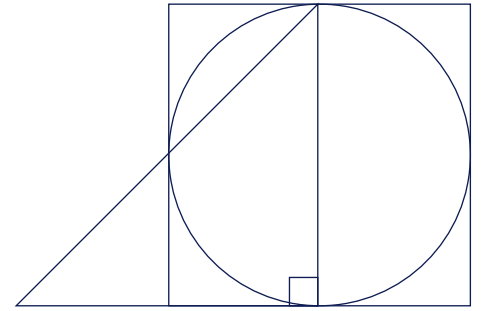


# Report

05/06



## Faculty of Natural and Agricultural Sciences



# Faculty of Natural and Agricultural Sciences

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# From the Dean's office



*Prof. Herman van Schalkwyk.*

The Faculty of Natural and Agricultural Sciences at the University of the Free State (UFS) leads the way in the practising of natural and agricultural sciences in South Africa and the highest levels of quality and credibility are reflected.

Our commitment, however, reaches far beyond just this. It reaches beyond the borders of the country and across continents; its multi-disciplinary and practical approach is vested in all the disciplines presented by the faculty.

In 2005/06 the Faculty experienced significant growth in measurable outputs. A contributing factor was the comprehensive apparatus strategy and plan which was implemented in 2005. With this strategy, university funds were used to leverage other funds in order to obtain huge discounts from suppliers of apparatus. In this way the faculty managed to obtain almost R50 million worth of apparatus in 2005.

The strategy was continued in 2006 when an agreement to the value of R7 542 531 was reached with Shimadzu, according to which apparatus was supplied to the faculty at discount prices. The agreement, which is valid for three years, entails the free replacement of apparatus which is purchased during this period with upgraded versions.

The new apparatus forms part of the UFS vision to compete internationally with quality research outputs in certain niche areas, to provide leadership in advanced training to students from the African continent and to establish the university as a leader among South African universities.

Two researchers with a B rating from the National Research Foundation (NRF) were also appointed. Both of these initiatives bore fruit and in 2006 the faculty increased its total research outputs by

about 13%. As an example, the Department of Chemistry's outputs increased by 100%.

The faculty has been bursting at the seams over the past couple of years. Student figures rose from 3 935 undergraduate, postgraduate and occasional students in 2005, to 4 224 in 2006. There is also strong representivity of students from other African countries and in 2005/06 almost 600 students studied at the faculty.

An extended B.Sc. programme has been presented to students since 2005. The programme aims at providing students who do not comply with all the requirements for the B.Sc. programme with the necessary sub-structure to complete the B.Sc. degree successfully. A preliminary evaluation of the results indicates that the programme is delivering the desired results.

The alignment of the Qwaqwa Campus, which was incorporated into the UFS in January 2003, remains a challenge. Regular discussions are held with staff on the campus in order to make the faculty's programmes more sustainable and to align it with the broader strategic plan of the UFS.

On a national level, the faculty is in the process of making its mark in terms of teaching and community service. In 2005 the faculty again actively began utilising its

experimental farms. A three-way agreement between the UFS, the National Farmers Union (NAFU) and the Mangaung Local Municipality led to the establishment of the Lengau Agricultural Development Centre on the Sydenham Experimental Farm. The centre provides training and mentorship to small-scale upcoming farmers.

To be dynamic and progressive requires innovative thinking. It requires commitment and a desire to deliver excellent teaching and learning opportunities to students. It requires a willingness to form partnerships, and a multi-disciplinary and practical approach to the tertiary education environment in South Africa.

This report covers the faculty's activities in 2005/06. It is a reflection of two years' commitment on the part of a team of skilled and motivated academics and support staff.



**Prof. Herman van Schalkwyk**

Dean: Faculty of Natural and Agricultural Sciences  
University of the Free State

# Agricultural Economics



“We have the ability to understand the social, environmental and economic challenges facing the agricultural sector in Africa and its people.”

Prof. André Jooste.

