

Appendices

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Appendix 1

GRDC achievements against stakeholder priorities, 2004–05

Priorities	Relevant GRDC investments
<p>Industry 1 Sustainability and resource management:</p> <ul style="list-style-type: none"> • farming systems and rotations to protect and enhance the soil and water resource base • genetic improvement for sustainability <p>NRP 1 An environmentally sustainable Australia</p> <p>RRDP 1 Sustainable natural resource management</p>	<p>GRDC projects with a particular emphasis on sustainability included the following:</p> <ul style="list-style-type: none"> • There was further study of the use of precision agriculture to better match chemical inputs, such as fertiliser, to spatial variability in potential yield and profitability in individual paddocks or across the whole farm. This allows growers to vary inputs in order to reduce costs and to protect the environment. • A Soil Biology Initiative in South Australia, investigated disease suppression through practice change and minimal soil disturbance rather than through the use of chemical fungicides. The increase in disease suppression through practice change has provided complete control of the soil-borne diseases rhizoctonia and take-all in some trials. • A project sought to identify ways that growers can adapt to and better manage the constraints posed by sodic–saline subsoils in the northern region. <p>Packages were developed for:</p> <ul style="list-style-type: none"> • fungicide use and management approaches for controlling blackleg in canola, including an Australian blackleg management guide for canola growers • <i>MaizeMan</i>, a decision support tool for Australian maize growers • variety-specific management of pulses. <p>Protocols were established for the management of chickpea diseases.</p>
<p>Industry 2 New and innovative product development:</p> <ul style="list-style-type: none"> • identify premium markets to enhance grower returns • ensure flow of market signals <p>RRDP 2 Improving competitiveness through a whole-of-industry approach</p> <p>NRP 2 Promoting and maintaining good health</p> <p>RRDP 3 Maintaining and improving confidence in the integrity of Australian agricultural food, fish and forestry products</p>	<p>GRDC projects to improve the industry's competitiveness in new markets included:</p> <ul style="list-style-type: none"> • studies of new pulse products, such as lupin concentrates for the aquaculture feeds sector • a pulse ingredient initiative designed to increase the use of pulses in value-added products for export • research to identify, through biotransformation, new crops, markets or products that would enable growers to switch from existing markets to new, potentially higher value grain product markets • an aeration and cooling extension program, targeted at growers and smaller grain merchants, to educate growers in the practice of using aeration and cooling to manage grain quality and control insects in stored grain. <p>The GRDC continued to support the Australian Food Safety Centre of Excellence.</p> <p>A food safety risk assessment was conducted for the Australian grains industry. The study included the naturally occurring toxin deoxynivalenol, which is formed in wheat by a number of species of <i>Fusarium</i> and some other fungi that cause head blight.</p> <p>Other GRDC activities related to food safety included:</p> <ul style="list-style-type: none"> • assessment of strategies for the management of mycotoxins in maize • the Go Grains nutrition and education program • research into the quality management of barley in storage.

Priorities	Relevant GRDC investments
<p>Industry 3 Develop new alliances and links to market</p> <p>RRDP 4 Improved trade and market access</p>	<p>GRDC activities to foster market alliances included:</p> <ul style="list-style-type: none"> work to improve understanding of wheat quality relative to the requirements of high-value markets and key overseas customers support for Pulse Australia, the Australian Oilseeds Federation and the Maize Association of Australia, to ensure access to current market intelligence.
<p>Industry 4 Bringing biotechnology to bear on sustainability and consumer benefit outcomes, to support profitable farming systems and access to premium markets</p> <p>NRP 3 Frontier technologies for building and transforming Australian industries</p> <p>RRDP 5 Use of frontier technologies</p>	<p>GRDC support for the exploration of frontier technologies achieved practical results. For example:</p> <ul style="list-style-type: none"> molecular markers for resistance to anthracnose and phomopsis were discovered and their use in the narrow-leaf lupin-breeding program in Western Australia commenced molecular research at Murdoch University in Western Australia demonstrated genetic pathways involved in the ability of some plants to detoxify herbicides Diversity Arrays Technology (DARt) was successfully developed for sorghum resistance gene-specific markers and quantitative markers of phosphine resistance in stored-grain pests were validated. <p>In collaboration with livestock R&D corporations, through the Premium Grains for Livestock Program, the GRDC also supported the development of objective grain quality-testing technologies for feed grains, such as an on-farm, near-infrared spectroscopy (NIR) moisture meter.</p>
<p>Industry 5 Genetic improvement and regional adaptation of new grain varieties:</p> <ul style="list-style-type: none"> improved resistance to biotic and abiotic stress quality standards for specific end uses 	<p>The GRDC's strategic investments in breeding wheat, barley, oats and triticale are yielding new varieties with enhanced performance.</p> <p>This year also saw the release of:</p> <ul style="list-style-type: none"> the new faba bean variety <i>Cairo</i>[®], which is specifically adapted for northern New South Wales and southern Queensland two soybean varieties with large seed, superior tofu-making potential and higher yield one albus lupin variety with improved pleiochaeta root rot resistance, and one narrow-leaf lupin with increased anthracnose resistance and herbicide tolerance.
<p>Industry 6 Integrated pest management:</p> <ul style="list-style-type: none"> to minimise total cost of pests, diseases and weeds to maintain options and control strategies <p>NRP 4 Safeguarding Australia</p> <p>RRDP 6 Protecting Australia from invasive diseases and pests</p>	<p>A GRDC-supported project aimed at reducing the impact of diseases of pulse crops in Queensland resulted in the publication of a reference for growers: <i>Chickpea Disorders—the Ute Guide</i>.</p> <p>A GRDC-supported project to develop alternative grain fumigants led to the development of a mixture of ethyl formate and carbon dioxide known as Vapormate™, packaged in cylinders, which was recently registered in Australia. Ethyl formate is a naturally occurring compound found in a wide range of fruit, vegetables, cheese and grain products and will eventually be available for use by growers as a fumigant for on-farm grain storage.</p> <p>Other GRDC projects on dealing with pests included:</p> <ul style="list-style-type: none"> research identifying the management of weeds, stubble, rotations and soil nitrogen as the key to managing crown rot the evaluation and development of biocontrol options for organisms that cause annual ryegrass toxicity

Priorities	Relevant GRDC investments
<p>Industry 6 (<i>continued</i>)</p>	<p>Other GRDC projects on dealing with pests included: (<i>continued</i>)</p> <ul style="list-style-type: none"> • a study of the population dynamics of the silverleaf whitefly—an emerging pest of grain legumes, sunflowers and peanuts in the northern region—in order to generate area-wide management strategies in central Queensland cropping systems • a program to determine what threat wheat streak mosaic virus poses to Australian wheat growers and under what conditions it may be expected to occur • the improvement of an existing weed risk assessment system for screening plant imports into Australia. The system was enhanced by translating its score-based outcomes into quantitative probabilities of weediness. This enhancement will enable a more quantitative approach to quarantine decision making, and is applicable to risk assessment for either insect pest or weed incursions.
<p>Industry 7 Effective and targeted transfer and adoption of technology and knowledge for Australian growers</p> <p>RRDP 7 Creating an innovative culture</p>	<p>A range of GRDC publications and services continue to be the key avenues for disseminating information that encourages the grains industry to accept R&D to build industry capacity.</p> <p>Innovations this financial year included:</p> <ul style="list-style-type: none"> • presentations by international speakers at the February 2005 Grains Research Updates, which transferred knowledge of overseas industry practices • the transfer of a number of Grains Research Updates (including all papers, interviews and presentations) onto a CD which was mailed to update attendees • the transfer of Harvest Radio programs onto CDs, for distribution to growers through <i>Ground Cover</i> under the <i>Driving Agronomy</i> strategy. The aim is to provide growers with a series of audio CDs full of agronomic advice that they can listen to while driving in the car or the tractor. <p>Other activities included:</p> <ul style="list-style-type: none"> • assisting state agencies in the marketing and distribution of advice sheets, bulletins and industry guidelines • publishing the 2005 <i>Guidelines for Spray Application</i> • publishing <i>Agribusiness Crop Updates</i> • hosting Grains Research Updates for advisers • producing newsletters for regional advisers • supporting a number of grains industry research scholarships for PhD students and postdoctoral fellows, and undergraduate scholarships • developing accredited courses on chickpeas and mung beans for growers and advisers.
<p>Industry 8 Independent variety evaluation</p>	<p>The GRDC-supported work to develop the National Variety Trials (NVT) was completed, and NVT began to be implemented for the pre- and post-release evaluation of potential new crop varieties.</p> <p>The GRDC also maintained its leading role in coordinating wheat quality research, by supporting the GRDC Wheat Quality Research Forum which was held in Melbourne in June this year as part of the larger 2005 AWB–GRDC Wheat Industry Forum.</p>
<p>Notes: 'Industry' priorities are the eight grains industry priorities identified through consultation. 'NRP' priorities are the Australian Government's four National Research Priorities. 'RRDP' priorities are the seven Ministerial Priorities for Rural R&D Corporations and Companies.</p>	

Appendix 2

GRDC project list

Project	Project Title	2004–05 Expenditure (\$)
WINTER CEREAL IMPROVEMENT		
ACP00001	Australian Centre for Plant Functional Genomics	2,000,000
ADM00003	Malting Barley Development Council – Understanding Market Requirements	8,000
AGI00001	NVT Service Agreement – Agrisearch Pty Ltd	143,553
AGN00004	Economic analysis and agronomic evaluation of wheat in the low rainfall belt of Southern NSW	45,436
AGN1	Development and refinement of agronomic packages to maximise the genetic potential of new wheat varieties for improved farm profitability in southern NSW	44,954
AGP00004	Fast-tracking of rust resistant Stylet replacements for growers in southern Australia	241,094
AGP00005	National Triticale Improvement Program	366,500
AGP00006	Australian Winter Cereals Molecular Marker Program – component: wheat marker implementation/validation for AGT	250,000
AGP1	Australian Grain Technologies – reimbursement	258
AGP2	Australian Grain Technologies – expenses	50,256
AGT00002	Independent agronomic evaluation of national wheat and barley varieties in the Fremantle port zone.	60,862
AGT00006	NVT Service Agreement – Agritech Pty Ltd	139,446
AGT19	Development and refinement of agronomy packages to maximise the genetic potential of new wheat varieties for improved farm profitability	70,950
ANU16	Gene expression induced by root mechanical impedance in wheat	162,037
AVS00001	NVT Service Agreement – AVS Pty Ltd	133,212
AWB00005	Australian Wheat Quality Improvement Program	60,000
BBE00001	Analysis of end point royalty systems in Australia	60,000
BBM00001	Pilot scale brewing evaluation for malting barley lines	54,600
BRI00005	Noodle and dumpling wheat for Taiwan	257,304
BRI00006	National Wheat Quality Evaluation Program	211,900
BRI00020	A systematic spectroscopic study of the chemical components of wheat	162,456
BRI00028	Australian Wheat Quality Improvement Program – wheat quality laboratory network	220,300
BRI102	Grain Industries Centre for NIR: coordination and support activities	80,000
CIM00007	CIMMYT Alliance	30,000
CIM00008	CIMMYT Alliance – Component 1 Protecting the Australian wheat industry from Karnal bunt through the development and implementation of molecular markers	150,000
CIM00009	CIMMYT Alliance – Component 2 Enhancement of stress tolerance in wheat through the expanded development and use of introgressions	150,000
CIM00010	CIMMYT Alliance – Component 3 Improving the stress tolerance of wheat genotypes of relevance to the Australian production environment	297,000
CIM00011	CIMMYT Alliance – Component 4 Root diseases	100,000
CIM10	Exploitation of the genetic resources of wheats – CIMMYT Component	250,100
CIM11	Enhanced evaluation of CIMMYT spring bread wheat germplasm in Australia – CIMMYT component	190,000
CIM8	A strategic framework to model CIMMYT wheat breeding programs with application to Australia – CIMMYT Component	38,270

