	1.94	17.55	19.61	N0	N+	2	0.50	0.1204	0.1589	13	11-20	0-10	0-10	0-10	65	Vertisol (Hermitage clay)	WW or Bly Bly	69	Warwick	QLD	Table 2	NT; residue retained
Dalal et al. 1991	4	4	1.75	1.77	17.83	18.02	N0	N+	2	0.50	0.0114	0.0094	20	11-20	0-10	0-10	0-10	65	Vertisol (Hermitage clay)	WW or Bly Bly	23	Warwick	QLD	Table 1	CT; residue burnt
Dalal et al. 1991	4	4	1.76	1.79	17.93	18.21	N0	N+	2	0.50	0.0169	0.0142	20	11-20	0-10	0-10	0-10	65	Vertisol (Hermitage clay)	WW or Bly Bly	23	Warwick	QLD	Table 1	CT; residue retained
Dalal et al. 1991	4	4	1.65	1.65	16.88	16.88	N0	N+	2	0.50	0.0000	0.0000	20	11-20	0-10	0-10	0-10	65	Vertisol (Hermitage clay)	WW or Bly Bly	23	Warwick	QLD	Table 1	NT; residue burnt
Dalal et al. 1991	4	4	1.77	1.81	18.02	18.40	N0	N+	2	0.50	0.0223	0.0188	20	11-20	0-10	0-10	0-10	65	Vertisol (Hermitage clay)	WW or Bly Bly	23	Warwick	QLD	Table 1	NT; residue retained
Dalal et al. 1991	4	4	1.75	1.77	17.83	18.02	N0	N+	2	0.50	0.0114	0.0094	20	11-20	0-10	0-10	0-10	65	Vertisol (Hermitage clay)	WW or Bly Bly	69	Warwick	QLD	Table 1	CT; residue burnt
Dalal et al. 1991	4	4	1.76	1.87	17.93	18.96	N0	N+	2	0.50	0.0606	0.0517	20	11-20	0-10	0-10	0-10	65	Vertisol (Hermitage clay)	WW or Bly Bly	69	Warwick	QLD	Table 1	CT; residue retained
Dalal et al. 1991	4	4	1.65	1.76	16.88	17.93	N0	N+	2	0.50	0.0645	0.0522	20	11-20	0-10	0-10	0-10	65	Vertisol (Hermitage clay)	WW or Bly Bly	69	Warwick	QLD	Table 1	NT; residue burnt
Dalal et al. 1991	4	4	1.77	1.83	18.02	18.59	N0	N+	2	0.50	0.0333	0.0282	20	11-20	0-10	0-10	0-10	65	Vertisol (Hermitage clay)	WW or Bly Bly	69	Warwick	QLD	Table 1	NT; residue retained
Dalal et al. 1995	4	4	0.70	0.71	7.74	7.85	N0	N+	2	0.50	0.0142	0.0215	5	0-10	0-10	0-10	0-10	56 (0-10 cm)	Vertisol (Typic Chromustert)	WW	25	Warra	QLD	Table 4	CT; stubble removed
Dalal et al. 1995	4	4	0.76	0.80	8.38	8.81	N0	N+	2	0.50	0.0513	0.0855	5	0-10	0-10	0-10	0-10	56 (0-10 cm)	Vertisol (Typic Chromustert)	WW	25	Warra	QLD	Table 4	NT; stubble removed
Dalal et al. 1995	4	4	0.70	0.76	7.74	8.38	N0	N+	2	0.50	0.0822	0.1288	5	0-10	0-10	0-10	0-10	56 (0-10 cm)	Vertisol (Typic Chromustert)	WW	75	Warra	QLD	Table 4	CT; stubble removed
Dalal et al. 1995	4	4	0.76	0.77	8.38	8.49	N0	N+	2	0.50	0.0131	0.0214	5	0-10	0-10	0-10	0-10	56 (0-10 cm)	Vertisol (Typic Chromustert)	WW	75	Warra	QLD	Table 4	NT; stubble removed
Dalal et al. 1995	4	4	0.69	0.69	7.63	7.63	N0	N+	2	0.50	0.0000	0.0000	8	0-10	0-10	0-10	0-10	56 (0-10 cm)	Vertisol (Typic Chromustert)	WW	25	Warra	QLD	Table 4	CT; stubble removed
Dalal et al. 1995	4	4	0.66	0.71	7.31	7.85	N0	N+	2	0.50	0.0730	0.0673	8	0-10	0-10	0-10	0-10	56 (0-10 cm)	Vertisol (Typic Chromustert)	WW	25	Warra	QLD	Table 4	NT; stubble removed
