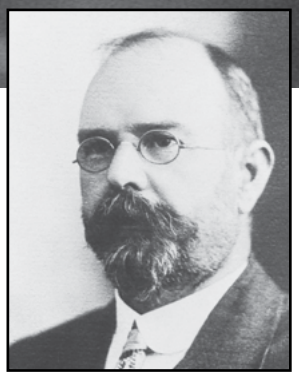
FARRER MEMORIAL TRUST

ANNUAL REPORT 2014

FARRER MEMORIAL RESEARCH SCHOLARSHIP FUND

THE 2014 FARRER MEMORIAL ORATION

FARRER MEMORIAL TRUST



FARRER MEMORIAL RESEARCH SCHOLARSHIP FUND

The Farrer Memorial Trust was established in 1911 to perpetuate the memory of William James Farrer and to encourage and inspire agricultural scientists. Initially it awarded scholarships for 'study or research in agricultural problems'. Later it included the delivery of an annual oration and the presentation of the Farrer Memorial Medal to a distinguished agricultural scientist for service rendered in the fields of research, education or administration.

The Director General of the Department of Primary Industries, Mr Scott A Hansen, is the Chairman of the Trust. The other official Trustees are Mr M Bullen, Deputy Director General, Agriculture NSW of the Department of Primary Industries; Professor M Adams, Professor and Dean of the Faculty of Agriculture, The University of Sydney; and Dr J C Radcliffe AM, CSIRO, Unley Park, South Australia. The non-official Trustees, representing industry, are: Mr M J R Arnott AM, Boorowa, Ms R Clubb, Araluen, and Mr G Mason, Boorowa.

The 2014 Farrer Memorial Travelling Scholarships were awarded to:

- Ms Laura Ziems, QAAFI, The University of Queensland
- Ms Juanita Luara-Smith, The University of Adelaide
- Ms Kylie Reynolds, Charles Sturt University
- Ms Caspar Roxburgh, QAAFI, The University of Queensland

The Farrer Memorial Travelling Scholarship is designed to support overseas travel by post-graduates enrolled for a PhD on any aspect of field crop research.

The 2014 Farrer Memorial Medal was awarded to Dr Elizabeth Dennis, CSIRO on 30 September 2014 at the ComBio Conference in the National Convention Centre, Canberra. Dr Dennis delivered the Farrer Oration entitled 'Arabidopsis and Agriculture – What can we learn about Hybrid Vigour?'

The text of the 2014 Farrer Memorial Oration is reproduced on page 19 of this report.

INDEPENDENT AUDITOR'S REPORT

Trustees of the Farrer Memorial Research Scholarship Fund

To Members of the New South Wales Parliament

I have audited the accompanying financial statements of the Trustees of the Farrer Memorial Research Scholarship Fund (the Fund), which comprise the statement of financial position as at 31 December 2014, the statement of comprehensive income, statement of changes in equity and statement of cash flows for the year then ended, notes comprising a summary of significant accounting policies and other explanatory information.

Opinion

In my opinion, the financial statements:

- give a true and fair view of the financial position of the Fund as at 31 December 2014, and of its financial performance and its cash flows for the year then ended in accordance with Australian Accounting Standards
- are in accordance with section 41C of the *Public Finance and Audit Act 1983* (PF&A Act) and the Public Finance and Audit Regulation 2010.

My opinion should be read in conjunction with the rest of this report.

The Trustees' Responsibility for the Financial Statements

The Trustees are responsible for preparing financial statements that give a true and fair view in accordance with Australian Accounting Standards and the PF&A Act and for such internal control as the Trustees determine(s) is necessary to enable the preparation of financial statements that give a true and fair view and are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

My responsibility is to express an opinion on the financial statements based on my audit. I conducted my audit in accordance with Australian Auditing Standards. Those Standards require that I comply with relevant ethical requirements relating to audit engagements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgement, including an assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation of the financial statements that give a true and fair view in order to design audit procedures appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by the Trustees, as well as evaluating the overall presentation of the financial statements.

I believe the audit evidence I have obtained is sufficient and appropriate to provide a basis for my audit opinion.

My opinion does not provide assurance:

- about the future viability of the Fund
- that it carried out its activities effectively, efficiently and economically
- about the effectiveness of the internal control
- about the security and controls over the electronic publication of the audited financial statements on any website where they may be presented
- about other information which may have been hyperlinked to/from the financial statements.

Independence

In conducting my audit, I have complied with the independence requirements of the Australian Auditing Standards and other relevant ethical pronouncements. The PF&A Act further promotes independence by:

- providing that only Parliament, and not the executive government, can remove an Auditor-General
- mandating the Auditor-General as auditor of public sector agencies, but precluding the provision of non-audit services, thus ensuring the Auditor-General and the Audit Office of New South Wales are not compromised in their roles by the possibility of losing clients or income.