Project	Project Title	2004–05 Expenditure (\$)
CMB00006	MPBCRC: Improved disease resistance in cereals	278,650
CMB00007	MPBCRC: Association mapping	227,980
CMB00008	MPBCRC: New markers, genetic mapping and QTL analysis	307,446
CMB00009	MPBCRC: Disease genetics – pathogen variation and host interactions	179,830
CMB00010	MPBCRC: Germplasm wheat quality – genetic ideotype for pre-harvest sprouting (PHS) tolerance	218,379
CMB00011	MPBCRC: Education and training program	296,895
CSE129	Curation and development of the invertebrate collections within the Australian National Insect Collection	72,000
CSP00018	Wheat germplasm with improved yield performance under drought for Australian breeding programs	215,500
CSP00019	Wheat breeding for the high rainfall zones of Australia	324,480
CSP00053	Wheat traits, genes and germplasm for adaptation to water limited environment in the northern region	814,670
CSP00057	Vigorous roots for hostile soils	87,330
CSP00058	Development and delivery of salt tolerance and water use efficiency traits for durum with diversified genetic background	203,528
CSP00059	Improved wheat and barley germplasm for saline and sodic soils: a collaborative project from CSIRO and DPI Horsham	117,715
CSP00060	Making wheat starch more competitive with maize or potato starches by improving its viscosity	164,452
CSP00063	AWCCMP Phase 2 project: Towards the application of perfect markers for broad spectrum disease resistance in wheat	40,000
CSP344	Enhancing the adoption of Australian durums	15,000
CWQ00002	Gluten structure and modification for ingredient use	92,286
CWQ00010	Triticale	490,000
CWQ00011	Dual purpose triticale improvement program – University of Sydney	78,592
CWQ00013	AWCMMP component project – Phenotyping complex quality traits for marker identification and validation: Phase 2	40,368
DAN00028	Barley improvement and industry development	212,180
DAN00064	Durum industry development – to accelerate cultivar improvement for adaptation across all production regions	60,000
DAN00072	Australian Winter Cereals Molecular Marker Program – Component: Implementation/validation of molecular markers EGA	348,020
DAN00073	National Statistics Project (KP1) – Statistical support for crop improvement and NVTS	195,061
DAN00074	National Statistics Project (KP2) – Strategic statistical research for crop improvement	167,593
DAN379	Southern region crop evaluation program, Component 3 – Southern NSW Crop Evaluation Unit	193,306
DAN461	Better varieties for central and northern NSW 111	254,157
DAN472	National statistics project for the acceleration of genetic progress in crop improvement programs. Component 3: Statistical research and international collaboration	17,000
DAQ00002	Novel approaches to in-head frost tolerance	107,416
DAQ00031	Barley improvement and industry development	127,308
DAQ00032	Barley improvement and industry development	162,240
DAQ00038	Barley improvement and industry development for Northern region	1,070,160
DAQ00045	Defect elimination in wheat	106,090
DAQ00077	AWCMMP component: Pedigree-based genome mapping for marker assisted selection and recurrent parent recovery in wheat and barley; Phase II	90,000
DAQ00078	Molecular biology support for barley improvement – North	50,000

Project	Project Title	2004–05 Expenditure (\$)
DAQ483	Exploitation of the genetic resources of synthetic wheats – Queensland Department of Primary Industries and Fisheries component	325,980
DAR00002	AWCMMP component project – adding value to Diversity Arrays Technology	75,000
DAS00039	Improved oat varieties for milling, feed and hay/feed end use in the southern region oat breeding program	643,271
DAS00052	Plant genetic resources: enhancing germplasm conservation for Australian agriculture	1,070,000
DAS280	Southern Region Crop Evaluation Program. Component 1 – South Australia	510,233
DAV00012	Delivering outputs from wheat germplasm research to breeding entities	175,889
DAV00025	Barley improvement and industry development – VicDPI	448,750
DAV00047	Development of barley germplasm with inherent differences in grain protein concentration	96,522
DAV394	Southern Region Crop Evaluation Program. Component 2 – Victoria	327,463
DAV436	Development of preharvest sprouting resistant breadwheats	12,000
DAW00012	Variety specific agronomy for wheat yield and quality in the Western Region	650,205
DAW00015	Crop variety testing in Western Australia	210,000
DAW00045	Barley improvement and industry development – DAWA	1,259,760
DAW00085	Addressing rust resistance and other key traits in wheat breeding for the Western Region	419,028
DAW00089	Australian Winter Cereals Molecular Marker Program – Component: Exploiting septoria resistance in wheat: genotyping	78,533
DAW00107	Oat agronomy and industry development for the Western Region	120,000
DAW00113	Australian Winter Cereals Molecular Marker Program – Component: validation/implementation – barley, Western Region	135,000
DAW00118	Australian Winter Cereals Molecular Marker Program (AWCMMP) – Component: Implementation/validation of molecular marker DAWA	152,000
DAW00121	Post EGA wheat breeding at DAWA	766,030
DAW608	Biometrics support for variety evaluation of new crop varieties	52,747
DAW700	Establishing market requirements for soft wheat	14,500
DAW719	Crop variety information service for Western Australia	48,512
EGA00001	Enterprise Grains Australia	1,488,082
EGA00002	Enterprise Grains Australia – NSW DPI and QDPI&F	1,454,060
EGC00002	Export Grains Centre funding	500,000
GBA00003	Development of salt tolerance wheat for commercial production	965,000
GRD122	Coordinator for National Wheat and Barley Molecular Marker Programs	3,870
GRD151	Value Added Wheat CRC	750,000
GRD184	Consultancy on future directions in barley breeding in Australia	60,344
GRD197	Barley Australia Forum	1,500
GRD86	Grain Gene	869
GRS100	Grains Industry Research Scholarship – (CUR) Wheat quality and product requirements for steamed breads and steamed buns made from soft and hard wheat	15,000
GRS101	Grains Industry Research Scholarship – (UWA) Metabolomic profiling in plants to understand the role of mitochondria in environmental stress tolerance	7,500
GRS103	Grains Industry Research Scholarship – (UA) The isolation and characterisation of meiosis specific proteins in bread wheat	11,250
GRS104	Grains Industry Research Scholarship – (ANU) An examination of the role of the thioredoxin h family in the stress response of cereals	10,000
GRS105	Grains Industry Research Scholarship – (SWI) Investigation of the gene family encoding aquaporins, the protein channels regulating water movement, in wheat	11,250
GRS108	Grains Industry Research Scholarship – (ANU) Characterisation of aluminium tolerance genes in crop plants	12,500

Project	Project Title	2004–05 Expenditure (\$)
GRS29	Grains Industry Research Scholarship – (UQ) Development of durable Johnson grass mosaic virus resistance in sorghum via a transgenic approach	938
GRS56	Grains Industry Research Scholarship – (UWA) Chromosomal regions controlling salt tolerance in wheat and wild relatives	30,000
GRS66	Grains Industry Research Scholarship – (UWA) Interactions between environmental factors and mechanisms involved in preharvest sprouting tolerance in wheat	30,000
GRS67	Grains Industry Research Scholarship – (UA) QTL determination under association mapping	30,000
GRS73	Grains Industry Research Scholarship – (UWA) Synthesis, assembly and turnover of mitochondrial proteins	30,000
GRS74	Grains Industry Research Scholarship – (Swinburne) Identification and evaluation of genetic factors determining grain texture in wheat	30,000
GRS78	Grains Industry Research Scholarship – (RMI) The impact of ingredients, biochemical interactions and processing on the structure and quality attributes of Asian noodles	30,000
GRS84	Grains Industry Research Scholarship – (CSP/UQ) Isolation and characterisation of transcription factors from wheat involved in drought adaptation	30,000
GRS87	Grains Industry Research Scholarship – (RMIT) Enhancing crop utilisation through chloroplast targeted expression of cellulase genes in plants	30,000
GRS89	Grains Industry Research Scholarship – (RMIT) Molecular interactions during preparation of Asian noodles and manipulation of nutritional and organoleptic characteristics	30,000
GXE00003	Barley improvement and industry development	15,914
GXE00004	Conduct a study to identify the cause of mouldy grain at receipt in WA	25,000
ICA1	Technologies for the targeted exploitation of the N I Vavilov Institute of Plant Industry (VIR), ICARDA and Australian bread wheat landrace germplasm for the benefit of the wheat breeding programs of the partners	150,000
PDF18	Post doctoral Fellowship Award – (UA) to study evaluating genome structure manipulation for improving wheat (<i>Triticum aestivum</i> L.) and canola (<i>Brassica napus</i> L.) transformation	65,279
RWF00001	Development of a 'business plan' for barley breeding in Australia	35,000
RWF00002	Development of a business plan and recommendations for wheat breeding in Western Australia.	40,000
RWF00003	Develop a business plan for a proposed northern region wheat breeding organisation for QDPI, NSW-DPI and GRDC	40,000
SPS2	SunPrime Pty Ltd – expenses	56,682
SRF2	Malting Barley Quality Improvement Program	250,000
TMP164	Wheat breeding – national	104,914
UA00003	Identification of resistance mechanisms to barley black point	37,200
UA00006	New systems for the functional analysis of cereal genes.	55,000
UA00007	Transformation in functional genomics and cereal improvement programs	371,315
UA00014	Improving stability of pigments and noodle colour via reduction in wheat	87,974
UA00030	Barley improvement and industry development	97,000
UA00031	Barley improvement and industry development – UA (feed)	300,669
UA00032	Barley improvement and industry development – UA (malt)	704,418
UA00034	Defect elimination in wheat	127,308
UA00037	Defect elimination in wheat	110,768
UA00039	Defect elimination in wheat	10,549
UA00050	Australian Winter Cereals Molecular Marker Program – Component: Whole genome based selection in backcross families in wheat and barley	250,000
UA00058	Barley improvement and industry development	216,320
UA00063	Breeding for frost tolerance in barley	124,311

Project	Project Title	2004–05 Expenditure (\$)
UA00064	Triticale improvement and industry development – Component 1 University of Adelaide	–45,512
UA00076	Improving adaptation of wheat to hostile soils: quantifying the importance of traits and targeted germplasm development	100,000
UA00077	Characterisation and recombination of wheat grain components that determine colour and colour stability in Asian noodles	109,438
UA00078	AWCMMP – Component: MBQIP implementation and validation	250,000
UA00080	AWCMMP component – association mapping	260,026
UA00083	Cereal Functional Genomics Centre	600,107
UA00085	Defect elimination in wheat	50,000
UA538	Relocation of wheat biochemistry research program to the University of Adelaide	142,238
UA546	Map-based cloning of quantitative trait loci in barley	16,000
UHS88	Undergraduate honours scholarship – (SWI) Genetic basis of grain hardness: assessment of the puroindoline and GSP-1 genes in synthetic wheats and land races	6,000
UMU00019	AWCMMP component project – Rice-wheat-barley comparative genomics for key agronomic traits	100,000
UQ123	A strategic framework to model CIMMYT wheat breeding programs with application to Australia – University of Queensland component	108,940
UQ157	Enhanced evaluation of CIMMYT germplasm for Australia (continuation) – Australian component	30,000
UQ158	Development of ICIS for Australian wheat breeding programs	50,000
US00022	Rye – new products for industry	7,500
US00026	The cell biology of cold-induced male sterility in wheat	108,396
US00030	AWCMMP Phase 2 Component project – Markers for rust resistance in cereals	50,210
USQ00002	Evaluation of transgenic wheats for frost tolerance	110,662
USQ00004	Data mining and linkage map curation in the Australian Winter Cereal Molecular Marker Program	20,000
USQ00007	Australian Winter Cereals Molecular Marker Program – Component: Molecular markers for high priority traits in winter cereals for the Northern Region	400,000
UT00006	Understanding and market targeting the fermentability of Australian malt	60,000
UT8	Australia China collaboration on barley genetic resources	461,560
UWA00011	Barley improvement through germplasm introduction, evaluation and development; a component of the Western Region Barley Improvement Program.	129,792
UWA340	Improvement of waterlogging and salt tolerance in wheat using doubled haploids from crosses with international germplasm and wide crosses	82,502
UWA398	Development of a salt-tolerant cereal using 'wide crosses' of wheat	157,902
VF66	Visiting fellowship award (US) – Characterisation of rust resistance sources for the enhancement of wheat germplasm	16,856
VR24	National Variety Trials (NVT) combined budget	397,423
WCI01.6	National Variety Trials	24,766
WCI27	Curation and management of genetic resources for the Australian grains industry.	5,236
WCI38	Australian wheat quality improvement program – Coordination and forum	4,070
WCI4	WCI project development	2,250
WCI43	High amylose wheat	32,000
WCI44	Products and markets for low protein wheat and soft wheat – workshop	16,574
WCI48	Winter cereal improvement business development activities	46,517
WCI50	Business case for purchasing option from Crop Design	87,796
WCI52	AWCMMP Communications Project	41,591
Total Winter Cereal Improvement		33,924,166