## Overview

The Department of Agricultural Economics had its origin in 1958 and has since developed into one of the leading departments of agricultural economics in South Africa, and possibly even in Africa.

This growth is a result of the department's capacity to capitalise on incentives, to build on partnerships with leading international counterpart departments, and to combine an entrepreneurial approach with the multi-disciplinary nature of tuition, research and community service in its efforts to address the challenges of a dynamic agricultural environment.

Teaching and mentorship are regarded as pivotal in reaching our objectives. Over and above the fact that course materials are regularly updated to reflect international best practice, engagement with students is taken very seriously. The seminar series in the department provides students and staff with the opportunity to engage actively in research and teaching matters. As a result, 13 of a total of 30 papers were presented by students and staff of the department at the annual Agricultural Economics Association of South Africa (AEASA) conference in 2005, while at the 2006 AEASA conference, 15 of the 35 papers presented were from the department, and one was an invited paper.

In 2005 Mr Pieter Taljaard, Dr Zerihun Alemu and Prof. Herman van Schalkwyk, Dean: Faculty of Natural and Agricultural Sciences, won the prize for the best published article in Agrekon at the AEASA conference. Messrs Andries Jordaan and Diekus van Wyk respectively won the second prize for the best M.Sc. thesis and for the best student essay. Mr Henry Jordaan received the award for the best final year student in Agricultural Economics at the UFS.

The 2006 AEASA conference was held in Grahamstown. Mr Olu Oyewumi won the prize for the best master's thesis. Mr David Spies, Ms Heidi Mabandda and Mr Van Wyk respectively won the second prize for the best paper, best poster and the best student essay. Mr Ferdie Botha received the award for the best Agricultural Economics student at the UFS.

“The department was also privileged to be able to host two AW Mellon Foundation fellows.”

During a conference of the International Food and Agribusiness Management Association (IAMA) that was held in Buenos Aires, Argentina, the South African team, consisting of students from the Universities of the Free State, Stellenbosch, and Pretoria, won a competition in which they had to develop a business strategy for an Italian company threatened by the dreaded bird flu epidemic. Six student teams from various countries took part in the competition. Two heats were held and the South African team walked away with the laurels.

In 2005 three National Research Foundation (NRF) projects were registered in the department, and two researchers received Thuthuka grants from the National Research Foundation (NRF). In 2006 the department was successful in establishing a Research Niche Area (RNA) entitled: Risk Management in Africa, under the auspices of the NRF.

The department was also privileged to be able to host two AW Mellon Foundation fellows, Ms Ntsikane Maine (Ph.D.) and Mr Derrick Montshwe (M.Sc.), under the university's Grow Our Own Timber programme. Both fellows have completed their studies and in 2005 Ms Maine was appointed as lecturer in the department. Mr Montshwe is now employed as Assistant Project Manager: Farmer Support and Development Programmes at the National Emergent Red Meat Producers' Organisation (NERPO). New candidates for the Grow Our Own Timber programme will be nominated for 2007.

In 2005/06, 49 M.Sc. and 41 Ph.D. students enrolled for their studies in the department. This includes students from Eritrea, Mozambique, Nigeria, Namibia, Botswana, Lesotho, Ethiopia, Swaziland, Ghana and South Africa, among others. The department also has a very active student body known as LekForum.

The department continues to excel in community service. Apart from the fact that many of the research projects have a strong community service component, several



The department and donors donated a manual and DVD entitled: *Growing vegetables, a comprehensive guide on how to establish, maintain and manage a vegetable garden* to two projects in Bloemfontein. Mss Marieta Jonker of Free State Care in Action and Mathilda Koch of Child Care Bloemfontein and Childline Free State received the manuals on behalf of their organisations. Handing over the manuals are, from the left: Mss Dora du Plessis, co-ordinator of the vegetable garden project, Koch, Dr Wimpie Nell, Director of the Centre for Agricultural Economics at the UFS, and Ms Jonker.