C J Giumelli
Director, Financial Audit Services

22 May 2015
SYDNEY

TRUSTEE FOR FARRER MEMORIAL RESEARCH SCHOLARSHIP FUND

**STATEMENT IN ACCORDANCE WITH SECTION 41C (1B)
OF PUBLIC FINANCE AND AUDIT ACT 1983**

Pursuant to Section 41C (1B) of the *Public Finance and Audit Act 1983* and in accordance with a resolution of the Trustees of the Farrer Memorial Research Scholarship Fund, we declare on behalf of the Trust that, in our opinion:

a. the accompanying financial statements have been prepared in accordance with applicable Australian Accounting Standards (which include Australian Accounting Interpretations), the provisions of the *Public Finance and Audit Act 1983*, the applicable clauses of the *Public Finance and Audit Regulation 2010*.

a. the accompanying financial statements exhibit a true and fair view of the financial position and the financial performance of Farrer Memorial Research Scholarship Fund for the year ended 31 December 2014;

a. at the date of signing we are not aware of any circumstances that would render the financial statements misleading or inaccurate.

Scott Hansen – Chair
Dated 19 May 2015

Michael Bullen – Trustee
Dated 19 May 2015

TRUSTEE FOR FARRER MEMORIAL RESEARCH SCHOLARSHIP FUND

STATEMENT OF COMPREHENSIVE INCOME

For the year ended 31 December 2014

	Notes	2014 $	2013 $
Expenses excluding losses			
Operating expenses			
Employee related	2(a)	10,697	4,085
Other operating expenses	2(b)	26,872	25,893
Total expenses excluding losses		**37,569**	**29,978**
Revenue			
Investment revenue	3(a)	64,748	78,216
Grants and contributions	3(b)	17,297	9,174
Total revenue		**82,045**	**87,390**
NET RESULT		**44,476**	**57,412**
TOTAL COMPREHENSIVE INCOME		**44,476**	**57,412**

The accompanying notes form part of these financial statements.

TRUSTEE FOR FARRER MEMORIAL RESEARCH SCHOLARSHIP FUND

STATEMENT OF FINANCIAL POSITION

As at 31 December 2014

	Notes	2014 $	2013 $
ASSETS			
Current Assets			
Cash and cash equivalents	4	56,604	34,708
Receivables	5	3,423	3,857
Inventories	6	2,107	2,371
Other financial assets	7	61,469	75,277
Total Current Assets		**123,603**	**116,213**
Non-Current Assets			
Financial assets at fair value	8	450,188	413,102
Total Non-Current Assets		**450,188**	**413,102**
Total Assets		**573,791**	**529,315**
Net Assets		**573,791**	**529,315**
EQUITY			
Accumulated Funds		573,791	529,315
Total Equity		**573,791**	**529,315**

The accompanying notes form part of these financial statements

TRUSTEE FOR FARRER MEMORIAL RESEARCH SCHOLARSHIP FUND

STATEMENT OF CHANGES IN EQUITY

For the year ended 31 December 2014

	Accumulated Funds	Total
	$	$
Balance at 1 January 2014	**529,315**	**529,315**
Net result for the year	44,476	44,476
Total Other Comprehensive Income	-	-
Balance at 31 December 2014	**573,791**	**573,791**
Balance at 1 January 2013	**471,902**	**471,902**
Net result for the year	57,413	57,413
Total Other Comprehensive Income	-	-
Balance at 31 December 2013	**529,315**	**529,315**

The accompanying notes form part of these financial statements.

TRUSTEE FOR FARRER MEMORIAL RESEARCH SCHOLARSHIP FUND

STATEMENT OF CASH FLOWS

For the year ended 31 December 2014

	Notes	2014 $	2013 $
CASH FLOWS FROM OPERATING ACTIVITIES			
Payments			
Grants and subsidies		(19,975)	(19,990)
Finance costs		-	-
Other		(33)	(39)
Total payments		**(20,008)**	**(20,029)**
Receipts			
Interest received		5,238	5,953
Dividends received		19,731	18,671
Return on investment		935	519
Other		-	4,929
Total receipts		**25,904**	**30,072**
NET CASH FLOWS FROM OPERATING ACTIVITIES	9	**5,896**	**10,043**
CASH FLOWS FROM INVESTING ACTIVITIES			
Proceeds on maturing financial assets		16,000	-
NET CASH FLOWS FROM INVESTING ACTIVITIES		**16,000**	**-**
NET INCREASE / (DECREASE) IN CASH		**21,896**	**10,043**
Opening cash and cash equivalents		34,708	24,665
CLOSING CASH AND CASH EQUIVALENTS	4	**56,604**	**34,708**

The accompanying notes form part of these financial statements

TRUSTEE FOR FARRER MEMORIAL RESEARCH SCHOLARSHIP FUND

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 DECEMBER 2014

1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

(a) Reporting Entity

The *Farrer Memorial Research Scholarship Fund Act 1930* permits the Trustees (the Trust) to use its earnings to assist study and research into agricultural problems, meet costs of the Farrer Memorial Oration and may provide an honorarium to the recipient of the Farrer Memorial Medal. The Trust is a not-for-profit entity as profit is not its principal objective and it has no cash generating units.

