Sub Soil Modification 2015 Point Pass Agricultural Bureau

RURAL SOLUTIONS SA
PIRSA

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Government of South Australia
South Australian Murray-Darling Basin Natural Resources Management Board

Natural Resources
SA Murray-Darling Basin

PREMIUM FOOD AND WINE FROM OUR CLEAN ENVIRONMENT

Australian Government | National Landcare Programme

SOUTH AUSTRALIA

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Primary Industries and Regions SA

NRM Agricultural and Fishing Innovation Grant

Point Pass Agricultural Bureau

Sub soil Modification

Based on work conducted by Rick Peries DEPI Victoria and Researchers from Southern Farming Systems, La Trobe University, Victoria

Targeting a range of hostile clays – heavy textured, sodic, slightly saline, those with bleached A2, also hard capped – delved and not delved

Clay modification by microorganisms and organic matter to increase size of macro pores - improve clay ped structure, infiltration, drainage, root access & volume, air supply

Proof of concept stage – under a range of soils and conditions, lower rainfall than early Victorian sites

Clay subsoil changes –P Sale, R Peries, et al

4 years after Lucerne pellets at 30 -40 cm in clay

Before

After

Subsoil treatments

- Control
- Rip Only
- Plant based compost – 20 to 40 t/ha
- Plant and Animal manure based compost – 20 to 40 t/ha
- Neutrog Chicken Manure pellets – 20 – 40 t/ha
- Gypsum – 10 t/ha
- Brew - Mixture of Compost, chicken manure pellets and gypsum – 40t/ha
- TPR and Grape Marc mixtures
- Compost and Biochar
- Pig Manure Compost

