

Graham Centre Carbon Workshop

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NSW DPI, Wagga Wagga and
Queanbeyan

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- NSW DPI, Wagga Wagga / Queanbeyan

Can we store C in soils?

Yes we can!

Sort of.....

a bit.....

SATWAGL 1979-2004 0-30 cm depth (540 mm)

Rotation	Stubble	Tillage	Kg C/ha/year
L W	Retain	nil	-52
L W	Burn	nil	-98
LW	Retain	3 passes	-174
LW	Burn	3 passes	-176
WW +N	Burn	3 passes	-193
WW	Burn	3 passes	-278
C W	Retain	nil	+257

KohnRot 1963-1980

0-30 cm depth

Rotation		<i>Kg C/ha/year</i>
33% pasture	67% wheat	+216
50%	50%	+253
67%	33%	+403
(100%)	(0%)	(+570)

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MASTER 1992-2010

0-30 cm depth

Rotation	<i>Kg C/ha/year</i>
Perennial pasture	+499
Annual pasture	+496
Perennials limed	+552
Annuals limed	+462

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Condobolin

430 mm, 15 years, no t_0 or ρ_B

%SOC	Burnt stubble		Retained stubble		
	Cult-Scar	DD	Cult-Chisel	DD	Offset+scar
0-2.5	1.01	0.98	1.01	0.99	1.03
2.5-5	1.00	0.98	1.01	0.99	1.02
5-10	0.83	0.82	0.85	0.86	0.85

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Rutherglen

590 mm, 28 years, $t_0=1.9\%SOC$

%SOC	Burnt stubble		Retained stubble		P
	Cult-scar	DD	Cult-	DD	
0-5	1.09	1.24*	-	1.12	0.06
5-10	0.77	0.76	-	0.74	ns
10-20	0.41	0.46	-	0.46	ns

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Unknown

609 mm, 21 years, in prep

%SOC	Burnt stubble	Retained stubble
Depth (cm)	DD	DD
0-5	1.27	1.33
5-10	0.72	0.71
10-15	0.46	0.45
15-20	0.33	0.32

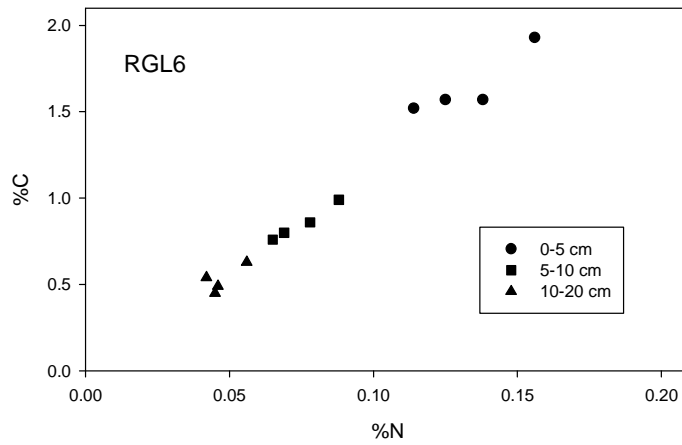
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Part 1 conclusions:

- Change in SOC is not rapid:
-300 to +550 kg C/ha.30cm /yr
- Increases in SOC are associated with the pasture phase, not stubble retention and no tillage

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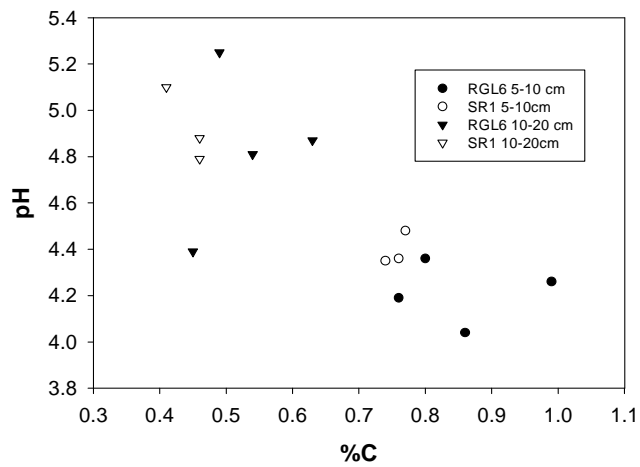
RGL6, Rutherglen



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Rutherglen

pH vs %C 5-20 cm



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liming

- 440 kg CO₂/t limestone
- + mining
- + crushing/milling
- + transport
- + spreading
- + increased mineralisation of native C
- extra DM produced & returned to soil

Part 2 conclusions:

- C sequestration has costs in terms of:
 - N bagged N vs organic N?
 - acidity limestone to maintain production

Overall:

- Net C sequestration in soil is slow and unspectacular,
There are
- on-farm productivity and
- environmental benefits that are well known and near sacred
but
- There are costs to C sequestration
(no free lunch, including this GC one)