These financial statements for the year ended 31 December 2014 have been authorised for issue by the Chair of the Board on 19 May 2015.

(b) Basis of Preparation

The Trust's financial statements are general purpose financial statements which have been prepared in accordance with:

- applicable Australian Accounting Standards (which include Australian Accounting Interpretations)
- the requirements of the *Public Finance and Audit Act 1983* and *Public Finance and Audit Regulation 2010* and

Property, plant and equipment, assets (or disposal groups) held for sale and financial assets at 'fair value through profit or loss' and available for sale are measured at fair value. Other financial statement items are prepared in accordance with the historical cost convention.

Judgements, key assumptions and estimations management has made are disclosed in the relevant notes to the financial statements.

All amounts are rounded to the nearest dollar and are expressed in Australian currency.

(c) Statement of Compliance

The financial statements and notes comply with Australian Accounting Standards which include Australian Accounting Interpretations.

(d) Insurance

The Trust's insurance activities are covered by NSW Department of Trade and Investment, Regional Infrastructure and Services (DTIRIS) insurance with the NSW Treasury Managed Fund Scheme of self- insurance for Government agencies.

(e) Income Recognition

Income is measured at the fair value of the consideration or contribution received or receivable. Additional comments regarding the accounting policies for the recognition of income are discussed below.

i. Contributions

Contributions (including grants and donations) are generally recognised as income when the Trust obtains control over the assets comprising the contributions. Control over the contributions is normally obtained upon the receipt of the cash.

ii. Investment revenue

Interest revenue is recognised using the effective interest method as set out in AASB 139: *Financial Instruments: Recognition and Measurement*. Dividend revenue is recognised in accordance with AASB 118 when the Trust's right to receive payment is established.

(f) Assets

i. Loans and Receivables

Receivables are non-derivative financial assets with fixed or determinable payments that are not quoted in an active market. These financial assets are recognised initially at fair value, usually based on the transaction cost or face value. Subsequent measurement is at amortised cost using the effective interest method, less an allowance for any impairment of receivables. Any changes are accounted for in the net result for the year when impaired, derecognised or through the amortisation process.

Short term receivables with no stated interest rate are measured at the original invoice amount where the effect of discounting is immaterial.

ii. Inventories

Inventories held for distribution are stated at cost, adjusted when applicable, for loss of service potential. A loss of service potential is identified and measured based on the existence of a current replacement cost that is lower than the carrying amount.

iii. Investments

Investments are initially recognised at fair value plus, in the case of investments not at fair value through profit or loss, transaction costs. The Trust determines the classification of its financial assets after initial recognition and, when allowed and appropriate, revaluates this at each financial year end.

- **Fair value through profit or loss** – The Trust subsequently measures investments classified as 'held for trading' or designated upon initial recognition 'at fair value through profit or loss' at fair value. Financial assets are classified as 'held for trading' if they are acquired for the purpose of selling in the near term. Derivatives are also classified as held for trading. Gains or losses on these assets are recognised in the net result for the year.
- **Held-to-maturity investments** – Non-derivative financial assets with fixed or determinable payments and fixed maturity that the Trust has the positive intention and ability to hold to maturity are classified as 'held-to-maturity'. These investments are measured at amortised cost using the effective interest method. Changes are recognised in the net result for the year when impaired, derecognised of through amortisation process.
- **Available-for-sale investments** – Any residual investments that do not fall into any other category are accounted for as available-for-sale investments and measured at fair value in other comprehensive income until disposed or impaired, at which time the cumulative gain or loss previously recognised in the net result for the year. However, interest calculated using the effective interest method and dividends are recognised in the net result for the year.

Purchases or sales of investments under contract that require delivery of the asset within a timeframe established by convention or regulation are recognised on the trade date; i.e. the date the Trust commits to the purchase or sell the asset.

The fair value of investments that are traded at fair value in an active market is determined by reference to quoted current bid prices at the close of business on the statement of financial position date.

(g) Liabilities

i. Payables

These amounts represent liabilities for goods and services provided to the Trust and other amounts. Payables are recognised initially at fair value, usually based on the transaction cost or face value. Subsequent measurement is at amortised cost using the effective interest method. Short-term payables with no stated interest rate are measured at the original invoice amount where the effect of discounting is immaterial.

ii. Personnel services

The Trust does not employ staff but utilises the personnel services of DTIRIS and the costs of personnel services in respect of wages and salaries, superannuation, annual leave, long service leave, and for personal leave are recognised when it is probable that settlement will be required.

(h) Fair value hierarchy

A number of the Trust's accounting policies and disclosures require the measurement of fair values, for both financial and non-financial assets and liabilities. When measuring fair value, the valuation technique used maximises the use of relevant observable inputs and minimises the use of unobservable inputs. Under AASB 13, the Trust categorises, for disclosure purposes, the valuation techniques based on the inputs used in the valuation techniques as follows:

- Level 1 – quoted prices in active markets for identical assets / liabilities that the Trust can access at the measurement date.
- Level 2 – inputs other than quoted prices included within Level 1 that are observable, either directly or indirectly.
- Level 3 – inputs that are not based on observable market data (unobservable inputs).