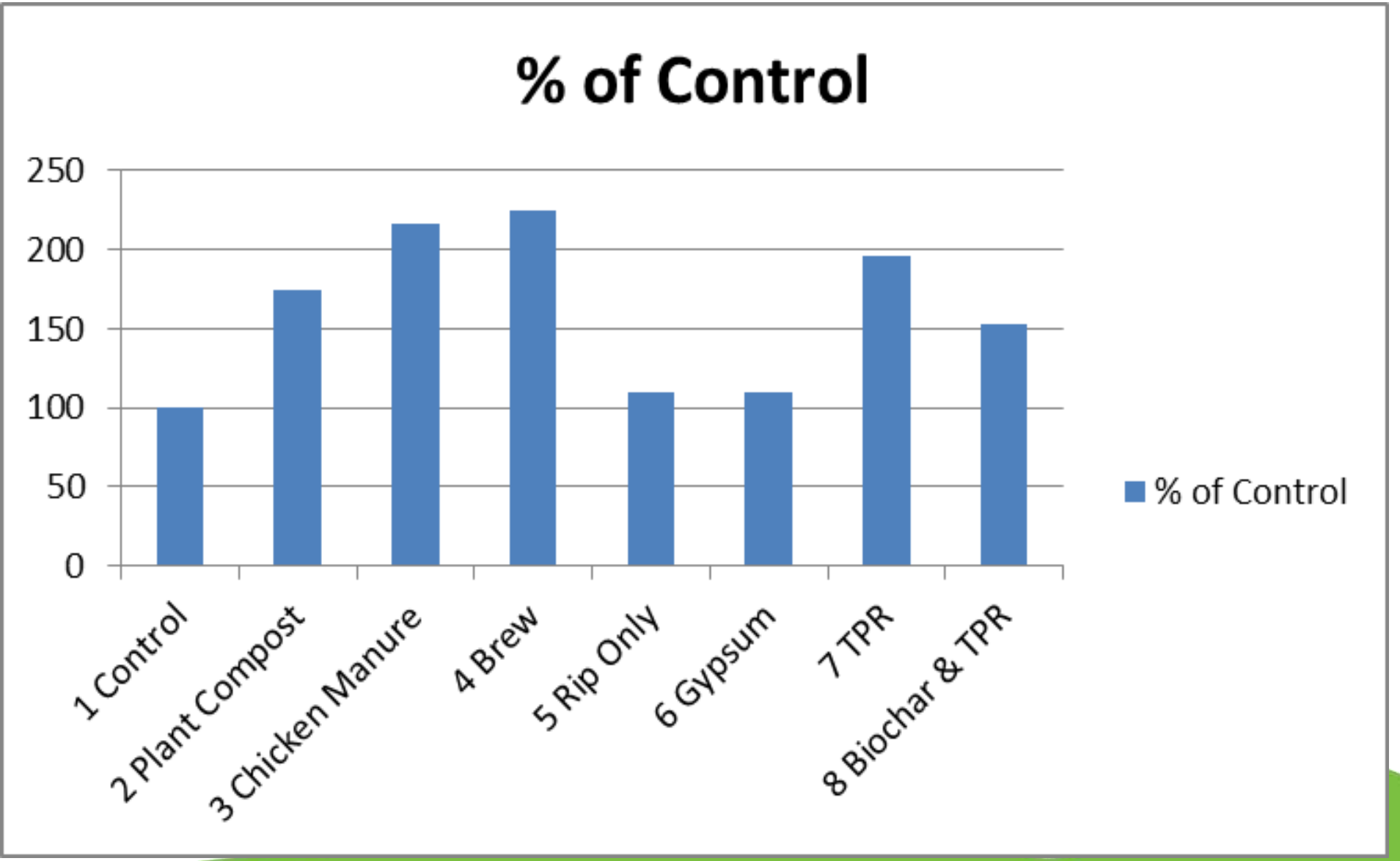
Robertstown Site – Low OC, Sodic

Depth cm	Texture	Colour	Gravel %	pH H_2O	pH $CaCl_2$	Acid Reaction Free % Lime	EC 1:5 dS/m	Ece dS/m	Org.C %	NO_3 N mg/kg	Avail. P mg/kg	Cl mg/kg	Avail. K mg/kg	Boron mg/kg	SO_4-S mg/kg	Trace Elements (DTPA) mg/kg				CEC cmol(+) /kg	Exchangeable cations cmol(+)kg				
																Cu	Zn	Fe	Mn		Ca	Mg	Na	K	ESP
Paddock	FSCL	Orange																							
0-10	FSCL	Orange	5-Jan	7	6.2	0.18 N	0.109	1.58	0.43	15	32	65	275	0.87	7.2	0.91	0.37	10.8	11.7	5.68	3.08	1.31	0.64	0.7	11.3
10-30	MClay	Dk Red	0	9	8	0.28 N	0.452	3.42	0.48	5	3	395.3	412	5.8	29.1					19.91	6.68	7.22	4.95	1.1	24.8
30-40	LMClay	Dk Red	0	9.2	8.3	2.5 Mod	1.109	6.06	0.32	3	5	893	572	16.52	128					31.05	8.56	10.9	10.2	1.5	32.7
70+	LMClay	BrOr	0	9.3	8.3	31 V High	0.978	7.1	0.17	2	3	825.6	390	9.69	138					24.92	9.29	6.91	7.72	1	31
Critical / Ideal values				6-8	5-7	-	<0.7	<8	1.5		35		120	<15	6	0.2	0.5		1.0	15	75%of CEC	20% of CEC	<6% of CEC	5% of CEC	<6