At an international workshop for trainers in the United States of America's National Council on Economic Education's (NCEE) outreach programme to improve the quality of training of Economics teachers and lecturers across the world, are, from the left, front: Dr Patty Elder, Vice-President of the NCEE's international programme, and Mr Wimpie Plaatjies, Provincial Subject Co-ordinator for Economics of the Northern Cape Province; back: Prof. Geoff Antrobus, Department of Economics at Rhodes University, Prof. Klopper Oosthuizen, Lecturer at the department and initiator of the cooperative agreement with the NCEE, and Prof. André Jooste, Departmental Chairperson.

actions focus specifically on community service. These include a short course series on topics such as financial management, strategic management and farm management. Fiftytwo commercial farmers and 95 emerging commercial farmers attended these courses in 2005 and in 2006, 65 commercial farmers attended the courses. No new courses for emerging farmers were presented in 2006, but follow-up visits were made to

the emerging farmers at Koffiefontein and Oppermansgronde. The Centre for Agricultural Management also involved a group of farmers at Tierpoort outside Bloemfontein.

The Food Garden Training Course was presented at schools, the Mangaung University of the Free State Community Partnership Programme (MUCPP) and at Springfontein and Trompsburg, where com-



munity members attended the courses. Members of the reach project attended the Food Garden Training Course in Heidedal, Bloemfontein.

In March 2006 a Meat Imbizo was held at the UFS, hosted by Prof. André Jooste, Departmental Chairperson. Representatives from the National Agricultural Marketing Council (NAMC), the National Department of Agriculture (NDA), Griekwaland-Wes Koöperasie (GWK), SenWes, Afgri, Free State Agriculture and Vleissentraal spoke at this event. The objective of the imbizo was to create an opportunity to exchange information and to identify possible points for collaboration between the different industries. In addition, Prof. Johan Willemse and his researchers conducted successful Market Outlook Workshops with groups of farmers, which were well attended.

A short course in grain options, attended by 83 persons, was presented in collaboration with Ms Sue Goll, a recognised international specialist in grain options.

An initiative of the department in partnership with the Provincial Department of Education and the National Council for Economic Education (NCEE) in the United States of America (USA) is growing rapidly and is considered to be one of the flagship community service projects in the faculty. The main thrust of this initiative is to build capacity in teaching economics at school level. Other collaborators include the School for Education and the Department of Economics at the UFS. The Economic Education initiative is managed by Prof. Klopper Oosthuizen. This project has already had tremendous successes, which include Train-the-teacher workshops attended by 73 teachers and a Train-the-trainer workshop attended by 50 delegates from countries with transitional economies such as Egypt, Mexico, Indonesia, Jordan and Palestine. Future plans include a roll-out to other provinces and the rest of Africa.

More than a thousand teachers in the intermediate and senior phases in Free State schools already benefit from the NCEE partnership. A very important role player is Mr Mafu Rakometsi, the Superintendent General of the Free State Department of Education who acts as ambassador in expanding the partnerships in South Africa beyond the borders of the Free State.

The establishment of the Central South African Council on Economic Education (CSACEE) has been another highlight in this department. Ms Winkie Direko, National Member of Parliament and former Premier of the Free State, is playing a leading role in positioning the CSACEE.

The department also has links with renowned international partners through co-operation agreements. The Departments of Applied Economics at the University of Minnesota, USA and Agricultural Economics at the Purdue University in Indiana, USA strengthen the capa-



The department continues to excel in community service, as many of the research projects have a strong community service component and several specific actions focus on community service.

city of the department and provide a vehicle for continuous international benchmarking.

The group that specialises in agricultural risk management and the development of decision support models with particular reference to irrigation is renowned for the development of management strategies and technologies with the potential of increasing economic returns and reducing risk in agricultural production. The group is also represented in two international working groups on irrigation economics and consists of Prof. Oosthuizen, Mr Bennie Grové and several student researchers.