Project	Project Title	2004–05 Expenditure (\$)
CROP IMPROVEMENT		
ACA5	Contribution to ACIAR project – CS1/1999/072 Oilseed Brassica Improvement in China, India and Australia	170,000
AGN2	Economic analysis and agronomic evaluation of canola in the southern region of NSW focusing on profitability.	45,244
CAA00003	Growing western canola technology	150,000
CI20	National Pulse Initiative – Pulse germplasm enhancement	6,051
CI29	Lupin (NLL) breeding – capital component	190,000
CI37	Patent cost–novel male sterility system in canola	1,878
CI38	Crop improvement business development activities	19,629
CSP338	National soybean improvement	570,128
DAN00034	Northern Faba Bean Improvement Program	344,548
DAN00052	Development of chickpea genotypes and improved agronomic practices for chickpea, faba bean and mung bean in northern NSW	114,103
DAN00053	Canola and mustard in northern NSW	105,075
DAN00063	National Brassica Improvement Program – Component 2: NSW DPI	260,000
DAN00065	Northern desi chickpea breeding program	472,588
DAN00066	More profitable chickpeas through disease management – Northern Region	100,000
DAN442	Pulse development and disease management – Northern NSW	15,021
DAN463	Cultivar evaluation and management of pulses in southern NSW	209,574
DAQ00014	Sorghum crop improvement – manipulating height for yield advance in sorghum	49,928
DAQ00015	Crop Improvement of Grain Sorghum in Australia – core breeding	555,461
DAQ00023	Adoption of best management practices in high input peanut production systems	126,744
DAQ00060	National Mungbean Improvement Program	154,338
DAQ00061	Agronomic solutions for Queensland pulse growers	174,841
DAQ00062	Cloning of an insect resistance gene from sorghum	130,926
DAQ00070	Australian Peanut Improvement Program	400,000
DAQ00073	Implementing technologies and strategies to maintain resistance to sunflower rust	178,679
DAQ00076	Integrating crop improvement technologies for rapid genetic advance	412,596
DAQ520	Physiological dissection of stay-green QTLs in sorghum	134,400
DAQ532	Maize germplasm enhancement for eastern Australia	130,000
DAR00001	Strategic investment in the development of Diversity Arrays Technology	386,408
DAS00007	Cell culture technology to advance disease resistance breeding in pulses	114,695
DAS00013	Vetch variety improvement for Australian field crop farming systems	193,254
DAS00050	Lupin evaluation – SA/Victoria node	80,006
DAS330	Australian Coordinated Pea Improvement Program (ACPIP) – SA	305,927
DAV00005	Strategic acquisition of germplasm and information for lentil and chickpea and their crossable wild relatives, for priority trait breeding.	160,106
DAV00057	Pulse agronomic research for the development of variety specific management packages in south eastern Australia	160,040
DAV00060	National Brassica Improvement Program – DPI Victoria and lead agency	346,288
DAV434	Coordinated Improvement Program for Australian Lentils (CIPAL)	615,047
DAV451	Coordinated improvement of chickpea in Australia – South East Region	282,336
DAV455	Australian Coordinated Field Pea Improvement Program – DPI Victoria	465,033
DAV479	Canola molecular marker proposal	430,400
DAW00075	Interaction of nitrogen with other nutrient elements for production of canola grain and oil	102,000

Project	Project Title	2004–05 Expenditure (\$)
DAW00099	Lupin agronomic improvement in the Western Region – enhancing the profitability of the lupin/wheat rotation	231,962
DAW00100	Pulse industry extension – expanding pulse cropping by targeted extension of improved varieties and management packages	248,248
DAW00101	Evaluation and selection of high quality Brassica breeding lines for short season environments of Western Australia	149,524
DAW00102	Development and implementation of molecular markers for lupin breeding	166,738
DAW00104	Yellow lupin improvement	307,374
DAW00105	Western Lupin Technology (narrow-leaved lupin breeding for southern Australia)	708,124
DAW706	Breeding of chickpea for the Western Region	62,100
DAW707	Breeding field peas for the Western Region	73,096
EOP00001	Can we identify and overcome constraints to canola production on growers' paddocks?	77,671
FLR00001	Canola yield decline: expanding the regional focus and disease emphasis using surveys, simulation studies and targeted soil/plant analysis	66,658
GRS44	Grains Industry Research Scholarship – (John Innes) Chickpea starch structure and functionality studies	10,000
GRS52	Grains Industry Research Scholarship – (RMI) Discovering novel genes controlling the resistance response to Ascochyta blight in chickpeas	17,500
GRS63	Grains Industry Research Scholarship – (ULA) – Development pathways in arabidopsis pollen and anther regulated by myb genes	35,000
GRS71	Grains Industry Research Scholarship – (ULA) Functional characterisation of myb genes involved in the control of anther and pollen development	30,000
GRS77	Grains Industry Research Scholarship – (UM) Factors affecting yield decline in canola	30,000
GRS83	Grains Industry Research Scholarship – (ULA) Pollen development in plants	30,000
MAA00002	Publication of COB Magazine	10,000
MAA00003	Travel support to teach MaizeMan	1,500
MCP00002	Refinement of best management practices for chickpea and mungbean in north-western farming systems	118,926
PAL00007	Crop support for the Northern and Southern Region	331,910
PDF38	Post Doctoral Fellowship Award – (UWA) to study characterisation and evaluation of wild Cicer genetic resources to accelerate chickpea improvement in Australia	89,264
PDF47	Post Doctoral Fellowship Award – (UM) to study the Sclerotinia stem rot of oilseed brassicas: molecular mechanisms involved in infection	93,623
PDF48	Post Doctoral Fellowship Award – (UM) to study lowering of nutritionally undesirable saturates in <i>Brassica napus</i> and <i>Brassica juncea</i> oils using post transcriptional gene silencing	82,415
SGA00001	Business plan for the Australian canola industry	43,000
UA00079	Faba bean breeding – Southern and Western Regions	470,507
UHS91	Undergraduate honours scholarship – (CUR) Alternative oilseed crops for the low rainfall cropping regions of the grainbelt of Western Australia	6,000
ULA00006	A novel male sterility system for canola and wheat	133,200
UM00015	Epidemiology and control of Botrytis grey mould in lentils	21,028
UM00020	Strategies to ensure longevity of blackleg disease resistance genes in canola	135,000
UQ00035	Professorial Chair in Crop Science and Innovation	70,000
UT00004	Grain legume and oilseed evaluation in Tasmania	142,325
UWA00009	Improved lupin grain quality and yield through genetic manipulation of key physiological traits	99,986
UWA00035	International collaboration to develop robust protocols for doubled haploid production in field pea and chickpea	152,952
UWA00036	An international collaboration to develop interspecific hybrids between chickpea and its wild annual relatives	114,972

Project	Project Title	2004–05 Expenditure (\$)
UWA00042	Improving lupin tolerance to Metribuzin and developing germplasm with tolerance to the new herbicides, Balance and Affinity	101,981
UWA00043	The potential of the pearl lupin (<i>Lupinus mutabilis</i>) for southern Australia	49,222
UWA356	Rapid recurrent selection to improve resistance to black spot in peas	12,500
UWA368	Rapid screening techniques to select canola for drought resistance and high oil concentration.	-10,784
UWA372	Development of molecular marker and mapping technology for lupin breeding: UWA Component. Comparative mapping across lupin species and between legume genera	72,969
Total Crop Improvement		13,449,784
CROP PROTECTION		
ABT00002	Improving knowledge on best practice practical use of MOUSEOFF zinc phosphide for in-crop mouse control	136,695
ACC00003	Plant growth regulators and their agronomic and economic benefits to high yield potential cereal, pulse and oilseed crops.	31,830
ACC00004	Aschochyta and botrytis management in lentils with pre and post emergent fungicides.	42,440
ACR4	IWM as a tool to prevent herbicide resistance becoming an impediment to sustainable farming	22,600
AGL00002	Business case for the Australian Centre for Plant Biotic Stress	34,507
AKC00001	Registration for minor use chemicals for the grains industry	126,000
ANU00002	Lectureship in Plant–Microbe Interactions	51,864
ANU19	Development of specific microbial and transgenic technology to control fungal pathogens: a commercialisation project based on patent application no PP8394/99	150,319
BGP00001	Releasing agricultural weed seed dormancy through application of a novel smoke derived chemical	70,010
BWD00005	Improved techniques for managing herbicide resistant ryegrass	188,750
CIM13	Australian Cereal Rust Control Program – Adult plant resistance and introgression of new and novel genes	356,000
CP28	WA crop protection genomics	1,821
CP29	National invertebrate pest initiative	2,539
CP46	Crop protection business development activities	17,818
CRW5	CRC for Weeds	750,000
CSE00010	Risk analysis for biosecurity of the grains industry	141,988
CSE00027	Insecticide resistance and sustainable management of aphids	120,700
CSE00028	Natural enemy evaluation of the silverleaf whitefly and ecological processes affecting SLW dispersal	100,000
CSE00029	National Pest Initiative	310,986
CSE167	Prospects for biological control of weeds of cropping	84,100
CSE193	Grain protection genes	2,000,000
CSP00007	Molecular relationships in the rust fungi particularly the family Pucciniaceae	117,598
CSP00012	New disease protection for wheat – a block of genes for resistance to BYDV, RLN and rusts plus potential yield boost.	165,421
CSP00017	Australian Cereal Rust Control Program – Molecular discovery	542,139
CSP00061	Analysis of the regulation of plant defence/stress gene expression	76,665
CSP335	On-farm management to reduce ergot levels in grain sorghum	85,000
CSP345	Novel approaches for engineering herbicide tolerance	18,400
CSP386	Epidemiology and pathogenicity of <i>Fusarium</i> in relation to crown rot	132,219
CSV16	Biological control of mice – immunocontraception	296,275

Project	Project Title	2004–05 Expenditure (\$)
DAN00018	The biological control of two-spotted mite in irrigated maize	63,627
DAN00023	Viruses and vectors in the Northern Region: support for resistance breeding and information for integrated control	159,141
DAN00067	Differential herbicide tolerance of winter crops in SE Australia – Stage 2	136,900
DAN00068	Integrated disease management in field crops with emphasis on Sclerotinia stem rot in canola	60,000
DAN474	Canola pathology support in southern NSW and northern Victoria	99,084
DAN485	Management of Fusarium diseases and common root rot of cereals in the northern cropping zone	262,600
DAQ00003	Integrating IPM for major insect pests of pulses, soybeans, and peanuts (Pulse IPM MkII)	136,553
DAQ00027	Screening for differential herbicide tolerance in cultivars of winter cereals in NR	70,000
DAQ00029	Emerging and emergent winter cereal disease issues in the Northern Region	131,028
DAQ00056	Development of an area-wide decision support system for whitefly management in central Queensland cropping systems	130,776
DAQ00059	Minimising the impact of pulse diseases in Queensland	128,055
DAQ00064	Delivering applied solutions to weed issues in central Queensland	102,774
DAQ00065	Cropping option to limit root lesion nematodes	107,203
DAQ00074	Facilitating adoption of IPM in northern region broadacre farming systems	150,000
DAQ00079	Modelling for sustainable glyphosate use in the northern region	55,000
DAQ00083	Integration of biopesticides into IPM against sucking pests (DAQ540 phase II)	62,675
DAQ566	Genetic approaches to resistance to Fusarium and Bipolaris in wheat and barley	132,646
DAS00003	Developing annual medics tolerant to residues of sulfonylurea herbicides	95,494
DAS00031	Incorporating new sources of stem and leaf rust resistance from wild oat species into cultivated oat varieties	96,092
DAS00032	Crown rot management in durum and bread wheats for the Southern Region	157,504
DAS00034	Diagnostic support to crown rot strategic initiative	62,846
DAS00041	Pathology support for pulse crops in southern region – SA module	92,700
DAS00048	Control of cereal fungal diseases	190,000
DAS00054	Management of Etiella in lentils in southern Australia	70,000
DAS300	Integrated snail management in the southern region	184,574
DAV00048	Victorian pulse pathology and virology support program	113,300
DAV00062	Victorian cereal pathology support with emphasis on crown rot management	175,000
DAV454	Management strategies for the use of foliar fungicides in cereals	56,568
DAW00018	Biological hazard – predicting and managing spread of diseases and insects	75,508
DAW00027	Evaluating herbicide tolerance with new crop varieties	132,858
DAW00028	Management of dodder – a new parasitic weed in WA cropping systems.	55,125
DAW00030	A farming systems approach to sustainable management of root lesion nematodes in Western Australia	159,103
DAW00041	Improving the management of diamondback moth (<i>Plutella xylostella</i>) in canola in the Western Region	163,018
DAW00106	Managing disease constraints in western region farming systems	770,080
DAW00114	Applied weed management in Western Australia	240,500
DAW710	Influence of potassium on leaf diseases of cereals	52,450
DAW753	Grain pest management for changing farming systems in high rainfall areas	150,000
DNR00003	Mouse management research in Queensland	86,500
ELD00002	Determination of best management practices for multiple wheat diseases in the northern agricultural zone of WA	43,938