Robertstown site

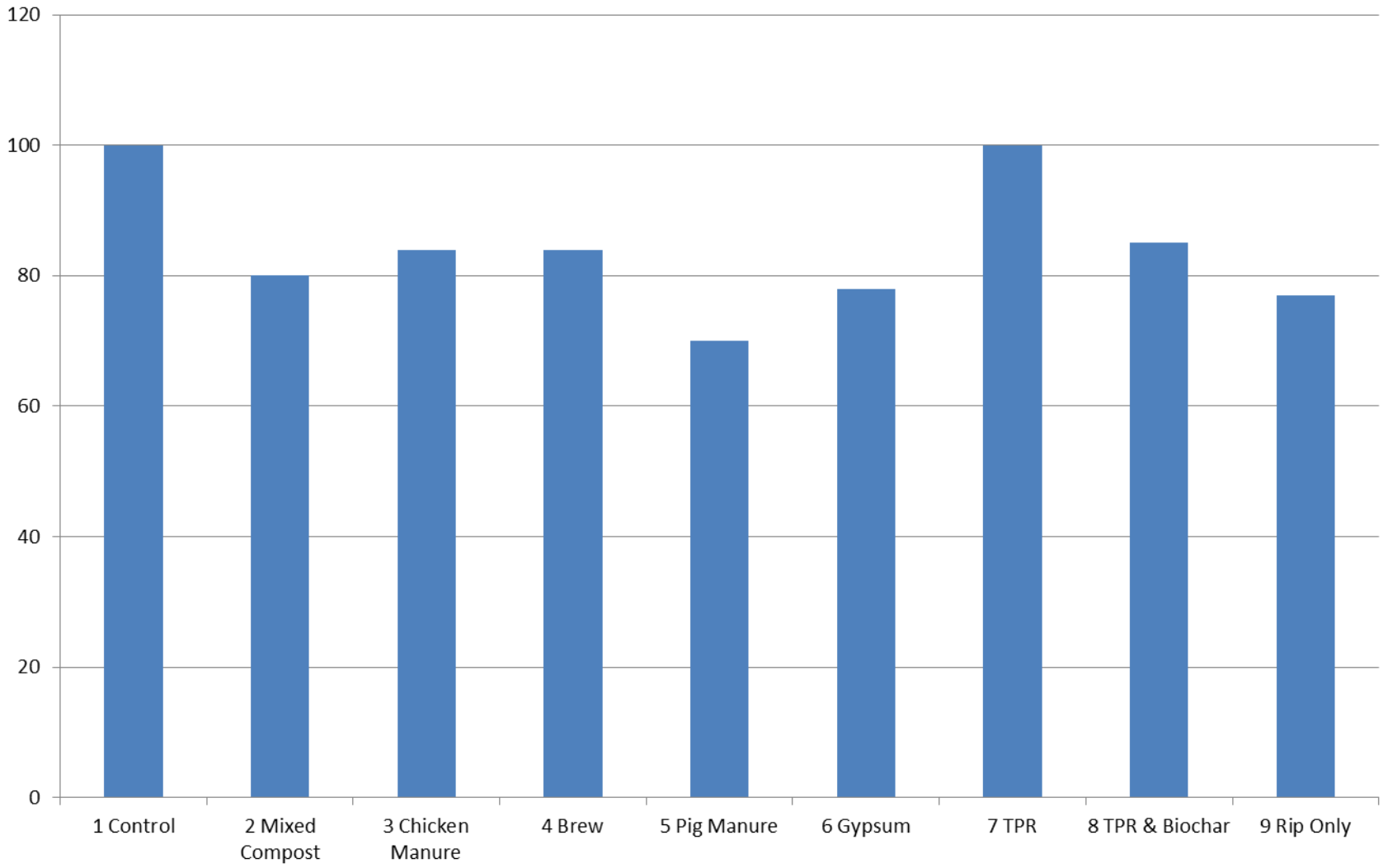

CONTROL

Dry matter relative to Control treatment



Point Pass – Lentils after 30mm rain

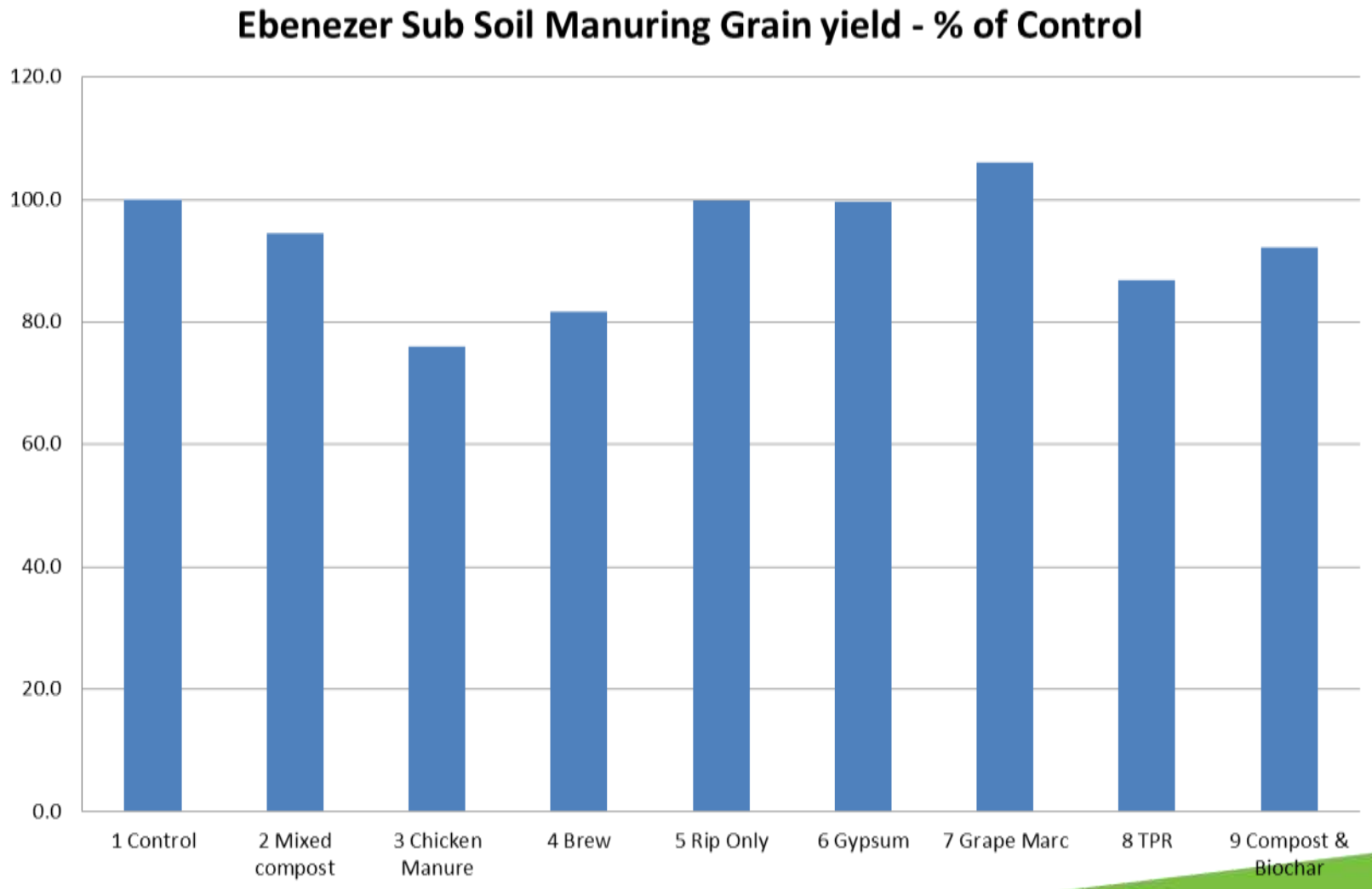
Lentil yield as % of Control



Ebenezer Sub soil Modification site

Normally Waterlogged, not in 015, heavy textured clay

Yield as % of Control



Giles Corner –Cracking clay, No-Till, stubble retained, Controlled Traffic 15 years

