Digging up the past

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Summary Agronomy - in the true sense meaning field studies - has a proud record of contribution to the economic development of Australia. There is much of value in the historical record which can illuminate current research. Regrettably, indexing is limited, and because of the "divide" of computer-aided data bases, much is difficult of access. Some is buried in the archives of agricultural department libraries, and the files of country research stations, and therefore endangered by current rationalisations. Many journals have become extinct. It is argued that special efforts and strategies arc necessary to overcome these problems and enhance the value of these records.

The late Manning Clark, one of our notable historians, argued that Australians had few genuinely original ideas until the 1950s. Preferring the cultural cringe/shelter of Europe to innovative thought and/or invention.

He may have been right from the perspective of philosophy and related studies, but he was wide of the mark for Australian agriculture. It is hard to arrive at a date at which field trialing of new systems began - I make a distinction between mere acclimatisation testing of introduced plants and animals and the integration of these things into new combinations to devise new systems, or the deliberate breeding of new cultivars based on an understanding of the specific characteristics of the new environment. However, it could well have been a century before the time suggested by Manning Clark.

Perhaps identifying a precise time is irrelevant. What is important is the recognition that, quite early, there was conscious intellectual effort, not a mindless adoption of European systems, as is claimed by many ignorant of the history of our agriculture.

Much of this was probably the activity of individuals, rather than in established organisations - institution founding probably represented a coalescing of ideas, rather than a beginning. With regard to institutions, important mile-stones were the establishment of agricultural colleges in the 1880s - based on the same rhetoric as the Land Grant Colleges in the USA, but taking a different route in the 1900s - and the agriculture faculties in the early 1900s. Agriculture departments were set up from the 1870s. but had a regulatory rather than an investigative focus.

How important is it that contemporary workers have access to the work and ideas of the earlier years? Surely we must always strive for greater continuity, and improved perspective. Furthermore. it might help modify the all too prevalent view that our forebears were stupid. and not interested in sustainability. I suspect they were about as wise, and as foolish as we are. and hopefully we in turn will be so judged by our descendants.

The Australian Society of Agronomy has a particular interest in crops and pastures. It is probable that the accessing of prior records may be worse for pasture studies because of a decline in emphasis during the 1970s and 1980s, in a sense breaking the continuity of effort in such things as reviews.

It has been interesting to ask young researchers leading questions about specific fields. Some examples follow. Firstly, the use of superphosphate. and interest in maintenance dressings - the notion of residual phosphate. One worker expressed the opinion that we should have become interested in this earlier. The library of the (former!) South Australian Department of Agriculture has an incomplete set of Farmer's Field Day Books from Kybybolite Research Station. The 1940 book had a section on residual phosphate - this within 20 years of the widespread use of super. The same worker commented that it was unfortunate that early work had been cutting trials, with so little use of the grazing animal. Again. the results in the 1940 Kybybolite book were based on grazing. Sample pages from 1940 and 1944 are included in this paper. Of course, by modern scientific standards designs were inadequate, and many conclusions suspect, but the

results were still valuable. The 1970 Field Day Book contained the results of an extensive 12 year residual phosphate trial, well replicated, measuring every conceivable plant and animal variable. As I was leaving the library the librarian stopped me and pleaded with me to use any influence I have to ensure the maintenance of the central archives. She said that the intention seemed to be to localise retention at each research station. She had no confidence in this strategy. Here concern must be even more acute with the 1992 changes to what was the Department of Agriculture.

GRAZING TEST PLOTS—*continued.*

Wimmera Rye Grass and Subterranean Clover.

	Sheep.
10 sown 1924	3.41
11 sown 1928	3.85
4A sown 1934	4.02
1 sown 1934	2.96
Mean	3.84

Natural Pasture Plots Fertilizer Test

GRAZING IN SHEEP PER ACRE PER ANNUM, 1929-40.

	Sheep.
9 Gypsum and super	2.46
8 180lb. super	3.77
7 90lb. super	3.45
6 No manure	0.90
5 Rock phosphate every 10 years	2.50
4 Rock phosphate annually	2.40
3 Lime and super	3.71
2 520lb. super	3.19
1 Aluminium rock phosphate, 1919 only	1.72
13 Limestone and super	3.45
12 No manure	1.14
11 Ephos phosphate, 1924 only	2.25
10 Lime and super	3.93

Subterranean Clover and Wimmera Rye Grass Fertilizer Test

GRAZING IN SHEEP PER ACRE PER ANNUM, 1929-40.

	Sheep.
3 Gypsum and super	4.67
4 90lb. super	4.70
5 180lb. super	5.13
6 45lb. super	3.50
7 Lime and super	5.41
8 Ephos phosphate	4.60
9 No manure	1.12
10 490lb. Island phosphate every five years	3.15
11 2470lb. Island phosphate every five years	3.12
12 Potash only	2.02
13 Potash and rock phosphate	3.82
14 1240lb. Island phosphate every five years	2.24
15 1cwt. super	4.42

Wimmera Rye Grass and Subterranean Clover

TREATMENT OF B PLOTS.

1925-35.—Subterranean Clover pasture topdressed annually with 1cwt. super per acre.
1936.—80lb. Wimmera Rye Grass sown by cultivating and rolling.