The Trust recognises transfers between levels of the fair value hierarchy at the end of the reporting period during which the change has occurred.

(i) Equity

i. Accumulated Funds

The category accumulated funds includes all current and prior period retained funds

(j) Comparative Information

Except when Australian Accounting Standard permits or requires otherwise, comparative information is presented in respect of the previous period for all amounts reported in the financial statements.

(k) Changes in accounting policy, including new or revised Australian Accounting Standards

NSW Public sector entities are not permitted to early adopt new Australian Accounting Standards, unless Treasury determines otherwise.

Accordingly, the Trust has not applied the following Australian Accounting Standards recently issued but not yet implemented:

- AASB 9, AASB 2010-7 and AASB 2012-6 regarding financial instruments

- AASB 1031 Materiality
- AASB 2012-3 regarding offsetting financial assets and financial liabilities
- AASB 2013-9 regarding the Conceptual Framework, Materiality and Financial Instruments (Parts B and C).
- AASB 2014-1 regarding amendments to Australian Accounting Standards
- AASB 2014-7 Amendments to Australian Accounting Standards arising from AASB 9
- AASB 2014 -8 Amendments to Australian Accounting Standards arising from AASB 9
- AASB 2015-3 Amendments to Australian Accounting Standards arising from the withdrawal of AASB 1031 Materiality

While the impact of these standards in the period of initial application has not been specifically quantified, they are not expected to materially impact the financial statements.

2. EXPENSES EXCLUDING LOSSES

		2014	2013
		$	$
(a)	**Employee related expenses**		
	Personnel expenses	10,697	4,085
	Personnel services paid by DTIRIS on behalf of the Trust.		
(b)	**Other operating expenses include the following:**		
	Auditor's remuneration	6,600	5,600
	Bank charges	33	39
	Scholarships	19,975	19,990
	Other operating expenses	264	264
		26,872	**25,893**
	Auditor's remuneration are met directly from the Recurrent Appropriations of the Minister for Primary Industries		

3. REVENUE

		2014	2013
		$	$
(a)	**Investment Revenue**		
	Interest	6,974	8,130
	Dividends	19,753	18,839
	Return on investment	935	-
	Net fair value gains on measurement of investments in listed shares designated through profit and loss	37,086	51,247
		64,748	**78,216**
(b)	**Grants and contributions**		
	Assistance from DTIRIS	**17,297**	**9,174**

4. CASH AND CASH EQUIVALENTS

	2014 $	2013 $
Cash at bank and on hand	40,592	34,708
At call deposits	16,012	-
	56,604	**34,708**

For the purposes of the financial statement of cash flows, cash and cash equivalents include cash at bank, cash on hand, short-term deposits, at call deposits and bank overdraft.
Cash and cash equivalent assets recognised in the statement of financial position are reconciled at the end of the financial year to the statement of cash flows as follows:

Cash and cash equivalents (per statement of financial position)	56,604	34,708
Closing cash and cash equivalents (per statement of cash flows)	**56,604**	**34,708**

Refer note 10 for details regarding credit risk, liquidity risk and market risk arising from financial instruments.

5. CURRENT ASSETS – RECEIVABLES

	2014 $	2013 $
Receivables from investing activities	**3,423**	**3,857**

Details regarding credit risk, liquidity risk and market risk, including financial assets that are either past due or impaired, are disclosed in note 10

6. CURRENT ASSETS – INVENTORIES

	2014 $	2013 $
Medals held for distribution – at cost	**2,107**	**2,371**

Inventories consist of Farrer Memorial Medals. Medals are valued at cost which approximates fair value.

7. CURRENT ASSETS – OTHER FINANCIAL ASSETS

	2014 $	2013 $
Macquarie bank term deposit	61,469	59,277
Rabobank term deposit	-	16,000
	61,469	**75,277**

7. CURRENT ASSETS – OTHER FINANCIAL ASSETS

Refer to Note 10 for further information regarding credit risk, liquidity risk and market risk arising from financial instruments.

8. NON-CURRENT ASSETS – FINANCIAL ASSETS AT FAIR VALUE

The following summary shows the market values (Fair value) of all shareholdings as at 31 December 2014.

	Market Value	
COMPANY	**2014**	**2013**
	$	**$**
Fixed Income Securities		
National Australia Bank (NABHA)	28,823	27,598
Macquarie Bank (MBLHB)	29,160	28,811
Suncorp Group (SBKHB)	31,779	30,053
	89,762	**86,462**
Listed Trusts		
Dexus Property Group (DXS)	14,045	12,149
Goodman Group (GMG)	8,051	6,693
Sydney Airport (SYD)	48,042	38,760
Duet Group (DUE)	31,812	26,400
SP AusNet (AST)	19,285	18,053
	121,235	**102,055**
Growth Securities (Shares)		
National Australia Bank (NAB)	38,640	40,055
Westpac Banking Corporation (WBC)	53,056	51,808
Leighton Holdings (LEI)	38,587	27,629
Wesfarmers (WES)	47,895	51,438
Telstra (TLS)	61,013	53,655
	239,191	**224,585**
Portfolio Total	**450,188**	**413,102**

The movement in the market value of the financial assets at fair value through the statement of income statement in 2014 was a gain of $37,086 (2013 gain of $51,247).