Project	Project Title	2004–05 Expenditure (\$)
GRD196	Helicoverpa Genome Project Business Plan	10,000
GRD196	Helicoverpa Genome Project Business Plan	-5,000
GRS35	Grains Industry Research Scholarship – (DAS/UA) Discovery of genes associated with the barley response to fungal pathogen attack	3,750
GRS49	Grains Industry Research Scholarship – (UF) – Characterisation of the molecular interactions of endophytic actinomycetes in cereal crops	30,000
GRS58	Grains Industry Research Scholarship – (UWA) Analysis of a key family of plant detoxifying genes important for plant stress tolerance and herbicide resistance	36,250
GRS62	Grains Industry Research Scholarship – (UWA) – Genetic analysis of plant defence signalling pathways	35,000
GRS70	Grains Industry Research Scholarship – (UQ) Pathotypes, epidemiology and economic importance of sorghum rust (<i>Puccinia purpurea</i>) in Australia	30,000
GRS72	Grains Industry Research Scholarship – (ANU) Overcoming cereal root diseases that are induced at low temperatures	30,000
GRS80	Grains Industry Research Scholarship – (UM) How long can Australian agriculture neglect fortuitous biological control as a sustainable provider of pest control?	30,000
GRS81	Grains Industry Research Scholarship – (US) Genetic and pathogenic variation in field population of the crown rot fungus (<i>Fusarium pseudograminearum</i>)	30,000
GRS82	Grains Industry Research Scholarship – (UMU) Disease resistance to Phytophthora in <i>Medicago truncatula</i>	30,000
GRS85	Grains Industry Research Scholarship – (UWA) The biology and control of <i>Salsola tragus</i>	30,000
GRS86	Grains Industry Research Scholarship – (UWA) Comparison of an aphid resistance trait in three near isogenic cultivar pairs of barrel medic (<i>Medicago truncatula</i>) to the bluegreen (<i>Acrythosiphon kondor</i>) and pea (<i>Acrythosiphon pisum</i>) aphids	30,000
GRS88	Grains Industry Research Scholarship – (UM) Biosynthesis and role of fungal toxins in blackleg disease of canola	30,000
GRS94	Grains Industry Research Scholarship – (CSP/UQ) Wheat with reduced Fusarium toxin production	30,000
GRS99	Grains Industry Research Scholarship – (UMU) Metabolism and infection in the <i>Stagonospora nodorum</i> –wheat pathosystem	13,750
IPM00001	Management of slugs in cropping systems	125,000
JLC34	National Branched Broomrape Communication Strategy	28,000
PDF24	Post Doctoral Fellowship Award – (UT) to study investigating the below-ground competitiveness of grain-crop varieties as a weed control strategy	44,329
PDF30	Post Doctoral Fellowship Award – (UMU) to study peroxisomal metabolism in fungal pathogenesis	32,407
PHA1	Farm biosecurity and incursion management framework for the Australian grains industry	99,100
SFS00006	Optimising economic yield responses through disease management in winter cereals	379,937
TMP175	Crown rot strategic initiative	1,615
UA00002	Mechanisms of resistance during interactions between barley and different forms of <i>Pyrenophora teres</i>	69,000
UA00060	Developing management systems for brome grass, a serious threat to production systems on fragile sandy textured soils in southern Australia	154,462
UA00061	Development and evaluation of weed competitive wheat cultivars	240,244
UA00070	Advancement of new genes for stem and leaf rust resistance from uncultivated relatives of wheat	150,013
UA00071	Control and eradication of a parasitic weed, field trials	174,963
UA00075	Managing the risks of trifluralin resistance in no-till cropping systems	115,587
UA543	Understanding and management of weed resistance to glyphosate	125,449

Project	Project Title	2004–05 Expenditure (\$)
UHS89	Undergraduate Honours Scholarship – (US) Population studies of <i>Gibberella zeae</i> (<i>Fusarium graminearum</i>) on crop and alternate hosts in eastern Australia using molecular techniques and pathogenicity testing	6,000
UHS92	Undergraduate Honours Scholarship – (DAV) Evaluation of blackleg pathotypes infecting <i>Brassica juncea</i> in south-eastern Australia	6,000
UM00016	Fungal pathology developments for management of diseases of oilseed Brassicas in Australia	123,507
UM00021	Monitoring populations of the blackleg fungus to develop strategies for deployment of resistance genes in Oilseed Brassicas	103,300
UM00022	Emerging mite pests in southern Australia	91,984
UMO00002	Source and resistance status of outbreak populations of diamondback moth in Western Australian canola	94,473
UMU00022	Australian Centre for Necrotrophic Fungal Pathogens	260,900
UMU103	Virulence and genetic variability in the spot-type net blotch pathogen of barley in Western Australia	16,000
UMU88	National program for foliar diseases caused by necrotrophic fungal pathogens	283,793
UNE62	Field studies and management of crown rot in the northern region	95,484
UQ00016	The molecular and biological characterisation of ascovirus as a potential biological control for <i>Helicoverpa</i>	121,475
UQ00029	Population genetics of <i>Helothis</i> migration, recruitment and origins	129,180
UQ00032	Advanced application technology to manage spray drift and improve the efficacy of weed management practices	100,000
UQ166	Development of decision support models for weed containment and eradication	22,520
US00028	Adult plant resistance and pathogen variability in cereal rust: cereal host pathosystems	218,080
US315	Australian Cereal Rust Control Program	1,002,455
US316	Intermediate hosts and the management of crown rot and head blight	106,510
UWA00038	Genetic dissection of fungal disease resistance in legumes using <i>Medicago truncatula</i>	451,552
UWA00041	Feasibility study to evaluate potential biocontrol agents (parasitic wasps) for sustainable management of diamondback moth (DBM) in canola	35,000
UWA00073	Economic analysis of GRDC investment in herbicide use	74,587
UWA369	Agro-ecology of marshmallow (<i>Malva parviflora</i>) in Western Australian farming systems	6,000
UWA399	Western Australian Herbicide Resistance Initiative (WAHRI)	601,029
VF80	Visiting Fellowship Award – (DAN) Development of rapid diagnostics for identification and differentiation of endemic and exotic yellowing viruses in faba beans in northern NSW	14,000
Total Crop Protection		17,483,590
SUSTAINABLE FARMING SYSTEMS		
AGH00001	Preparation of Precision Agriculture manual	16,500
AGR00002	Robocrop business case – construction of a prototype seedn'weed tillage bar	350,300
AMP1	Identifying and managing nutrient imbalances in high-yielding cropping systems on the Liverpool Plains, NSW	25,683
AWR8	Contribution towards the National Annual Pasture Legume Improvement Program	-292,632
CAG00002	On farm evaluation of frost minimisation techniques and risk management strategies	66,000
CFI00008	Precision Agriculture Initiative – Farming Systems Research Group (Northern Region)	49,500
CFS00002	Farming systems improvement in the Upper North of South Australia.	75,000
CHC24	An investigation into the hydrogeological transport of atrazine in soils of the Western Australian wheat-belt	146,633
CSA00007	Province, paddock or patch? Giving farmers tools to optimise the scale at which fertiliser decisions are made	50,000

Project	Project Title	2004–05 Expenditure (\$)
CSA3	National Annual Pasture Legume Improvement Program – Queensland Component	202,592
CSO00004	Objective measures for managing the risk of deep drainage	100,654
CSO00007	Addressing the soil supply factor to improve prediction of plant nutrient requirements	152,291
CSO00009	Commercial development of the drainage meter	92,400
CSO00013	Identifying herbicide impacts on N fixation of pulses	135,814
CSO00016	Integrated management of Pythium root disease complexes to improve sustainability and productivity of crop rotations	180,481
CSO00017	Precision Agriculture Initiative	251,290
CSO00028	Management of soil microbial function for improved productivity in intensive cropping systems	182,922
CSO00029	Residue management, soil organic carbon and crop performance	199,991
CSO00030	Developing improved capacity to predict N supply to crops	429,948
CSO00031	Innovative solutions to subsoil constraints for a profitable and environmentally sustainable grains industry in WA	105,100
CSO00033	Farming systems options and catchment salinity response	96,315
CSO00034	Improving farm to catchment nutrient management for a more profitable and environmentally sustainable grains industry	100,632
CSO00036	Scoping study to review current research on microbe–plant interactions in the rhizosphere and identify priorities for future investment	50,000
CSO202	Management of irrigated maize residues	60,000
CSO212	Defining agricultural management strategies that optimise water and nutrient use in Mallee environments of southern Australia	100,675
CSO216	Identifying and overcoming biophysical constraints limiting profitability of Mallee farming systems	186,694
CSO231	Fluid fertilisers – the next step towards raising yield potentials	438,425
CSO232	Managing the fallow period for optimum water use and nitrogen availability	104,451
CSO236	Reduction in nitrogen fixation by legumes following ALS herbicide application: susceptibility of common pasture and grain legumes and mode of impact	14,390
CSP00009	Increasing farm profits in the high rainfall zone using mixed cropping/grazing systems based on winter wheats	192,256
CSP00015	Improving wheat yields and quality in Western Australian sandplain farming systems	215,223
CSP00040	Can we forecast seasonal wheat grain yields and protein in Western Australia?	85,377
CSP00049	Evaluating the use of subsoil water by crops – is it the pipes or the pump?	147,975
CSP00050	Quantifying the effect of hydrogen gas on soil biota and crop performance	239,427
CSP00056	Nutrient management: improving manage wheat and the lime and nutrient balance decision support systems	60,000
CSP245	Biological activity and organic matter in no-tillage systems and their contribution to crop production – Component 1	100,200
CSP291	Optimising crop performance through innovative phase farming systems – new approaches to improve the nitrogen supply and management of the hydrological balance for crops in wet environments	77,615
CSP302	Unlocking the potential for crops in higher rainfall areas in the western region	70,000
CSP318	Citrate-secreting break crops to unlock the fixed-P bank in rotations	74,253
CSP329	Improving the conceptual framework of below-ground biology using new microscopy techniques to study root/soil/microbe interactions – a focus study on inhibitory bacteria in direct-drilled wheat	206,553
CSP337	Improved crop yield after a perennial grass pasture	11,386
CSP342	Wheat variety evaluation for irrigation in the Southern Region	200,693
CSP343	Identifying and evaluating ‘primer crops’ for hostile subsoils	74,870