Another research group, consisting of Prof. Giel Viljoen, Dr Godfrey Kundhlande and several student researchers, focuses on the generation of information to improve efficiency and sustainability in the use and management of natural resources (water and land). The group more specifically focuses on the determination and control of the social and economic impacts of floods and water restrictions. More recently, the research agenda of this group was broadened to include the economic impacts and management of saline irrigation water, capacity sharing in water use and rain water harvesting.

The Centre for Agricultural Management follows a multi-disciplinary and practical approach to equip students with skills to achieve sustainable success in the total agricultural system. Apart from strategic management research, the centre also specialises in precision agriculture research at master's and doctoral level. This research is funded by New Holland SA. With the financial assistance of its donors Afgri, Agri Risk Specialists (ARS), First National Bank and Vrystaat Koöperasie Beperk (VKB), the centre also developed a certificate training package consisting of various short courses in agriculture and has recently launched its Vegetable Garden training video – a first in South Africa. The group consists of Dr Wimpie Nell, Ms Maine and several student researchers.

In 2005 Proff. Jooste, Willemse, Kobus Laubscher, Dr Alemu and Mr Taljaard focused on topics such as trade, policy analysis, value chain analysis, marketing, development and strategic planning in a multi-disciplinary and holistic manner. Prof. Jan Groenewald and Dr Kit le Clus, both Extraordinary Professors in this department, work closely together with this group. In addition, the capacity of the department and this group was extended to the Western Cape by Affiliate Associate Professor, Prof. Daan Louw, who is based in Paarl and who is the Chief Executive Officer of Optimal Agricultural Business Solutions (OABS). Their work also goes beyond the borders of South Africa into neighbouring



A large group of the students and researchers in the department received their degrees in 2006.



The department presented a Meat Imbizo to discuss the challenges facing the industry and identify possible areas of collaboration. Attending the Imbizo are, from the left, Messrs Dave Ford, South African Feedlot Association, Aggrey Mahanjana, National Emergent Red Meat Producer Organisation, Mogala Mamabolo, Department of Agriculture in Pretoria, Prof. André Jooste, Departmental Chairperson and Mr Harry Prinsloo, National Wool Growers Association.

countries and they are renowned for their ability to link external challenges with the internal dynamics of industries and firms. The group actively addresses policy, value chain and management issues in a multi-disciplinary and holistic manner.

Agricultural Engineering, led by Mr Kobus van Staden, focuses on the whole spectrum of irrigation design ranging from flood irrigation to specialised drip irrigation. Central to this group's activities is an emphasis on irrigation that is suitable for Africa and its specific

climatic conditions. On the research front, the group is a leader in sub-surface drip irrigation and places much-needed emphasis on sustainable agricultural projects in rural areas.

Research areas covered in the department included value chain analysis, resource and environmental economics, risk management, trade, policy analysis, development and farm management. Research concentrated on finding solutions to challenges not only in South Africa, but also in Africa as a whole.

The research expertise in the department is further recognised by organisations such as the World Bank, United States Agency for International Development (USAID), Food and Agricultural Organisation (FAO) and the Organisation for Economic Co-operation and Development (OECD) and numerous others within South Africa, leading to demand-driven research initiatives.

Prof. Jooste resigned from the university at the end of 2006. Prof. Johan Willemse was appointed as chairperson in his place.



The South African team that won a competition during a conference of the International Food and Agribusiness Management Association in Buenos Aires, Argentina were, from the left: Prof. André Jooste, Departmental Chairperson, Kobus Laubscher, team advisor and Lecturer at the department, Mr Bonani Nyhodo, student at the University of Stellenbosch, Dr Dirk Esterhuizen, Manager: Agricultural Information of the Agricultural Chamber of Business and student at the University of Pretoria, Prof. Herman van Schalkwyk, Dean: Faculty of Natural and Agricultural Sciences at the UFS, Mr Olubokola Oyewumi, student at the UFS, Mr Hilton Madevu, student at the University of Pretoria, and Ms Lindie Botha, also a student from the UFS.