Refer to Note 10 for further information regarding fair value measurement, credit risk, liquidity risk and market risk arising from financial instruments.

9. RECONCILIATION OF CASH FLOWS FROM OPERATING ACTIVITIES TO NET RESULT

	2014	**2013**
	$	**$**
Net cash used on operating activities	**5,896**	**10,043**
Increase / (decrease) in inventories	(264)	(264)
Increase / (decrease) in receivables	(434)	(6,118)
Increase / (decrease) in fair value of financial assets	37,086	51,247
Increase / (decrease) in other financial assets	2,192	2,505
Net result	**44,476**	**57,413**

10. FINANCIAL INSTRUMENTS

The Trust's principal financial instruments are outlined below. These financial instruments arise directly from the Trust's operations or are required to finance the Trust's operations. The Trust does not enter into or trade financial instruments, including derivative financial instruments, for speculative purposes.

The Trust's main risks arising from financial instruments are outlined below, together with the Trust's objectives, policies and processes for measuring and managing risk. Further quantitative and qualitative disclosures are included throughout this financial statement.

The Board has overall responsibility for the establishment and oversight of risk management and reviews and agrees policies for managing each of these risks. Risk management policies are established to identify and analyse the risks faced by the Trust, to set risk limits and controls and to monitor risks.

The Trust's overall risk management program focuses on the risk versus return feature of financial markets and seeks to minimise adverse effects on the Trust's investment returns. The Trust currently does not use derivative instruments such as foreign exchange contracts and interest swaps to hedge its risk exposure. The Trust uses a variety of risk mitigation measures to manage the types of risk to which it is exposed. These methods include sensitivity analysis in the case of interest rates and other price risks.

The Trust maintains a number of investment portfolios to address a variety of objectives:

- A long term growth portfolio representing the Trust's asset reserves and endowments and has a long term investment horizon. This portfolio has an investment profile oriented towards growth assets and is managed by external fund managers.
- A long term debt portfolio used to generate a fixed income stream. This portfolio invests in short to medium term fixed and floating rate securities.

a. Financial instrument categories

Financial Assets	**Note**	**Category**	**Carrying Amount**	**Carrying Amount**
Class:			**2014 $**	**2013 $**
Cash and cash equivalents	4	N/A	56,604	34,708
Financial assets at fair value	8	At fair value through profit or loss – designated as such upon initial recognition	450,188	413,102
Receivables	5	Loans and receivables (at amortised cost)	3,423	3,857
Other financial assets	7	Held to maturity (at amortised cost)	61,469	75,277

b. Credit Risk

Credit risk arises when there is the possibility that the counterparty will default on their contractual obligations, resulting in a financial loss to the Trust. The maximum exposure to credit risk is generally represented by the carrying amount of the financial assets.

Credit risk arises from the financial assets of the Trust, including cash, receivables and other financial assets. No collateral is held by the Trust. The Trust has not granted any financial guarantees.

Credit risk associated with the Trust's financial assets, other than receivables, is managed through the selection of counterparties and establishment of minimum credit rating standards.

Cash

Cash comprises cash on hand and bank balances with St George Bank and Rabobank Australia Limited. St George interest is earned on the daily bank balance at market rates and Rabobank interest is earned at a flat 2% rate.

Receivables – trade debtors

All trade debtors are recognised as amounts receivable at balance date.

Other financial assets

The Trust has placed funds on deposit with Macquarie Bank Limited for a fixed term. The interest rate payable is fixed for the term of the deposit. The deposits at balance date were earning an average interest rate of 3.45% (2013: 3.70%).

c. Liquidity risk

Liquidity risk is the risk that the Trust will be unable to meet its payment obligations when they fall due. The Trust continuously manages risk through monitoring future cash flows and maturities planning to ensure adequate holding of high quality liquid assets. The Trust has no loans payable and no assets have been pledged as collateral. The Trust's exposure to liquidity risk is deemed insignificant based on prior periods' data and current assessment of risk. The Trust has no liabilities and the majority of the assets are cash, cash equivalents or tradable shares and securities.

d. Market Risk

Market risk is the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in market prices. The Trust's exposures to market risk are primarily through price risk and cash flow and fair interest rate risk.

The effect on profit and equity due to a reasonably possible change in risk variable is outlined in the information below, for interest rate risk and other price risk.

Interest rate risk

The Trust's interest rate risk arises from the cash kept in the bank account subject to interest bearing at variable average rate of 2.5%. At 31 December 2014, if interest rates decreased/ increased by 1.00% with all other variables held constant, equity would have been $566 lower/higher (2013: $347 lower/higher) as a result of an increase/decrease in fair value of the debt security.