Project	Project Title	2004–05 Expenditure (\$)
CTF00002	Precision Agriculture Initiative	180,000
CWF00002	Central West Farming Systems – Farmers Advancing Research	308,884
CWF00004	Low rainfall farming systems collaboration	149,100
CWF00005	Combating subsoil constraints	69,575
DAN00002	Permanent beds for sustainable farming on irrigated farms	45,614
DAN00051	Development of sustainable and profitable farming systems for the Western Plains of NSW	2,141
DAN00054	Precision Agriculture Initiative	109,480
DAN337	Better lucerne rotations for sustainable	2,908
DAN349	MASTER – Managing Acid Soils Through Efficient Rotations	9,911
DAN403	A new and innovative approach to increasing nitrogen supply to crops in phased farming systems	59,121
DAN407	Water efficient cropping and pasture systems for hydrologic stability on the Liverpool Plains and adjacent slopes of New South Wales	7,205
DAN454	National Annual Pasture Legume Improvement Program – Phase II – acid soils (east) zone	146,315
DAN484	Breeding improved lucernes for cropping systems in eastern Australia – Phase II	229,266
DAQ00006	Whopper Cropper – a risk management learning tool for advisers	96,000
DAQ00048	Identification of soil biotic constraints in contrasting farming systems on Vertosols of the northern grains region	281,665
DAQ00049	Sustainable farming systems for central Queensland	693,157
DAQ00050	Enhancing system water-use efficiency in the north eastern grains belt through participatory RD&E (EFS Phase II)	530,439
DAQ00063	Viable and sustainable farming systems on Ferrosols	192,200
DAQ00067	Precision Agriculture Initiative – eye in the sky to revolutionise northern crop production	143,245
DAQ00084	Nutrient management in rainfed cropping systems of the northern grains region	271,283
DAQ499	Sustainable farming systems for the marginal cropping areas of SW Queensland – Phase 2	401,633
DAS00012	Improved yield and yield quality through amelioration of degraded subsoil	196,268
DAS00017	Reducing the impact of climate variability	170,311
DAS00027	Soil biology R&D initiative	99,314
DAS00035	Managing diseases using Precision Agriculture	149,800
DAS00036	TRINOC™: tri-inoculation for enhanced wheat growth under disease limiting conditions	112,642
DAS00040	The seed increase and distribution of perennial legumes to support sustainable and productive farming systems	60,000
DAS00042	Pathology support for annual pasture legumes	81,426
DAS324	National Annual Pasture Legume Improvement Program – South Australian component	281,377
DAS347	Breeding lucerne for Southern Australian cropping districts	197,370
DAV00006	Tools to reduce the impact of climate variability in south eastern Australia	205,620
DAV00020	A profitable future: new rotations for low rainfall environments	249,960
DAV00021	Adopting profitable pasture: crop rotations: on-farm research across the high rainfall zone of Victoria.	116,423
DAV00022	Maintaining the productivity of soils under continuous intensive cropping	185,704
DAV00030	Precision Agriculture Initiative	200,026
DAV00049	Improving the profitability of cropping on hostile subsoils	553,756
DAV00051	Preparing for environmental management systems in the Australian grains industry	149,776
DAV00056	Understanding subsoil constraints in the HRZ	51,706
DAV00059	Management of high rainfall cropping to improve water quality and productivity	198,378

Project	Project Title	2004–05 Expenditure (\$)
DAV00061	Genotype and management combinations for highly productive cropping systems in the HRZ	306,052
DAV417	Environmental impacts of raised bed cropping systems in south west Victoria	88,108
DAV437	Novel farming systems to increase productivity and reduce risk in the Mallee	151,925
DAW00002	Management of compacted soils in the Western Region	211,712
DAW00010	Developing and delivering decision support systems for soil fertility management and plant nutrition in WA.	76,000
DAW00014	Development and extension of new methodologies to treat subsurface acidity – maximising the benefits of removing subsurface soil constraints.	132,613
DAW00031	Evaluation and cultivar selection for herbicide tolerance in annual legume pastures	79,988
DAW00032	Improving weed management with biserrula in the pasture phase of WA cropping systems.	85,664
DAW00040	Promoting tools for assessing and managing seasonal conditions in dryland crop production.	39,209
DAW00084	Diagnostic support and training for Precision Agriculture	95,637
DAW00087	Better long-lead seasonal and crop forecasts for southern Australia	131,433
DAW00088	Climate change, wheat yield and cropping risks in Western Australia	148,848
DAW00093	Identifying soil constraints to crop production on the south coast sandplain	117,200
DAW00103	Measurement of paddock-based greenhouse gas emissions from wheat production to improve life cycle assessment of wheat-products	98,823
DAW672	Rapid adoption of a systems approach to weed management in the northern agricultural region of Western Australia	166,464
DAW673	Increasing productivity of southern high rainfall cropping systems	168,273
DAW717	Soil and surface water management for profitable crops and pastures on waterlogged and saline land	142,500
DAW723	Coordinator for the National Annual Pasture Legume Improvement Program (NAPLIP)	31,181
DFT1	Coordination of GRDC water balance R&D and collation of results	26,015
DNR00002	Improving water quality in grain farming catchments	246,054
DNR00004	Combating sub-soil constraints	513,531
FLR00002	FarmLink: Supporting the establishment of a new farming systems groups for southern NSW	307,120
GRD174	Strategy for commercialisation of soil biology research outcomes and future negotiations for BIPF	93,905
GRD178	Agritech Hydropower	4,547
GRS102	Grains Industry Research Scholarship – (UWS) – Managing competitive rhizobial populations of low effectiveness in NSW chickpea cropping soils	10,000
GRS106	Grains Industry Research Scholarship – (UMU) Regulation of nitrogen fixation in <i>Sinorhizobium meliloti</i> on the annual pasture legume Medicago	11,250
GRS109	Grains Industry Research Scholarship – (UWA) Physiological and molecular basis of salt tolerance in <i>Lotus glaber</i> , a new perennial pasture legume for Australian farming systems	12,500
GRS65	Grains Industry Research Scholarship – (UWA) Economics & policy mechanisms for salinity management in Western Australia	30,000
GRS68	Grains Industry Research Scholarship – (UMO) The impact of organic amendments on phosphorus availability in acid cropping soils	30,000
GRS69	Grains Industry Research Scholarship – (UNE) Development and application of a decision framework for the introduction of plant based solutions to salinity and relevant policy	30,000
GRS90	Grains Industry Research Scholarship – (US) Precision Agriculture and whole farm planning for sustainability	30,000
HFG00002	Measuring and managing spatial variability at the Hart site and increasing economic returns from cropping in higher rainfall situations	59,500

Project	Project Title	2004–05 Expenditure (\$)
HRD1	Coordination of the National Cadmium Minimisation Strategy	15,000
KDI00015	Conduct a scoping study for potential investment in agricultural engineering R&D for the Australian grains industry	41,250
LIE00003	A sustainable dryland community achieved through proactive research on effective management of the soil resource	143,015
LWR23	GRDC's contribution towards Grain and Graze program	517,000
LWR25	GRDC Contribution towards Managing Climate Variability program	649,931
MFM1	Increasing cropping skills, yields and area in the south east of South Australia	30,900
MSF1	Mallee sustainable farming project	577,353
NMS00002	Adoption of improved nutrient management practices	150,000
RJH00001	National Output Development and Evaluation Project – Soil Biology Initiative	119,900
RPI00003	Zonal management in the riverine plains	50,500
SFP23	National Rhizobium Program review	1,000
SFP25	Sustainable Farming Systems business development activities	17,161
SFP8	Precision Agriculture Initiative – administrative costs	10,520
SFP9	Precision Agriculture supplement for <i>Ground Cover</i>	6,792
SFS00007	Raised bed cropping methods – Impact on crop yields and plant water use	174,089
SFS00013	Coordination of GRDC's high rainfall zone investment	93,805
SFS3	Farming systems support for southern farming systems	24,200
SFX00001	Gammadiometric & EM31/38 data acquisition and distribution for Precision Agriculture	14,040
SFX00002	Support for Precision Agriculture initiative and testing of stability zones and pseudo harvest index measures across core sites	57,500
SYP00005	Development of best practice farming systems for medium rainfall alkaline soils	152,580
UA00023	Improving farming systems for the management of transient salinity and risk assessment in relation to seasonal changes in southern Australia	171,506
UA00062	Biological cycling of P in farming systems – towards an improved capacity for managing P supply to grain crops	206,460
UA00081	Determining the benefits of fluid fertilisers on neutral and acidic soils in eastern and western Australia	50,407
UA457	Eyre Peninsula farming systems	572,182
UCS00003	Sequencing crop rotations that best utilize lucerne biopores to control groundwater recharge and maintain dry catchments.	68,844
UF00002	Soil Biology R&D Initiative	420,640
UHS87	Undergraduate Honours Scholarship – (UWA) Native herbaceous perennials for recharge control: feed quality of potential legume components	6,000
UHS90	Undergraduate Honours Scholarship – (UWA) The effect of subsurface waterlogging on wheat fertile tiller formation	6,000
UM00023	Synchronising nutrient supply and crop demand in modern cropping systems	177,528
UM148	Changes in soil properties under raised bed cropping	16,399
UMU00003	National Rhizobium Program – developing and delivering high quality rhizobial inoculants to the Australian grains and pasture industries.	433,048
UNE00009	Chair in Sustainable Grain and Grazing Farming Systems	79,255
UQ163	Pathology support for lucerne improvement including germplasm enhancement	107,600
US00017	Precision Agriculture Initiative	183,012
US00033	Development of a multi-sensor platform for real-time collection of field soil data	39,158
UWA00005	Improving the utilisation of pasture germplasm by the development of a core collection using ecogeographical and molecular techniques	75,020
UWA00031	Optimising potassium cycling in soils and crops for improved grain production in WA	97,123

Project	Project Title	2004–05 Expenditure (\$)
UWA00040	Germplasm collection of <i>Trifolium</i> and other pasture legume species from short season, low latitude regions in the Mediterranean	18,000
UWA00058	Biological indicators of soil quality	35,000
UWA00081	Combating sub-soil constraints: unlocking crop potential through innovative sub-soil management	349,006
UWA00083	Lectureship (Level B) in Pasture Science at UWA	40,012
UWA00084	Profitable and sustainable nutrient management in the WA grain industry	100,000
UWA360	National Annual Pasture Legume Improvement Project – Western Australia	506,479
UWA370	Increased benefits of phosphorus fertiliser through the use of new grain legumes	14,765
UWA395	Overcoming soil biological constraints to yield	198,826
UWA396	High water-use farming systems that integrate crops with perennial pastures – CRC Salinity	92,098
UWA397	National field evaluation and selection of new pasture plants from the salinity CRC to improve hydrologic stability of farming systems – CRC Salinity	500,000
UWA400	Capacity building in crop agronomy	139,463
UWS00006	Optimising rhizobial inoculants and their delivery methods for legumes in the northern cropping region	44,187
UWS00007	Improved management of nutrient and soil water interactions in the northern grain zone	61,371
UWS25	Design and management of farming systems in central-western NSW – model applications	12,731
VF67	Visiting Fellowship Award – (CSA) Improved physiological understanding of canopy development and tillering in cereals	13,500
VF68	Visiting Fellowship Award – (WAN) Situation analysis – decreasing the risk by increasing the rotational options	17,500
VF69	Visiting Fellowship Award – (DAV) Better crops for the high rainfall areas	13,500
VF70	Visiting Fellowship Award – (DAV) Remote sensing for precision nitrogen management in wheat	15,500
WAN00003	Developing and extending innovative, profitable and sustainable no-till farming systems	136,475
WAN6	WANTFA technology demonstration site	300
WWL00001	Bringing it all together for the grains industry – a whole of catchment approach to integrated water management	186,191
Total Sustainable Farming Systems		24,344,550
VALUE CHAIN		
AGL00001	Define traits and scope the market size and market value of the products at farm gate	32,581
ANU00005	GRDC and AWB consultancy on assessment of the long term outlook for grain supply and demand in China	220,335
AWB00006	GRDC and AWB consultancy on assessment of the long term outlook for grain supply and demand in China – AWB contribution	–120,335
AWE00001	Licensing assignment of Graincare	20,000
BRI00027	Objective grain quality testing	1,163,400
BRI00027	Objective grain quality testing	–50,000
BRI00031	Go Grains – driving nutrition communication for the grains industry	340,000
CGF00001	Grain Foods CRC Limited	750,000
CGF00002	Grain Foods CRC Ltd – director fees	13,705
CSE00009	Practical synergism of fumigant action: ethyl formate and carbon dioxide.	134,000
CSE00011	Development of ethyl formate formulation and application technology for grain inloading/in situ/outloading treatment.	152,700
CSE00012	NIR spectroscopic changes in stored grain	132,200