#### Academic staff

**Professors:** Prof. Kloppe Oosthuizen, Giel Viljoen

**Associate Professors:** Prof. André Jooste, Johan Willemse

**Professors Extraordinary:** Prof. Jan Groenewald, Kit le Clus

**Affiliate Associate Professor:** Prof. Daan Louw

**Senior Lecturers:** Drs Wimpie Nell, Zerihum Alemu, Mr Kobus van Staden

**Lecturers:** Messrs Bennie Grové, Pieter Taljaard, Ms Ntsikane Maine

**Contract Lecturers:** Prof. Kobus Laubscher, Dr Godfrey Kundhlande

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# Research outputs

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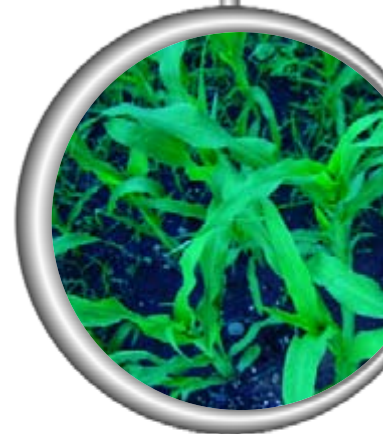
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# Statistical data of the faculty



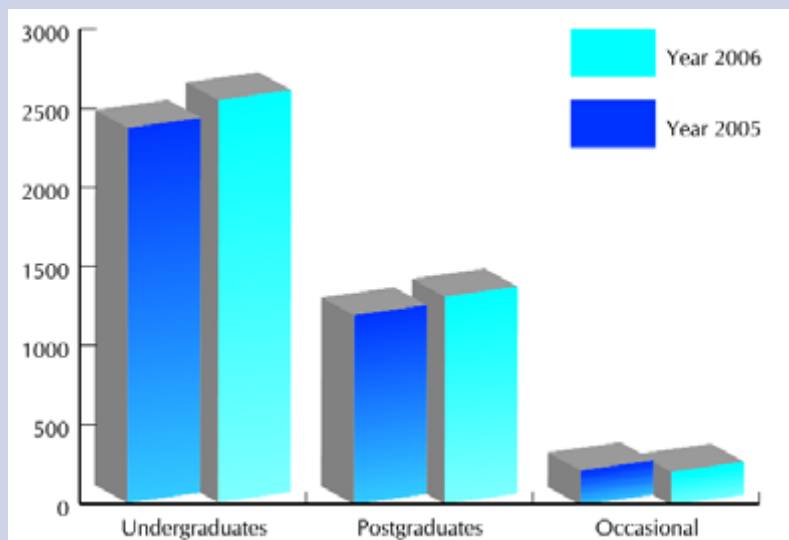
# Student figures

Faculty of Natural and Agricultural Sciences, 2005/06

Male					
2005					
Description	African	Coloured	Indian	White	Total
Undergraduate	676	31	26	724	1457
Postgraduate	351	22	15	400	788
Occasional	84	3	4	17	108
<b>Total 2005</b>	<b>1111</b>	<b>56</b>	<b>45</b>	<b>1141</b>	<b>2353</b>
2006					
Description	African	Coloured	Indian	White	Total
Undergraduate	729	28	21	768	1546
Postgraduate	385	21	16	431	853
Occasional	68	2	2	23	95
<b>Total 2006</b>	<b>1182</b>	<b>51</b>	<b>39</b>	<b>1222</b>	<b>2494</b>