Other price risk

The Trust has exposure to equity securities price risk. This arises from investments held by the Trust and classified on the balance sheet as Assets held at fair value through the income statement, such as the impact of a change in value of the securities would be reflected as either an increase or decrease in fair value of the security through equity.

To manage its price risk from investments in equity securities, the Trust has contracted out the management of the portfolio to external fund managers, Macquarie Equities Limited. These fund managers are mandated to diversify the investments of the portfolio under their management. The quantum of funds under management per external fund manager and the investment objectives of each external fund manager are in accordance with policies set by the Trustees.

A majority of the Trust's equity investments managed by external fund managers are denominated in AUD, are publicly traded and included in the ASX 300 Index. The impact of increases/decreases on the ASX 300 Index on the Trust's equity would be increase/decrease of $45,019, (2013: $41,311). The analysis is based on the assumption that the ASX 300 Index increased/decreased by 10%, with all other variables held constant and the Trust's equity portfolio moves according to the historical correlation with the index.

	Carrying Amount $	Interest rate risk				Other price risk			
		-1.00%		1.00%		-10.00%		10.00%	
		Profit	Equity	Profit	Equity	Profit	Equity	Profit	Equity
31 December 2014									
Financial Assets									
Cash & Cash Equivalents	56,604	(566)	(566)	566	566	-	-	-	-
Financial Assets Held to Maturity[1]	61,469	-	-	-	-	-	-	-	-
Receivables [2]	3,423	-	-	-	-	-	-	-	-
Fixed Income Securities[3]	89,762	-	-	-	-	(8,976)	(8,976)	8,976	8,976
Listed Trusts	121,235	-	-	-	-	(12,124)	(12,124)	12,124	12,124
Growth Securities	239,191	-	-	-	-	(23,919)	(23,919)	23,919	23,919
Total increase/(decrease)		**(566)**	**(566)**	**566**	**566**	**(45,019)**	**(45,019)**	**45,019**	**45,019**
31 December 2013									
Financial Assets									
Cash & Cash Equivalents	34,708	(347)	(347)	347	347	-	-	-	-
Financial Assets Held to Maturity[1]	75,277	-	-	-	-	-	-	-	-
Receivables [2]	3,857	-	-	-	-	-	-	-	-
Fixed Income Securities[3]	86,462	-	-	-	-	(8,646)	(8,646)	8,646	8,646
Listed Trusts	102,055	-	-	-	-	(10,206)	(10,206)	10,206	10,206
Growth Securities	224,585	-	-	-	-	(22,459)	(22,459)	22,459	22,459
Total increase/(decrease)		**(347)**	**(347)**	**347**	**347**	**(41,311)**	**(41,311)**	**41,311**	**41,311**

Notes:

1. Held to Maturity Term Deposits are not traded and are not subject to interest rate variation during the term.
2. Receivables include interest due on Fixed Interest Securities and Term Deposits and dividends receivable. The value of these receivables will not change due to changes in market interest rates.
3. Fixed Income Securities are composed of Listed Fixed Interest Securities which are not subject to changes in market interest rates.

e. Fair value measurement

i. Fair value compared to carrying amount

Financial instruments are generally recognised at cost, with the exception of the other financial assets, which are measured at fair value.

The carrying amount in the financial statements approximates the fair value.

ii. Fair value recognised in the statement of financial position

				2014
	Level 1 $	Level 2 $	Level 3 $	Total $
Financial assets at fair value		-		
Fixed Income Securities	89,762			89,762
Listed Trusts	121,235	-	-	121,235
Growth Securities	239,191	-	-	239,191
	450,188	-	-	450,188

				2013
	Level 1 $	Level 2 $	Level 3 $	Total $
Financial assets at fair value				
Fixed Income Securities	86,462	-	-	86,462
Listed Trusts	102,055	-	-	102,055
Growth Securities	224,585	-	-	224,585
	413,102	-	-	413,102

There were no transfers between Level 1 or 2 during the period.

11. COMMITMENTS FOR EXPENDITURE

The Trust has no commitments for expenditure as at 31 December 2014.

12. CONTINGENT ASSETS AND LIABILITIES

The Trust has no contingent assets or liabilities as at 31 December 2014.

13. AFTER BALANCE DATE EVENTS

The Trust is unaware of any significant events after balance date that would impact the financial statements and the notes to the financial statements.

END OF AUDITED FINANCIAL STATEMENTS

The 2014 FARRER MEMORIAL ORATION

Arabidopsis and Agriculture – What can we learn about Hybrid Vigour?

Dr Elizabeth Dennis

Farrer and Hybrid Vigour

Dr Elizabeth Dennis

Farrer, known as the father of the Australian wheat industry and after whom this lecture is named was remarkable because he introduced novel technologies into Australian wheat breeding including the idea of crossing wheats with different properties instead of selecting from within a line. His famous wheat 'Federation' was a cross between a wheat with good milling and baking qualities and an early maturity Indian wheat that was resistant to drought and disease. He was one of the few breeders in the world doing this sort of breeding at this time and it is worth remembering that this research was done in the early 1900s before the rediscovery of Mendel's work.