Project	Project Title	2004–05 Expenditure (\$)
CSE00030	Crop Biofactories Initiative	1,200,000
CSE00033	Modelling post-harvest grain development to deliver better storage outcomes for growers	30,700
CSE00034	Identifying the links between time of harvest, on-farm storage and malt quality	35,400
CSE00035	Assessing limits of existing silo bag technology under Australian conditions	162,745
CSU10	Understanding factors that affect grain quality for livestock production	315,000
CUR00003	Bulgur – a potential functional food derived from wheat.	50,702
DAN00025	Targeted resistance monitoring and management (Southern Region)	137,460
DAN00075	Statistical analysis and data mining for the Premium Grains for Livestock Program	45,000
DAQ00004	Resistance monitoring and management – Northern Region	122,030
DAQ00005	Strong resistance to phosphine in Chinese rice weevil	15,938
DAQ00008	Searching for new grain protectants for <i>Rhyzopertha dominica</i>	69,408
DAQ00009	Searching for a rapid grain disinfestant for unsealed silos	69,408
DAQ00010	Efficacy of phosphine fumigation in sealed farm silos	65,328
DAQ00066	Managing mycotoxin contamination of maize	90,077
DAQ00075	Optimising grain yield and quality: integrating high moisture harvesting and grain storage strategies	179,551
DAW00017	Resistance monitoring and management – Western Region	84,429
DAW00117	Lupins for Health workshop	8,725
DAW699	Evaluation and further development of strategies for producing quality grains in Western Australia	87,765
FAT00002	Subsistence to Supermarket II project	10,000
FRD00001	Aquaculture Nutrition subprogram: maintenance of strategic directions, project and infrastructure development, and facilitation of nutrition research and extension across all Australian aquaculture sectors	30,000
GRD176	Establishment of ALFI Commercialisation Project	-800
GRS91	Grains Industry Research Scholarship – (CSIRO Molecular Science) Lignin from various straws as a renewable source of monomer (and other feedstock chemicals)	30,000
JCS00001	PGLP technology transfer and commercialisation – commercial evaluation of new measures of feed grain quality	70,000
JLB2	Premium Grains for Livestock program 2: Component 1. Coordination	110,000
PAL00009	Objective measurement of pulse qualities	127,000
SCA00001	Due diligence on GRDCs potential investment in hi-amylose wheat joint venture	12,540
UNE59	Premium Grains for Livestock program 2: Component 4. Enhancing the nutritive value of grains through processing, storage and identified breeding objectives	25,000
UQ00010	Validation of resistance-gene-specific and quantitative markers of phosphine resistance in stored grain pests.	60,199
US312	Premium Grains for Livestock Program 2: Component 2. Production, storage and distribution of grain samples	118,390
UW00001	Market scoping study for gluten-free foods	40,000
UWA00062	Development of value-added plant protein products for the aquaculture feeds sector	151,572
VC15	Develop a strategic plan for Go Grains	-5,600
VC16	Economic and technical assessment of on-farm quality management technologies	3,783
VC17	Contribution to Premium Grains for Livestock program – MLA, APL, RIRDC, Ridley, and AEC	-220,000
VC18	Objective grain quality testing – project management	1,207
VC21	Objective quality assessment to facilitate pulse trading	538
VC22	Objective quality assessment to facilitate feedgrain trading	621

Project	Project Title	2004–05 Expenditure (\$)
VC27	Commercialisation costs for twist fungus	22,000
VC28	Value chain business development activities	39,232
WJM00002	Development, maintenance and safe use of grain storage chemicals – Component 4 – Co-ordination of registration.	61,438
YEL00001	Facilitating investment in innovative value-adding in Australia's grain industry	909
	Total Value Chain	6,246,280
PRODUCT & SERVICE DELIVERY		
AAA00004	GMOs Guiding Meaningful Opinions	100,000
AAS00002	Conference – AGCON 2005	15,000
AEN00001	Conference support – XXII International Congress of Entomology	10,000
AFQ00002	Northern Region Research Advisory Committee facilitation support	67,700
AFQ00004	Travel Support – to attend the 12th Australian Barley Technical Symposium	1,400
AMC00002	Travel Support – to attend Implementation of Precision Agriculture Conference	3,400
ANU00004	EMS in agriculture: a comparative analysis of initiatives in the European Union and Australia	99,250
ANU18	Australian Centre for Intellectual Property in Agriculture	540,938
ARG00001	Conference Support – 13th Australasian Plant Breeding Conference	19,987
ARL00005	Australian Rural Leadership Program	92,000
ARR00001	Conference support – 1st Australian Fluid Fertiliser Workshop	10,000
ASC00002	Conference support – 5th Australian Sorghum Conference	20,000
ASS00001	Conference support – Super Soil 2004	8,000
ATA33	Agricultural Training Award – to study at Longerenong Campus University of Melbourne	5,000
ATA34	Agricultural Training Award – to study at Longerenong Campus University of Melbourne	5,000
ATA35	Agricultural Training Award – to study at CB Alexander Agricultural College Total	5,000
ATA36	Agricultural Training Award – to study at CB Alexander Agricultural College Total	5,000
ATA37	Agricultural Training Award – to study at CB Alexander Agricultural College Total	5,000
ATA38	Agricultural Training Award – to study at CB Alexander Agricultural College Total	5,000
ATA39	Agricultural Training Award – to study at CB Alexander Agricultural College Total	5,000
AUS00002	GRDC Eureka Prize for Research to Improve the Environmental Sustainability of Grain Growing	20,000
BAE00008	ABARE – Australian agricultural and grazing industries survey	621,000
BAE00011	Conference support – Outlook 2005	5,455
BCA00002	Western Region Communicator 03–06	94,837
BER00002	2003 International Grains Research Review	27,263
BER16	2002 Australian Grains Yearbook – incorporating the GRDC Annual Report to industry	47,837
BER18	2003 National Farm Group Manual and (optional) CD-ROM	129,544
BRI00024	Go Grains Nutrition and Education – Go Grains for health' communication strategy	171,503
BRI00025	Research Horizons and the GRDC/BRI Grower Development Program	455,353
BRS00008	Science and Innovation Awards for Young People in Agriculture, Fisheries and Forestry 2005	2,000
BWD00002	Farm Groups – Innovative Information Exchange	122,800
BWD00006	The 'REAL' project – Relevant, Experienced, Applied Learning	200,250
BWD00007	Travel Support – to visit key industry, growers and government groups in Canterbury Plains region of New Zealand	14,680
CAA00004	Conference support – Grains West Expo 2005	7,500
CAN00001	Canprint – Warehouse and distribution of GRDC's publications, periodicals and promotional material	1,178

Project	Project Title	2004–05 Expenditure (\$)
CAS12	ACAS	868,400
CCM00001	Conference support – Soil Biology – Soil Health	7,500
CCS16	Ag Force & AWB Innovation in Grains Award 2005	10,000
CFI00003	Extension officer to link research and end-users for the northern grain region	175,061
CFM00004	Conference support – Fish, Aquaculture and Food Security: Sustaining Fish as a Food Supply	5,000
CHG00001	Conference support – Go Agro! Cotton and Grain Careers in the Central Highlands	4,000
COR00003	<i>Ground Cover</i> newspaper	333,557
COR00004	Travel support – to increase awareness of grains industry international collaboration	3,000
COR00005	Magazine supplements to GRDC's <i>Ground Cover</i> in October 2005, December 2005, February 2006 and April 2006	70,000
CSE00031	A workshop to identify priorities for the Phosphine Resistance Initiative	46,400
CSE00032	Conference support – 7th International Symposium on Aphids (including International Phylloxera Symposium, International Aphid Genomics Workshop)	6,000
CSL00002	Travel support – to attend the international symposium 'Adaptation of Plants to Water-Limited Mediterranean Environments'	2,500
CSP00054	Travel support – to attend the 4th International Crop Science Congress and 12th Australian Agronomy Conference	1,970
CSP00055	Travel support – to attend the 13th International Workshop on Plant Membrane Biology	2,930
CWF00006	Conference support – CWCFA Annual Seminar and Field Day 2005	7,500
DAN00047	Cropcheck for irrigated and dryland cropping	100,030
DAN00056	Conference support – Soil Biology in Agriculture	13,600
DAN00057	Travel support – to attend the International Sunflower Conference and Sunflower Study Tour	4,000
DAN00058	Travel support – to attend the 6th Australian Plant Virology Workshop	3,185
DAN00070	Conference support – Conservation Farming and No-tillage Adoption: Finishing the Job	10,000
DAN00071	Conference support – 49th Annual Conference and Workshop of the AARES	7,500
DAN00076	Travel support – to attend the 3rd International Durum Wheat Workshop	3,500
DAN00077	Travel support – to attend the American Association of Cereal Chemists (AACC) International Annual Meeting	2,120
DAQ00068	Networking innovation in grower groups	97,531
DAQ00080	Travel support – to attend the Gordon Research Conference on CO ₂ Assimilation in Plants: Genome to Biome, InterDrought II Conference and visits to FAO Headquarters, University of Oxford and Institute of Grassland and Environmental Research	3,000
DAQ00081	Travel support – to attend the Barley Technical Symposium	1,400
DAQ00082	Travel support – to attend the 7th International Wheat Conference	5,000
DAQ562	Travel support – to attend 6th International Conference on Precision Agriculture and other Precision Resources Management, USA, July 2002	6,175
DAS00038	State focus SA	99,003
DAS00049	Travel support – to attend the 9th International Barley Genetic Symposium	4,605
DAS00051	Travel support – to attend the 5th European Conference on Precision Agriculture	3,700
DAS00055	Conference support – Australian Research Assembly on Brassicas	6,000
DAS00056	Travel support – to visit North Dakota to inspect field and pot trials and broaden understanding of micronutrient technology	6,000
DAT00002	Enhancing TOPCROP delivery in Tasmania	66,200
DAV00044	Bestwool	87,000
DAV00045	Topcrop state focus	105,100

Project	Project Title	2004–05 Expenditure (\$)
DAV00053	Evaluation research: An innovative approach to assessing impact and building evaluation capability in farming systems groups	163,416
DAV00055	Travel support – to attend Eurosoil 2004	3,200
DAV00063	Conference support – Raised Beds From A to Z	2,500
DAV00064	Conference support – 4th National Conference on Environmental Management Systems (EMS) in Agriculture	5,000
DAV00065	Travel support – to attend Precision, UAN Rust and Resistance – a study tour of farming systems in WA	10,300
DAW00078	Continuing the Crop Updates Partnership	110,003
DAW00094	Conference support – Future Broadacre Agricultural Landscapes	10,000
DAW00095	Travel support – to attend the 7th International Oat Conference	4,500
DAW00096	Travel support – to attend the 14th Australian Weeds Conference	2,358
DAW00097	Travel support – to attend the 2004 Conference on Engineering Agriculture	1,443
DAW00115	Travel support – to attend the Australian Fodder Industry Association National Conference	1,500
DAW00116	Travel support – to attend the 7th International Wheat Conference	5,000
DER00005	Indepth interviews with leading graingrowers and industry opinion leaders	15,740
DER00006	Qualitative focus groups with graingrowers	29,950
DER00007	Quantitative telephone surveys with graingrowers	41,752
EAD00001	Travel support – to attend the 2005 series for GRDC Grain Research updates for advisers	10,000
GCA00008	Conference support – Grains Week 2005	45,000
GRD142	Online newsletter	4,940
GRD189	Grains Industry Research Scholarship – workshops	20,000
HFG00003	Travel support – to attend 4 Hart Fieldsite participants to attend WA Agribusiness Crop Updates	6,000
ICN00003	Northern Region Grains Research Updates	171,062
IDA00004	Industry Development Award – to tour National Oat Breeding Program	3,000
IDA21	Industry Development Award – Beyond the Farm Gate Young Grain Growers Tour	15,000
IPR00001	Vavilov-Frankel Fellowship	20,049
JLC00003	Research update seminars and advice sheet	79,900
JLC00008	Southern Region Grains Research Updates	208,950
KDI00014	The Workboot Series – Wheat, the story of wheat in Australia and resources kit	82,500
LIE00004	Industry Development Award – to attend the 12th Australian Agronomy Conference	10,000
LWR00002	Knowledge management in irrigated cotton and grains	100,000
MAC00002	Industry Development Award – premium grain study tour	10,000
MIG00006	Industry Development Award – to attend Cereal 2004 and DLG Feldtage 2004	15,000
MIG00008	The Grower Group Alliance – innovation through grower groups	172,708
MIG00009	Travel support – to conduct a training course in Practical Evolution of Projects for Grower Groups	7,500
NAC00004	Conference support – Agriculture Australia 2004	6,818
NAC00005	Conference support – Agriculture Australia 2005 – Australian Grains Conference	8,000
NFA00002	Southern NSW Research Advisory Committee facilitation support	19,100
NPA00002	Travel support – to attend the 5th European Conference on Precision Agriculture	8,700
NUF00007	Nuffield Farming Scholarships	135,000
NYS2	National Youth Science Forum 2004-2007	50,000
P&SD09	Customer Relationship Management Database	25,000