Taller crop, Pod height 20 to 30cms Higher

Alma South – Beans growth response

Rip only – similar to Control

Brew – Compost, Gypsum & Chicken Manure

Long Plains – Barley limited by rainfall

Halbury – Barley 6t/ha

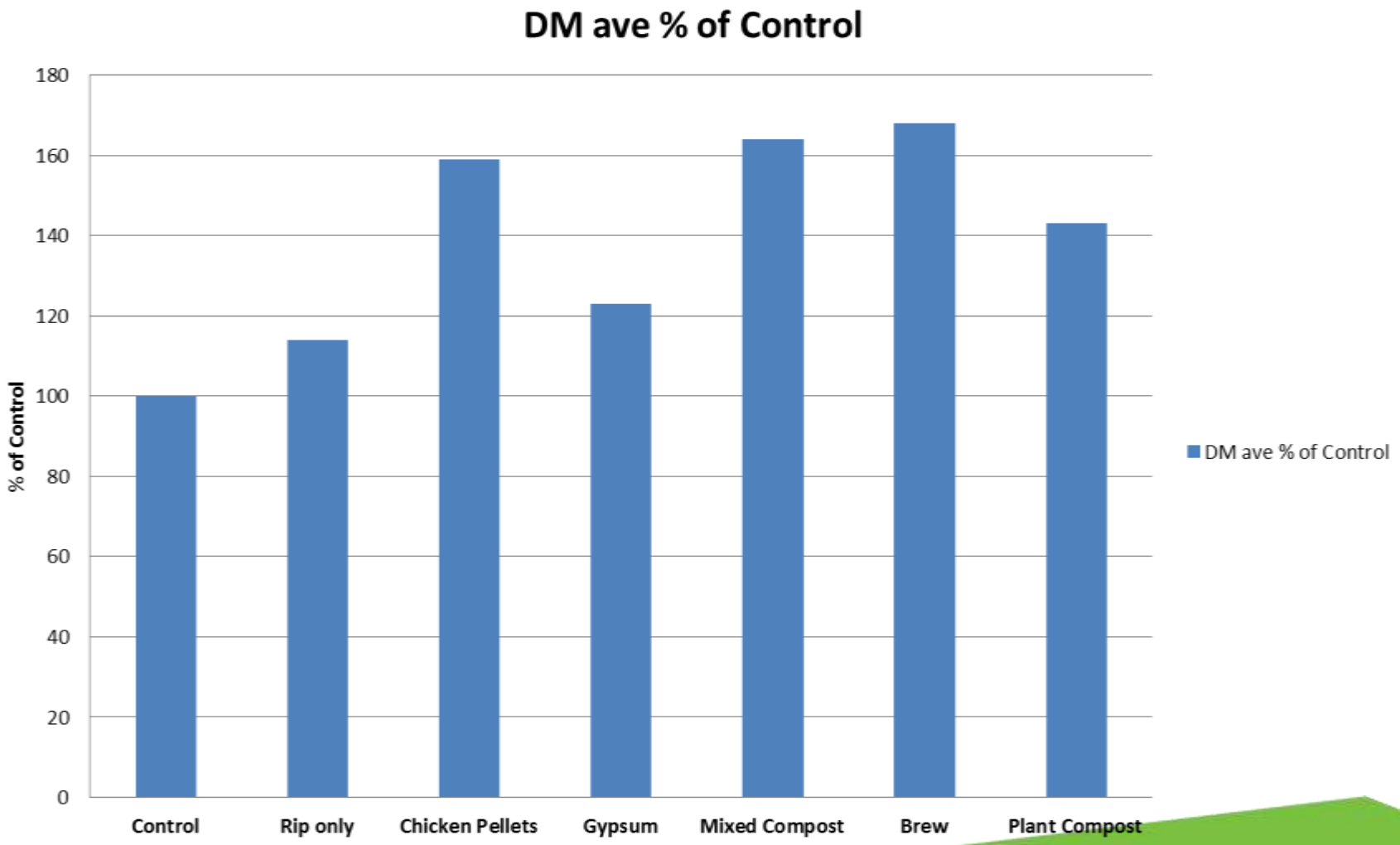
Australia
egions SA

Halbury - Control

Stockport Sub soil Modification site

Waterlogging variability due to slope, heavy textured clay

Dry matter relative to Control treatment



Dry matter yield Kg/ha