Dalal et al. 1995	4	4	0.69	0.69	7.63	7.63	N0	N+	2	0.50	0.0000	0.0000	8	0-10	0-10	0-10	0-10	56 (0-10 cm)	Vertisol (Typic Chromustert)	WW	75	Warra	QLD	Table 4	CT; stubble removed
Dalal et al. 1995	4	4	0.66	0.76	7.31	8.38	N0	N+	2	0.50	0.1411	0.1344	8	0-10	0-10	0-10	0-10	56 (0-10 cm)	Vertisol (Typic Chromustert)	WW	75	Warra	QLD	Table 4	NT; stubble removed
Dalal et al. 2007	4	4			8.40	9.10	N0	N+	2	0.50		0.0636	11	11-20	0-10		0-10	56 (0-10 cm)	Vertisol (Typic Chromustert)	WW	75	Warra	QLD	Table 5	CT; stubble retained
Dalal et al. 2007	4	4			8.40	8.50	N0	N+	2	0.50		0.0091	11	11-20	0-10		0-10	56 (0-10 cm)	Vertisol (Typic Chromustert)	WW	75	Warra	QLD	Table 5	NT; stubble retained
Dalal et al. 2011	4	4			19.46	19.64	N0	N+	2	0.50		0.0045	40	31-40	0-10		0-10	65 (0-10 cm)	Vertisol (black self-mulching cracking clay; Ustic Pellustert)	WW or BlyBly	30	Warwick	QLD	Fig. 1	residue burnt; average of CT and NT
Dalal et al. 2011	4	4			19.64	20.67	N0	N+	2	0.50		0.0258	40	31-40	0-10		0-10	65 (0-10 cm)	Vertisol (black self-mulching cracking clay; Ustic Pellustert)	WW or BlyBly	30	Warwick	QLD	Fig. 1	residue retained; average of CT and NT
Dalal et al. 2011	4	4			19.46	19.57	N0	N+	2	0.50		0.0027	40	31-40	0-10		0-10	65 (0-10 cm)	Vertisol (black self-mulching cracking clay; Ustic Pellustert)	WW or BlyBly	90	Warwick	QLD	Fig. 1	residue burnt; average of CT and NT
Dalal et al. 2011	4	4			19.64	21.26	N0	N+	2	0.50		0.0405	40	31-40	0-10		0-10	65 (0-10 cm)	Vertisol (black self-mulching cracking clay; Ustic Pellustert)	WW or BlyBly	90	Warwick	QLD	Fig. 1	residue retained; average of CT and NT
Dalal et al. 2011	4	4			21.18	21.17	N0	N+	2	0.50		-0.0002	40	31-40	10-20		10-20	65 (0-10 cm)	Vertisol (black self-mulching cracking clay; Ustic Pellustert)	WW or BlyBly	30	Warwick	QLD	Fig. 1	residue burnt; average of CT and NT
Dalal et al. 2011	4	4			20.49	20.92	N0	N+	2	0.50		0.0108	40	31-40	10-20		10-20	65 (0-10 cm)	Vertisol (black self-mulching cracking clay; Ustic Pellustert)	WW or BlyBly	30	Warwick	QLD	Fig. 1	residue retained; average of CT and NT
Dalal et al. 2011	4	4			21.18	20.57	N0	N+	2	0.50		-0.0153	40	31-40	10-20		10-20	65 (0-10 cm)	Vertisol (black self-mulching cracking clay; Ustic Pellustert)	WW or BlyBly	90	Warwick	QLD	Fig. 1	residue burnt; average of CT and NT
Dalal et al. 2011	4	4			20.49	21.30	N0	N+	2	0.50		0.0203	40	31-40	10-20		10-20	65 (0-10 cm)	Vertisol (black self-mulching cracking clay; Ustic Pellustert)	WW or BlyBly	90	Warwick	QLD	Fig. 1	residue retained; average of CT and NT
Dalal et al. 2011	4	4			21.59	21.44	N0	N+	2	0.50		-0.0037	40	31-40	20-30		20-30	65 (0-10 cm)	Vertisol (black self-mulching cracking clay; Ustic Pellustert)	WW or BlyBly	30	Warwick	QLD	Fig. 1	residue burnt; average of CT and NT