Female					
2005					
Description	African	Coloured	Indian	White	Total
Undergraduate	563	41	11	394	1009
Postgraduate	206	16	11	221	454
Occasional	101	5	2	11	119
<b>Total 2005</b>	<b>870</b>	<b>62</b>	<b>24</b>	<b>626</b>	<b>1582</b>
2006					
Description	African	Coloured	Indian	White	Total
Undergraduate	641	39	17	401	1098
Postgraduate	243	15	17	234	509
Occasional	103	2	2	16	123
<b>Total 2006</b>	<b>987</b>	<b>56</b>	<b>36</b>	<b>651</b>	<b>1730</b>

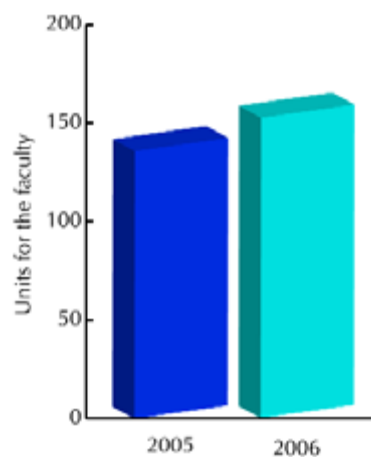
Total					
2005					
Description	African	Coloured	Indian	White	Total
Undergraduate	1239	72	37	1118	2466
Postgraduate	557	38	26	621	1242
Occasional	185	8	6	28	227
<b>Total 2005</b>	<b>1981</b>	<b>118</b>	<b>69</b>	<b>1767</b>	<b>3935</b>
2006					
Description	African	Coloured	Indian	White	Total
Undergraduate	1370	67	38	1169	2644
Postgraduate	628	36	33	665	1362
Occasional	171	4	4	39	218
<b>Total 2006</b>	<b>2169</b>	<b>107</b>	<b>75</b>	<b>1873</b>	<b>4224</b>



Student figures

Student nationality		
Nationality	2005	2006
Angola	1	
Asian countries	21	18
Botswana	20	20
European countries	6	6
Lesotho	142	142
Malawi	2	1
Mauritius		2
Mozambique	8	7
Namibia	40	42
No information	1	
North America	4	4
Other Africa	45	48
South Africa	3610	3893
South America		1
Swaziland	13	13
Zambia	4	6
Zimbabwe	18	21
<b>Total</b>	<b>3935</b>	<b>4224</b>