Project	Project Title	2004–05 Expenditure (\$)
PAL00005	Conference support – Bean Focus 2004	8,000
PAL00008	Conference support – Focus 2005 – Northern – Goondiwindi – chickpea in farming systems / Southern – Horsham – Return of desi chickpeas to the southern farming systems and their management	6,000
PDF46	Postdoctoral Fellowship – To study future policy prospects in agriculture: the EU and Australia	70,470
PHA00001	Travel support – to undertaking exotic pest incursion management study	1,000
PIG00003	Partners in Grain: a national professional development network for grain growers	190,000
PNS00001	Southern Region Communicator 03–06	199,326
PSD05	Ute Guides	140,000
PSD11	AFFA/ACID initiative involving rural women	4,239
PSD15	GGLN workshop	23,223
PSD17	Relationships with agribusiness	48,270
PSD18	Continuation of current and new surveys	30,895
PSD21	Communication campaigns and information packaging	129,729
PSD22	<i>Farming Ahead</i> articles	55,140
PSD31	Topactive	21,533
PSD32	Grower group awards	7,717
PSD36	Online technology dissemination	2,700
PSD37	Western Region industry consultation	23,568
RDC00003	Rewards from innovation forum and dinner	60,000
RDC14	Joint Farm Health and Safety Program	60,000
REP00002	Northern Region Communicator 03–06	74,320
RPI00005	Travel support – to attend the Riverine Plains Inc South Australia Farm Study Tour	14,000
RWC00001	Travel support – to attend the 13th Australasian Vertebrate Pest Conference	2,500
SAF00002	South Australian Research Advisory Committee facilitation support	17,800
SAN00005	Improving sustainable grain production through increased adoption of no-till farming	72,200
SAN00008	Industry Development Award – Canadian No-Till Study Tour 2004	15,000
SAN00009	Conference support – 7th Annual SANTFA Conference 2005	10,000
SAN00010	Travel support – to attend the 4th Annual Conference on Carbon Sequestration and study tour of Pacific north west/mid west USA carbon sequestration and carbon trading research and implementation	4,500
SAN00011	Travel support – to attend CTF05 National Controlled Traffic Conference ‘Farming with Precision’	2,500
SCD00001	Travel support – to attend the 2005 series for GRDC Grains Research update for advisers	10,000
SFS00005	Developing leadership skills in young growers	41,000
SPA00004	Conference support – 8th Symposium on Precision Agriculture Research and Implementation in Australasia	10,000
SPA00005	Conference support – 9th Symposium on Precision Agriculture Research & Implementation in Australasia	5,000
SYP00006	Industry Development Award – visit to WA Farming	7,100
TQA00003	Organisational and program performance indicators	161,455
TWY00001	Industry Development Award – to attend the 4th International Crop Science Congress	10,385
UA00069	Travel support – to attend Super Soil 2004	1,272
UA00082	Travel support – to attend the Plant and Animal Genome XIII Conference	3,000
UA00084	Travel support – to attend Systems Biology – From Genomes to Biomes	1,465
UCS00007	National Partners in Grains – was GCA23	25,771

Project	Project Title	2004–05 Expenditure (\$)
UDK00006	Conference support – Fifteenth Biennial Australasian Plant Pathology Society Meeting	10,000
ULA00005	Travel support – to attend Plant Genetics 2003	4,109
ULA00007	Travel support – to attend the XV International Plant Nutrition Colloquium	2,000
UM00019	Travel support – to attend the 4th International Crop Science Congress	1,850
UM00024	Travel support – to attend the Combined Australian Entomological Society, Society of Australian Systematic Biologists and Invertebrate Biodiversity and Conservation Conference. Use It or Lose It: Invertebrate Diversity in Landscape Management	1,020
UMO00003	Travel support – to attend Eurosoil 2004	3,200
UMU00015	Travel support – to attend the International Congress of Entomology and International Conference on Controlled Atmosphere and Fumigation in Stored Products	3,215
UMU00016	Travel support – to attend the 6th European Nitrogen Fixation Conference	2,222
UMU00017	Travel support – to attend the 6th European Nitrogen Fixation Conference	3,200
UMU00018	Travel support – to attend the 3rd Plant Genomics European Meetings	3,753
UMU00020	Travel support – to attend the 14th Australian Nitrogen Fixation Conference	1,650
UNE00007	Graduate Certificate in Sustainable Farm Production	183,022
UQ00033	Conference support – Third Australian Controlled Traffic Farming Conference (CTF05)	7,500
US00027	Travel support – to attend the 11th International Cereal Rusts and Powdery Mildews Conference	5,000
US00029	Travel support – to attend the 5th European Conference on Precision Agriculture	3,730
US00031	Travel support – to attend the 7th International Wheat Conference	5,000
US00032	Travel support – to attend Plant Biology 2005	3,500
USD00001	Travel support – to attend the WANTFA Pre Conference Seminar 2005, the WANTFA Conference 2004, the SANTFA Conference 2004 and the CWCFA Annual Seminar and Field Day	4,500
UT00007	Conference support – 12th Australian Barley Technical Conference	25,000
UT00008	Travel support – to attend the Rhizosphere Congress 2004	3,700
UT12	Building human capacity through schools into university and then primary industry	134,000
UT13	Rural social research underpinning policy and industry development	17,230
UWA00082	Improving the adoption of technology by neighbourhood grower groups	179,062
UWA00085	Travel support – to attend the 11th International Lupin Conference	3,900
UWA00086	Travel support – to attend 2005 WSSA Conference	3,500
UWA00087	Conference support – Second Australian Model Legume Workshop; Application to Crop and Pasture Improvement	5,000
UWA00088	Travel support – to attend the 8th International Workshop on Seeds	1,429
VF00002	Visiting Fellowship – Scott Douglas Hale	5,000
VFF00002	Victorian Research Advisory Committee facilitation support	17,800
VFF00003	Conference support – VFF Conference 2005	5,000
VIC00003	Conference support – GRDC Irrigation Update	3,500
VIC00004	Conference support – GRDC Irrigation Update	3,500
WAF00003	Conference support – WA Farmers Annual Conference 2005	5,000
WAN00008	WANTFA technology demonstration site	85,527
WAN00009	Conference support – 13th Annual WANTFA Conference 2005	10,000
WBS00002	Conference support – Capitalising on Quality Science: Seeding the Future	15,000
WDM00002	<i>Paddock Diary</i> 2003, 2004, 2005	42,145
WSN00001	Conference support – 14th Australian Weeds Conference	10,000
Total Product & Service Delivery		9,158,071

Project	Project Title	2004–05 Expenditure (\$)
ENHANCED MANAGEMENT		
GRD172	Global Crop Diversity Trust	1,333,333
GRD193	<i>Single Vision</i> regional forums	111,014
GRD195	Contribution to Single Vision implementation to match funding provided by Grains Council of Australian Inc. and United Grower Holdings	150,000
GRD198	Grains Business Forum	150,000
GRD4	GRDC project reviews 2004–05	4,634
Total Enhanced Management		1,748,982
TOTAL		106,355,422

Appendix 3

Joint R&D project list

R&D Partners	Project	Project title	Start date	Finish date
ACIAR, GRDC	ACA4	Pulse project with ICARDA	01-Jul-01	30-Jun-07
ACIAR, GRDC	ACA5	Oilseed Brassica Improvement in China, India and Australia	30-Jun-02	30-Jun-07
AWI, GRDC	AWR8	National Annual Pasture Legume Improvement Program	01-Jul-00	30-Jun-05
AWI, GRDC	CSA3	National Annual Pasture Legume Improvement Program – Queensland Component	01-Jul-00	30-Jun-05
AGO, GRDC	CSG00001	Life cycle assessment of greenhouse emissions from agriculture in relation to marketing and regional development	01-Dec-03	30-Jun-05
RIRDC, LWA, NLWRA, MDBC, DAFF, CSIRO, GRDC, the state governments of Victoria, Western Australia, New South Wales, Queensland, Tasmania, South Australia	CSO204	Evaluating impacts of deep drains on crop productivity and the environment	01-Jul-99	30-Mar-05
AWI, GRDC	DAN454	National Annual Pasture Legume Improvement Program – Phase II – Acid Soils (East) Zone	01-Jul-00	30-Nov-05
CRDC, GRDC	DAQ469	Using seasonal climate forecasts for more effective grain–cotton production systems	01-Jul-99	31-Mar-05
LWR, GRDC	DAS306	A million hectares for the future (SA component)	01-Jul-99	31-Dec-04
AWI, GRDC	DAS324	National Annual Pasture Legume Improvement Program – South Australian Component	01-Jul-00	30-Jun-05
LWR, GRDC	DAW660	A million hectares for the future (WA component)	01-Jul-99	31-Mar-05
AWI, GRDC	DAW723	Coordinator for the National Annual Pasture Legume Improvement Program (NAPLIP)	01-Jul-00	30-Jun-05
FRDC, GRDC	FRD00001	Aquaculture Nutrition Subprogram: Maintenance of strategic directions, project and infrastructure development, and facilitation of nutrition research and extension across all Australian aquaculture sectors	01-Jul-04	30-Jun-07

R&D Partners	Project	Project title	Start date	Finish date
HAL, GRDC	HRD1	Coordination of the National Cadmium Minimisation Strategy	01-Oct-99	30-Jun-05
HAL, GRDC	HRD2	Branched broomrape	01-Jul-01	30-Jun-05
LWR, GRDC	LWR00002	Knowledge management in irrigated cotton and grains	22-Mar-05	30-Jun-07
LWR, GRDC	LWR23	The GRDC's contribution towards <i>Grain and Graze Program</i>	01-Jul-03	30-Jun-08
RIRDC, GRDC	RDC00002	A responsive training market: the role of brokers	01-Sep-03	31-Aug-05
RIRDC, GRDC	RDC14	Joint Farm Health and Safety Program	01-Jul-02	30-Jun-07
RIRDC, LWA, NLWRA, MDBC, DAFF, CSIRO, GRDC, the state governments of Victoria, Western Australia, New South Wales, Queensland, Tasmania, South Australia	UWA337	Perennial pastures for cropping systems	01-Jul-99	31-Mar-05
AWI, GRDC	UWA360	National Annual Pasture Legume Improvement Project – Western Australia	01-Jul-00	30-Jun-06
RIRDC, MLA, APL, GRDC, SARDI, University of Sydney, University of New England, CSIRO, DPI Victoria, New South Wales Agriculture	VC17	Premium Grains for Livestock Program	01-Jul-03	30-Jun-06

Note

- ACIAR – Australian Centre for International Agricultural Research
- AGO – Australian Greenhouse Office
- APL – Australian Pork Limited
- AWI – Australian Wool Innovations
- CRDC – Cotton Research and Development Corporation
- DAFF – Department of Agriculture, Fisheries and Forestry
- DPI Victoria – Department of Primary Industries, Victoria
- FRDC – Fisheries Research and Development Corporation
- HAL – Horticulture Australia Limited
- LWA – Land & Water Australia
- MDBC – Murray–Darling Basin Commission
- MLA – Meat and Livestock Australia
- NLWRA – National Land and Water Resources Audit
- RIRDC – Rural Industries Research and Development Corporation
- SARDI – South Australian Research and Development Institute

Appendix 4

Portfolio monitoring and reviews

The GRDC continued to actively manage and monitor projects across the portfolio throughout 2004-05. Portfolio monitoring includes a range of activities to ensure that individual projects achieve their objectives and scheduled milestones, and that the R&D portfolio as a whole continues to address industry and government stakeholder priorities. The portfolio in 2004-05 included around one thousand projects, at various stages of development, spread across six output groups.