Dalal et al. 2011	4	4			21.10	21.42	N0	N+	2	0.50		0.0080	40	31-40	20-30		20-30	65 (0-10 cm)	Vertisol (black self-mulching cracking clay; Ustic Pellustert)	WW or BlyBly	30	Warwick	QLD	Fig. 1	residue retained; average of CT and NT
Dalal et al. 2011	4	4			21.59	21.08	N0	N+	2	0.50		-0.0128	40	31-40	20-30		20-30	65 (0-10 cm)	Vertisol (black self-mulching cracking clay; Ustic Pellustert)	WW or BlyBly	90	Warwick	QLD	Fig. 1	residue burnt; average of CT and NT
Dalal et al. 2011	4	4			21.10	21.68	N0	N+	2	0.50		0.0145	40	31-40	20-30		20-30	65 (0-10 cm)	Vertisol (black self-mulching cracking clay; Ustic Pellustert)	WW or BlyBly	90	Warwick	QLD	Fig. 1	residue retained; average of CT and NT
Fettell and Gill 1995	4	4	0.92	0.99	11.42	12.20	N0	N+	2	0.50	0.0683	0.0520	15	11-20	0-10	0-10	0-10	25	red-brown earth	WW	50	Condobolin	NSW	Table 3	average of stubble and tillage treatments
Heenan et al. 2004	6	6			21.10	20.23	N0	N+	3	0.33		-0.1442	6	0-10	0-10		0-10	29 (10 cm)	red earth; Chromic Luvisol	WW	100	Wagga Wagga	NSW	Fig. 1	CT; stubble burnt
Heenan et al. 2004	6	6			16.54	17.69	N0	N+	3	0.33		0.0888	13	11-20	0-10		0-10	29 (10 cm)	red earth; Chromic Luvisol	WW	100	Wagga Wagga	NSW	Fig. 1	CT; stubble burnt
Heenan et al. 2004	6	6			15.67	16.25	N0	N+	3	0.33		0.0361	16	11-20	0-10		0-10	29 (10 cm)	red earth; Chromic Luvisol	WW	100	Wagga Wagga	NSW	Fig. 1	CT; stubble burnt
Heenan et al. 2004	6	6			14.23	15.67	N0	N+	3	0.33		0.0687	21	21-30	0-10		0-10	29 (10 cm)	red earth; Chromic Luvisol	WW	100	Wagga Wagga	NSW	Fig. 1	CT; stubble burnt
Ladd et al. 1994	2	2	0.95	0.99	12.28	12.78	N0	N+	1	1.00	0.0412	0.0500	10	0-10	0-10	0-10	0-10	14 (0-10 cm)	red-brown earth (calcic rhodoxeralf)	WW	40	Tarlee	SA	Table 1	stubble burnt
Ladd et al. 1994	2	2	1.01	1.14	13.03	14.64	N0	N+	1	1.00	0.1211	0.1614	10	0-10	0-10	0-10	0-10	14 (0-10 cm)	red-brown earth (calcic rhodoxeralf)	WW	40	Tarlee	SA	Table 1	stubble incorporated
Ladd et al. 1994	2	2	0.96	1.10	12.40	14.15	N0	N+	1	1.00	0.1361	0.1744	10	0-10	0-10	0-10	0-10	14 (0-10 cm)	red-brown earth (calcic rhodoxeralf)	WW	40	Tarlee	SA	Table 1	stubble retained
Ladd et al. 1994	2	2	0.95	1.10	12.28	14.15	N0	N+	1	1.00	0.1466	0.1869	10	0-10	0-10	0-10	0-10	14 (0-10 cm)	red-brown earth (calcic rhodoxeralf)	WW	80	Tarlee	SA	Table 1	stubble burnt
Ladd et al. 1994	2	2	1.01	1.20	13.03	15.38	N0	N+	1	1.00	0.1724	0.2355	10	0-10	0-10	0-10	0-10	14 (0-10 cm)	red-brown earth (calcic rhodoxeralf)	WW	80	Tarlee	SA	Table 1	stubble incorporated
Ladd et al. 1994	2	2	0.96	1.11	12.40	14.27	N0	N+	1	1.00	0.1452	0.1868	10	0-10	0-10	0-10	0-10	14 (0-10 cm)	red-brown earth (calcic rhodoxeralf)	WW	80	Tarlee	SA	Table 1	stubble retained