	Sheep per acre, 1936-40.
Plot B1.—1935-40—45lb. super annually	3.43
Plot B2.—1935-40—90lb. super annually	3.73
Plot B3.—1935-40—No manure	2.50
Plot B4.—1935-40—180lb. super annually	5.82

NATURAL PASTURE PLOTS FERTILIZER TEST—*continued*

Manure per Acre.	Grazing in Sheep per Acre per Annum. 1943-44 Mean.		1928-44 Mean.	
A. No Manure—				
Plot No. 9	1·25	1·27	0·97	1·04
Plot No. 12	1·29		1·11	
B. Rock Phosphate—				
Plot No. 4, 56 lb. applied annually	2·28	2·48	2·47	2·44
Plot No. 5, 1 cwt. applied every 10 years	2·68		2·41	
C. 45 per cent Super—				
Plot No. 2, 50 lb. annually	2·91		3·11	
Plot No. 3, 90 lb. annually	3·05	3·10	3·05	3·38
Plot No. 8, 180 lb. annually	3·81		3·66	
D. Lime and Super—				
P3, 90 lb. super annually, lime every 10 years	3·26		3·54	
P10, 1 cwt. super annually, lime every 10 years	2·93	2·98	3·01	3·26
P12, 1 cwt. super annually, limestone every 10 years	2·83		3·24	
E. Gypsum and Super—P8, 1 cwt. super annually, gypsum every 10 years	2·85		3·25	
F. Aluminium Phosphate—P1, 1 ton 1939 only	1·72		1·78	
G. Ephos Phosphate—P11, 6 cwt. 1924 only	1·92		2·23	
Mean carrying capacity natural pasture plots	—		2·00	

SUBTERRANEAN CLOVER FERTILIZER TEST.

Studied on P9 to 1939.

These 15 plots were established with subterranean clover and Wimmera rye grass in 1921, and have since been maintained by top dressing fertiliser over the surface. They also have never been mown and have always been grazed by sheep. The following list shows the manure given to each and the grazing secured last season, together with the mean sheep carried for the past 16 years.

Manure per Acre.	Grazing in Sheep per Acre per Annum. 1943-44 Mean.		1928-44 Mean.	
A. No Manure—Plot No. 9	1·30		1·28	
B. Rock Phosphate—				
Plot No. 10, 180 lb. P_2O_5 every 5 years	3·52		3·21	
Plot No. 11, 90 lb. P_2O_5 every 2 years	3·46	3·66	3·40	3·46
Plot No. 14, 40 lb. P_2O_5 every 3 years	1·99		2·20	
C. Potash Plots—				
Plot No. 12, 37 lb. potash per annum without phosphate	1·29	2·07	2·09	2·94
Plot No. 13, 37 lb. potash per annum with phosphate	2·86		3·80	
D. 45 per cent Super—				
Plot No. 4, 90 lb. per annum (92 lb. P_2O_5 every 2 years)	4·41		4·20	
Plot No. 5, 180 lb. per annum (184 lb. P_2O_5 every 4 years)	4·39	4·24	4·06	4·22
Plot No. 6, 45 lb. per annum (46 lb. P_2O_5 every 1 years)	4·12		3·89	
Plot No. 15, 1 cwt. annually	4·04		4·20	
E. Plot No. 7, 1 cwt. lime every 10 years, 1 cwt. 45 per cent super annually	4·23		4·06	
F. Plot No. 3, 1 cwt. gypsum every 10 years, 1 cwt. 45 per cent super annually	3·48		4·42	
G. Plot No. 9, Ephos phosphate (not since 1924) 56 lb. P_2O_5 every 2 years	3·94		3·79	
Mean carrying capacity subterranean clover plots	—		3·49	

Secondly. the botanical composition of southern Australian pastures. It is fashionable to assert that the sub clover component of our pastures is not as good as it was. I suspect that no one has really analysed the full record, looking at composition in the context of the total environment. In all southern states there were excellent relevant studies through the 1940s and 1950s. One seminal study was that of Tiver & Crocker, but it is rarely sighted because it was published in the little known Journal of The British Grassland Society. Some other relevant information is in the "old grey series" of CSIR Bulletins. Most young researchers have never heard of these! The basic knowledge of sub clover was an important underpinning. Mention sub clover, and older workers immediately think of the names Donald. Black. Aitken. Rossiter, Simon (a review) and Morley (another review) - to name a few. Even when students turn up reference to this work, how easy is it for them to access it. using it the essays and assignments? One of the problems is that most of this is BC - before computers as aids to accessing.

There are a number of related matters that we need to take more seriously.

Firstly. we need to take steps to ensure that the records are kept. either as hard copy. or as microfilm, and adequately indexed. The Australian Society of Agronomy needs to consider its responsibilities. Research stations are threatened more than ever before, and with them will go valuable records.

Secondly. we may well be able to develop alternative strategies, or supplements to electronic listing and access. One such is a "mapping" of pathways through this information, linking pieces together, and listing related material. This must be done in such a way that it is succinct, readable, attractive to students, easy to follow. With Martin Hallett of the Victorian Scienceworks Museum, I am preparing a book based on the concept of a "family tree" of Australian agronomy - that a scientific idea/result "marries" another scientific idea, or perhaps a piece of technology, and has offspring. One excellent example is the recognition of the value of phosphorus for pastures and the development of the superphosphate spinner, enabling spreading through stumps and logs.

The format favoured is a brief presentation, in not too technical language, of the idea/invention, with a sighting of what is considered to be a key reference, followed by a listing of the things that derive directly from this (the offspring) with a single reference.

Most societies such as the Australian Society of Agronomy have a significant resource in retirees who could be enlisted in the causes discussed in this paper. I believe the issues raised are worthy of discussion at this conference.