At the project level, portfolio monitoring includes an assessment of each project by way of an annual progress report identifying progress against the aims and milestones of the project. Progress reports must be submitted to the Corporation and meet minimum requirements before further payments are made to research partners.

The GRDC's portfolio monitoring activities were enhanced in 2004-05 by the introduction of new internal monitoring procedures to assess the performance and efficiency of administrative activities associated with managing the large

investment portfolio. The improved portfolio monitoring system now includes internal guidelines and/or procedures for:

- identifying and managing risks associated with individual projects during planning and implementation stages
- evaluating progress reports for project performance against objectives
- tracking the status of progress reports against internal performance targets and producing summary reports for management and staff. This contributed to a significant reduction in the number of progress reports remaining outstanding (unprocessed) at 30 June 2005
- developing business cases, terms of reference and timeframes for a limited number of formal reviews of targeted investment areas from across the entire portfolio.

The GRDC visited over 150 projects throughout 2004-05. This includes reviews and visits listed below:

Output Group	Project no.	Project title
Winter Cereals Improvement	CIM11	Enhanced evaluation of CIMMYT spring bread wheat germplasm in Australia – CIMMYT component
	DAQ00002	Novel approaches to In-head Frost Tolerance
	DAQ00045	SIP04 defect elimination in wheat
	DAQ483	Exploitation of the genetic resources of synthetic wheats – Queensland Department of Primary Industries component
	UA00034	SIP04 defect elimination in wheat
	UA00037	SIP04 defect elimination in wheat
	UA00039	SIP04 defect elimination in wheat
	UA00063	Breeding for frost tolerance in barley
	UQ123	A strategic framework to model CIMMYT wheat breeding programs with application to Australia – University of Queensland component
	UQ157	Enhanced evaluation of CIMMYT germplasm for Australia (continuation) – Australian component
	UQ158	Development of ICIS for Australian wheat breeding programs
	US00026	The cell biology of cold-induced male sterility in wheat
	USQ00002	Evaluation of transgenic wheats for frost tolerance
	UT8	Australia China collaboration on barley genetic resources

Output Group	Project no.	Project title
Crop Improvement	DAN00063	National Brassica improvement program – component 2, stage 3: NSW Agriculture
	DAQ00060	National mung bean improvement program
	DAQ00070	Australian peanut improvement program
	DAV00060	National Brassica improvement program - DPI Victoria and lead agency
	FLR00001	Canola yield decline: expanding the regional focus and disease emphasis using surveys, simulation studies and targeted soil/plant analysis
Crop Protection	ANU19	Development of specific microbial and transgenic technology to control fungal pathogens: a commercialisation project based on patent application no PP8394/99
	CRW5	CRC for weeds
	CSE00029	National invertebrate pest initiative
	CSE193	Grain protection genes
	CSV16	Biological control of mice – immunocontraception
	DAN485	Management of Fusarium diseases and common root rot of cereals in the northern cropping zone
	DAQ00074	Facilitating adoption of IPM in northern region broadacre farming systems
	DAW00106	Managing disease constraints in western region farming systems
	UM00016	Fungal pathology developments for management of diseases of oilseed Brassicas in Australia
	US315	Australian cereal rust control program
UWA399	Western Australian Herbicide Resistance Initiative (WAHRI)	
Sustainable Farming Systems	CHC24	An investigation into the hydrogeological transport of atrazine in soils of the Western Australian wheat-belt
	CWF00005	Combating subsoil constraints
	MFM1	Increasing cropping skills, yields and area in the South East of South Australia
	UCS00003	Sequencing crop rotations that best utilize lucerne biopores to control groundwater recharge and maintain dry catchments.
	UMU00003	National Rhizobium Program -developing and delivering high quality rhizobial inoculants to the Australian grains and pasture industries.
Value Chain	BRI00027	Objective grain quality testing
Product and Service delivery	CAS12	ACAS
	DAN00047	Cropcheck for Irrigated and Dryland Cropping
	DAV00044	Bestwool
	PNS00001	Southern Region Communicator 03–06
	UNE00007	Graduate Certificate in Sustainable Farm Production

Publications and products

The majority of the GRDC's 2004–05 reports and publications (in print, tape and electronic formats) are publicly available. There are some publications which are available only in electronic format and can be found on the GRDC's website GrainZone.

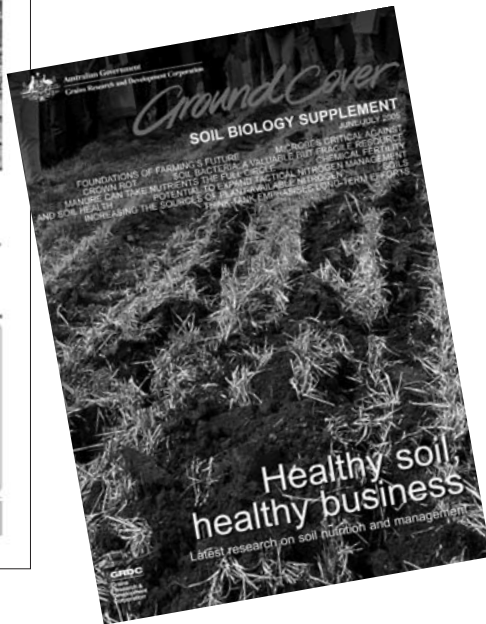
On average GrainZone's home page receives over 6,500 page views per month. The most popular section on the GRDC's website for technical information is the Grains Research Updates which are recording over 2,400 page views per month.

The GRDC has a large number of publications and products available, both 'for sale' and 'for free' many of them not listed here—details of which can be found on our website.

Listed here are publications and products, with the exception of corporate publications, which were released in 2004–05.

Free publications to the public while in stock

- *Australian Grain Focus 2004–2005*
- *GRDC Annual Report 2004–2005*
- *GRDC Annual Operational Plan 2005–2006*
- *Driving Innovation: The GRDC's Five Year Research & Development Plan 2002–2007*
- *Driving Innovation: The GRDC's corporate brochure*
- *Ground Cover* newspaper—the GRDC grains industry research newspaper—6 issues per annum
- *Paddock Diary 2005*
- *Raised Bed Farming*
- *2005 National Farm Groups' Manual (GRIST)*
- ABARE Reports:
 - *Russian Grains Industry (04.2)*
 - *Grains Industry—Outlook for 2004–2005 (04.3)*
 - *Grains Industry—Financial Performance to 2004–2005 (04.4)*
- Supplements:
 - *Value Chain*
 - *Soil Biology*



Newsletters:

- Update newsletters, issues 34 and 37 (information for technical advisers in the southern region)
- Update newsletters, issues 24, 25, 26 and 27 (information for technical advisers in the northern region)

High Rainfall Advice Sheets:

- Soil health for plant health
- Managing pastures in a crop rotation
- Diamondback moth in brassicas
- Adapting GPS and variable rate to irrigated crops
- No till management for high rainfall cropping
- Raised bed headland management
- Raised bed renovation
- Soil structure differences under raised beds
- Best practice for raised beds – controlled traffic cropping
- Do you need to obtain approval with raised bed works
- Lucerne

Back Pocket Guides:

- Slugs: *The Back Pocket Guide*
- Wheat Rust: *The Back Pocket Guide*

Sold to public

(Full or partial cost-recovery basis):

- Grain Yearbook 2005
- Adjuvants
- Wheat Products Guide
- The Wheat Book

TOPCROP Ute Guide booklet series:

- Field Crop Herbicide Injury: *The Ute Guide (national)*
- Pasture Legumes for Temperate Farming Systems: *The Ute Guide (southern & western regions)*
- Weeds: *The Ute Guide (Version 2—revised and updated southern region)*
- Crop Insects: *The Ute Guide (western region grain belt edition)*

CD-ROMs:

- ALFI (Australasian Livestock Feed Ingredient CD ROM Database) CD ROM

RESEARCH TO PROFIT GRAINGROWERS
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Growing closer to customers: The grains industry pursues new value
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GROWER GROUPS SUSTAIN THE CO-OP SPIRIT
An association has long been a part of Australia's grain landscape but as their numbers dwindle, growers have managed to reinvigorate the cooperative business model and have opened up the benefits to a wider membership.

GM CROPS CHANGING DIRECTION
The grain grower is seeing a lot of attention these days, but some of it is coming from the outside. From government, industry, and the public, the focus is on the safety of the food we eat. The grain grower is also seeing a lot of attention from the public, but it's not always the good kind. The grain grower is also seeing a lot of attention from the public, but it's not always the good kind.

IN THIS ISSUE

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- 3. DEALING WITH WEEDS
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GRAIN ZONE
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Growing closer to customers
How the grains industry is adding value and finding new markets

GroundCover
VALUE CHAIN SUPPLEMENT
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Growing closer to customers
How the grains industry is adding value and finding new markets

Appendix 6

Grains R&D Corporation Selection Committee

Senator the Hon Richard Colbeck
Parliamentary Secretary to the Minister for Agriculture, Fisheries and Forestry
Parliament House
CANBERRA ACT 2600

Dear Senator Colbeck

The following report summarises the activities of the Grains Research and Development Corporation (GRDC) Selection Committee for the reporting period to 30 June 2005.

Establishment of the GRDC Selection Committee

The terms of appointment of the six nominated members currently serving on the GRDC Board are due to end on 30 September 2005. The GRDC Selection Committee was established under the Primary Industries and Energy Research and Development Act 1989 (PIERD Act) for the purpose of nominating to the Parliamentary Secretary six persons for appointment as Directors of the GRDC Board.

On 19 April 2005 the Parliamentary Secretary reappointed Mr Dennis Mutton as the Presiding Member of the GRDC Selection Committee for a further three year term.

In accordance with section 124 of the PIERD Act, nominations were sought from the GRDC's representative industry organisation, the Grains Council of Australia, and the Parliamentary Secretary appointed the following people to the Selection Committee on 2 June 2005:

Mr Murray Jones;
Mr Douglas Clarke;
Mr Ian Hastings; and
Mr Greg Schulz.

The Selection Process

Advertisements seeking applications for the six Non Executive Director positions on the GRDC Board were placed in the following national and regional newspapers:

Financial Review, 27 May;
Weekend Australian, 28 May;
Qld Country Life, 26 May;
The Land, 26 May;
The Weekly Times, 25 May;
Stock Journal, 26 May;
Farm Weekly, 26 May; and
Tasmanian Country, 27 May.

The advertisement called for written applications against the core criteria contained in the PIERD Act including: grains production, processing and marketing; science, technology, and technology transfer; management and conservation of natural resources, including environmental and ecological matters; administration of research and development; economics; finance and business management; and sociology.

The closing date for applications was 14 June 2005 and 118 applications were received, including applications from four of the current Board members. Short-listing of candidates was undertaken on 27 June 2005 with 17 applicants scheduled for interview.

A full report on the outcome of the selection process, including the approved membership and the costs associated with the selection process, will be submitted in the following reporting period.

Yours sincerely

Dennis Mutton
Presiding Member
Grains Research and Development Corporation Selection Committee

5 August 2005



Mr Ken Tohara inspecting soba noodles being made at the Hakubaku noodle factory in Ballarat, Victoria. *Photo: Brad Collis*