Ladd et al. 1994	2	2	1.12	1.16	14.39	14.89	N0	N+	1	1.00	0.0351	0.0495	10	0-10	0-10	0-10	0-10	14 (0-10 cm)	red-brown earth (calcic rhodoxeralf)	wheat medic pasture	40	Tarlee	SA	Table 1	stubble burnt
Ladd et al. 1994	2	2	1.17	1.30	15.01	16.61	N0	N+	1	1.00	0.1054	0.1597	10	0-10	0-10	0-10	0-10	14 (0-10 cm)	red-brown earth (calcic rhodoxeralf)	wheat medic pasture	40	Tarlee	SA	Table 1	stubble incorporated
Ladd et al. 1994	2	2	1.21	1.24	15.50	15.87	N0	N+	1	1.00	0.0245	0.0369	10	0-10	0-10	0-10	0-10	14 (0-10 cm)	red-brown earth (calcic rhodoxeralf)	wheat medic pasture	40	Tarlee	SA	Table 1	stubble retained
Ladd et al. 1994	2	2	1.12	1.08	14.39	13.90	N0	N+	1	1.00	-0.0364	-0.0496	10	0-10	0-10	0-10	0-10	14 (0-10 cm)	red-brown earth (calcic rhodoxeralf)	wheat medic pasture	80	Tarlee	SA	Table 1	stubble burnt
Ladd et al. 1994	2	2	1.17	1.31	15.01	16.73	N0	N+	1	1.00	0.1130	0.1719	10	0-10	0-10	0-10	0-10	14 (0-10 cm)	red-brown earth (calcic rhodoxeralf)	wheat medic pasture	80	Tarlee	SA	Table 1	stubble incorporated
Ladd et al. 1994	2	2	1.21	1.42	15.50	18.07	N0	N+	1	1.00	0.1600	0.2566	10	0-10	0-10	0-10	0-10	14 (0-10 cm)	red-brown earth (calcic rhodoxeralf)	wheat medic pasture	80	Tarlee	SA	Table 1	stubble retained
Thomas et al. 2009	3	3	0.43	0.48	4.88	5.44	N0	N+	1.5	0.67	0.1100	0.0558	10	0-10	0-10	0-10	0-10	52	grey Vertisol	WW	80	Nindigully	QLD	text p.689 left column	
Wang and Dalal 2006	4	4			20.30	20.70	N0	N+	2	0.50		0.0121	33	31-40	0-10		0-10	65	Vertisol	WW or BlyBly	68.3	Warwick	QLD	Table 1	CT; burnt residue
Wang and Dalal 2006	4	4			19.90	20.30	N0	N+	2	0.50		0.0121	33	31-40	0-10		0-10	65	Vertisol	WW or BlyBly	68.3	Warwick	QLD	Table 1	CT; residue retained
Wang and Dalal 2006	4	4			19.60	20.80	N0	N+	2	0.50		0.0364	33	31-40	0-10		0-10	65	Vertisol	WW or BlyBly	68.3	Warwick	QLD	Table 1	NT; burnt residue
Wang and Dalal 2006	4	4			20.20	22.00	N0	N+	2	0.50		0.0545	33	31-40	0-10		0-10	65	Vertisol	WW or BlyBly	68.3	Warwick	QLD	Table 1	NT; residue retained
Wang and Dalal 2006	4	4			19.40	20.10	N0	N+	2	0.50		0.0212	33	31-40	10-20		10-20	65	Vertisol	WW or BlyBly	68.3	Warwick	QLD	Table 1	CT; burnt residue
Wang and Dalal 2006	4	4			19.50	19.50	N0	N+	2	0.50		0.0000	33	31-40	10-20		10-20	65	Vertisol	WW or BlyBly	68.3	Warwick	QLD	Table 1	CT; residue retained
Wang and Dalal 2006	4	4			19.30	20.10	N0	N+	2	0.50		0.0242	33	31-40	10-20		10-20	65	Vertisol	WW or BlyBly	68.3	Warwick	QLD	Table 1	NT; burnt residue
Wang and Dalal 2006	4	4			19.10	20.00	N0	N+	2	0.50		0.0273	33	31-40	10-20		10-20	65	Vertisol	WW or BlyBly	68.3	Warwick	QLD	Table 1	NT; residue retained

WW-wheat-wheat
Bly-barley

CT: conventional tillage
NT: no tillage