Following the idea of introducing useful characters by crossbreeding, breeders in maize found that some hybrids gave a much higher yield than did either parent .This led to the concept of hybrid vigour which was first introduced by Schull in 1928. Not all hybrids produce higher yield and breeders chased parents that had good combining ability which when crossed gave high vigour and increased yield. The increased yield is remarkable as the hybrid plants are grown under identical conditions as the parents with the same inputs of water, fertiliser and light.

Hybrids mean more yield and hence more profits. All the corn produced in the developed world is now hybrid and is the basis of a $9 billion seed industry. Hybrid vigour is used in many other crops such as rice, sorghum and vegetables.

The question of how hybrids produce their greater yield is one of the major questions of plant biology. How does the plant do it? Despite hybrids being used in agriculture for nearly a century we do not understand the molecular basis of hybrid vigour. QTL analysis in maize and rice has indicated that there are hundreds of QTL's involved in producing hybrid vigour so many genes must be involved. We know hybrid vigour must be mediated through changes in expression of genes in the hybrid. But there has been no real idea of what gene expression changes are critical for the production of vigour.

Arabidopsis and Hybrid Vigour

We decided to look for answers in our model plant Arabidopsis. Even though Arabidopsis is a weed it is like the fruit fly of plants. Arabidopsis also shows hybrid vigour quite spectacularly. You see the two parents on the top and the two reciprocal hybrids below. There can be a 200% increase in fresh weight and 90% increase in seed yield in the hybrids.

We have used Arabidopsis to investigate the molecular basis of hybrid vigour and we think the new knowledge in genetics may provide some answer s as to what is the basis of hybrid vigour.

Before I tell you about our work I would like to acknowledge the other workers in our group who have contributed to this study. Firstly Jim Peacock who co-leads our group with me and importantly the Postdoctoral Fellows and students who have been critical for the success of the project.

When scientists first investigated the combining activity of maize and other hybrids they found that in general the greater the genetic distance between the parents then the greater the hybrid vigour. This is generally true but there are some examples which are circled which show hybrid vigour with very little genetic distance between the parents. This is where our parents fit.

Epigenetics plays an important role in controlling gene expression

Now I want to pause to tell you about a recent realisation in genetics. That is that not only do DNA sequences affect the activity of genes but there is another level of control of gene activity called epigenetic control which is more to do with the accessibility of DNA sequences. This occurs in all higher animals and plants. With no change in the DNA sequence the way the DNA is packed can change whether a gene is active or not. For example if chromatin, which is the DNA strand

and its associated histone proteins, is packaged tightly by histone proteins or by increased methylation of the cytosines in DNA , then the chromatin is in a repressive state the enzyme that copies the DNA into RNA cannot access the chromatin and the gene is switched off. If the chromatin is in an open state, achieved by losing DNA methylation or modifying the histone proteins then the copying enzyme can gain access and the gene will be active.

We decided to look for a role of epigenetics in hybrid vigour to see if this was the basis for the examples showing hybrid vigour with little genetic difference between parents. We chose parents with almost identical genomes so in essence we held the genome constant and there was still hybrid vigour.

The parents are two different naturally occurring accessions of Arabidopsis, C24 and Landsberg, and the F1 hybrid has good levels of heterosis. Another feature of hybrid vigour that you can see clearly is that the vigour only holds in the F1generation and decays in the F2 where the sizes are very heterogenous, this clearly wouldn't be a successful crop. Any molecular explanation of hybrid vigour has to explain this lack of heterosis in subsequent generations and explains why farmers have to buy seed each year.

Epigenetic marks are altered in hybrids

The first epigenetic system we examined was the level of 24 nucleotide small RNAs, which we know are an important for altering DNA methylation in plants. We found a substantial decrease in the levels of small RNA in hybrids relative to the parents indicating that there are epigenetic changes. The reduced frequencies of 24nt sRNAs occur in 15–24% of the genome of the hybrid and only where there are differences in the levels of small RNAs between the parents.

A new methylation process in hybrids

Given that 24nt siRNAs direct DNA methylation processes we characterised the methylome of parents and hybrids. We found an altered methylation pattern in the hybrid that like the small RNA changes occurred in loci where the two parents had different levels of methylation. The altered methylation levels in the hybrid were generated by a completely new process we have termed Trans Chromosomal Methylation (TCM) and Trans Chromosomal deMethylation (TCdM) in which the methylation pattern of the heavily methylated allele is transferred to the second lightly methylated allele in the nuclei of the F1 hybrids. The transferred pattern involves all three cytosine sequence contexts. We found there are about 800 locations of TCM in the genome in our crosses, enough to alter expression in many genes.

The new TCM patterns are still present in the F2 generation This and other evidence we have, shows that the F1 TCM patterns can be inherited and can be passed to the F2 generation or in backcrosses to plants of the backcross generation.

Photosynthesis is important for hybrid vigour

So which genes are important for controlling heterosis? We know hybrids have larger leaves and these hybrid leaves must be larger because of increased cell size or cell number or some combination of both. We have determined that in all hybrids the increased leaf size is due to the increased number of palisade mesophyll cells and presumably other cells in the leaves and cotyledons of the hybrids.

In some of the hybrids there is an additional component of increased size of the mesophyll cells. This will lead to more chloroplasts and chlorophyll in the plant and presumably more photosynthate. We found increases in activities in the early stages of the germinating seedling in 14 out of 16 chlorophyll pathway genes over the period of 3–7 days post germination. There are 187 genes upregulated at this time of development which are targeted to the chloroplast and concerned with chloroplast function or photosynthesis. Thus all these factors are concerned with the structure and operational activities of the chloroplast and are probably associated with the causes of the larger leaf phenotype.

When we look at photosynthesis the parents and the hybrids have equal levels of efficiency of the photosynthetic process ie photosynthesis per unit area, but the total photosynthetic capacity of the hybrid is greater than the parents because of the larger leaf size. The suggestion immediately arises that increased photosynthetic capacity of the hybrids may have a lot to do with the increased vegetative and reproductive yield. We have checked this in one way by providing a photosynthetic inhibitor in early seedlings and found heterosis was completely eliminated and the leaf area of the hybrids is no longer greater than the parents.

Selection for Hybrid Mimics from the large plants of the F2

Returning to a major feature of hybrid systems, the size and yield advantage is restricted to the F1 generation. The F2 has heterogeneous plant morphologies, some comparable to F1 plants, being large and non-flowering at this stage, others present a range of biomass sizes and flowering times. Farmers who have explored the prospect of keeping seed from the F1 to generate next generation planting seed, quickly gave up when they were faced with the lack of homogeneity of the F2 and went to the seed store and bought fresh F1 planting seed.

We chose large plants from the F2 which were very similar to the F1 and self fertilised them. We thought the F1-like plants may have retained the chromosomal segments (genes) and associated epigenetic controls which are important in generating a phenotype similar to the F1 plants. We carried out recurrent selection based on large plant morphology and found progressive reduction of morphology heterogeneity and increased size in each successive progeny.

This figure shows the parents and the F1. The F2 has much greater heterogeneity but with successive generations of selection for the large plants the heterogeneity was reduced. By the F5 generation these plants approached the F1 in size and seed yield as well as in lack of variance. By the F5 we had a number of independent lines which we felt we could term hybrid mimics.

These plants cannot be thought of as hybrids any longer but are near homogeneous pure lines as judged by their morphology. By the F6 it is difficult to tell which is the hybrid and which the Hybrid Mimic. So here we have plants which faithfully mimic the F1 in size and yield and breed true.

Pathways important for Hybrid Vigour

We can use our hybrid mimics to define genes of importance in producing hybrid vigour and the hybrid mimic phenotype. As a first step of analysis we have identified the genes with altered expression common to four mimic lines and the F1 and checked their function. This identified a small number of key metabolic pathways and transcription factors, defence response genes were down-regulated, abiotic stress genes upregulated and plant hormone pathway genes were also upregulated. We are investigating these further.

Altered epigenetic states can be maintained in the Hybrid Mimics

The two genes we showed earlier to have TCM events transferring the C24 allele methylation pattern to the Ler alleles in the F1 hybrid retained the methylation pattern in the recurrent selection for the hybrid mimic lines and had similar reductions in transcriptional activity. These two loci and their epigenetic DNA methylation patterns are present as functional units in the F4 hybrid mimic lines, the same as the F1.

We have other examples in other chromosomal segments of TCM induced changes in the F1 also being present in the F4 mimics. These are the first examples of the novel DNA methylation process (TCM) occurring in the F1 and resulting in transcriptional alterations associated with the hybrid formation being retained in the selection process for the large plant phenotype of the hybrid mimics.

The hybrid mimics may provide a useful alternate breeding system for crops which do not have a hybrid system. They may also remove the need for farmers to buy seed each generation and the key genes and pathways may help us identify useful parents for enhanced vigour.

Conclusion

I have tried to show you we have made great progress in understanding the basis of hybrid vigour. We have established that epigenetic control of gene activity is a major factor. We have discovered a new process Trans Chromosomal Methylation in one of the major epigenetic controls namely DNA methylation that only occurs in the hybrid.

We wondered how this might come about but realised it was through the action of the small RNAs. In the nucleus the RNAs can recognise both copies of the gene and methylate them both ensuring the full pattern is transferred and both alleles have the same methylation pattern.

These processes can change gene activity, and as there are about 800 TCM events in the genome this can affect the activity of many genes.

Now turning to the hybrid plant, hybrids have larger leaves with more cells and in some cases larger cells. The larger leaves mean more photosynthesis which finally must be the basis of the increased yield of hybrids.

The hybrid mimics were a big surprise but may be useful in crops.

Now the results we have obtained are in Arabidopsis but we have every reason to believe they will hold in crops. And the previous dogma of genetic distance determining the level of heterosis may actually be dependent on epigenetic distance between the parents.

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