## Research outputs for the Faculty of Natural and Agricultural Sciences

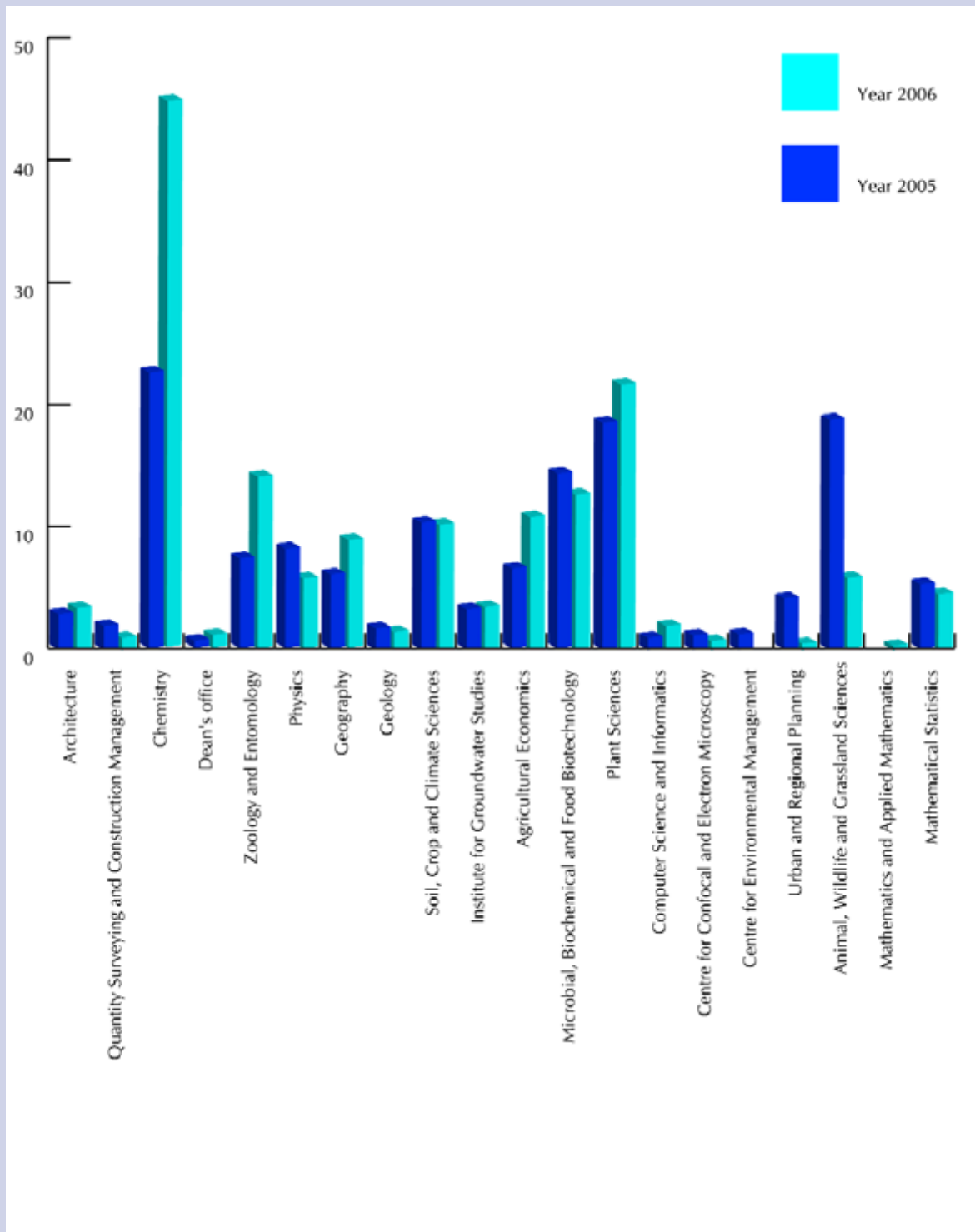


Articles published in accredited approved research journals.



## Departmental research outputs

Articles published in accredited approved research journals, 2005/06



# Glossary



# Glossary

## A

ACIAR	Australian Centre for International Agricultural Research
AEASA	Agricultural Economics Association of South Africa
ALPRU	African Large Predator Research Unit
ARC	Agricultural Research Council
ARMSCOR	Armaments Corporation of South Africa
ARS	Agri Risk Specialists
ASAQS	Association of South African Quantity Surveyors
ASSA	Anatomical Society of South Africa
ASTER	Advanced Spaceborne Thermal Emission and Reflection Radiometer
AVS	American Vacuum Society

## C

CANSA	Cancer Association of South Africa
CATSA	Catalysis Society of South Africa
CBD	Convention of Biological Diversity
CCEM	Centre for Confocal and Electron Microscopy
CePHMa	Centre for Plant Health Management
CfPB	Centre for People and Buildings
CIAT	International Centre for Tropical Agriculture
CIDB	Construction Industry Development Board
CIMMYT	International Maize and Wheat Improvement Centre
CIOB	Chartered Institute of Building
CIOB-SA	Chartered Institute of Building - South Africa
CSACEE	Central South African Council on Economic Education
CSIC-INTA	Centro de Astrobiología
CSIR	Council for Scientific and Industrial Research
CSIRO	Commonwealth Scientific and Industrial Research Organisation

## D

DEAT	Department of Environmental Affairs and Tourism
DiMTEC	Disaster Management Training and Education Centre for Africa
DMISA	Disaster Management Institute of South Africa
DST	Department of Science and Technology

## E

EAAP	European Association for Animal Production
EASA	Education Association of South Africa
ECA	European Crystallographic Association
EIGG	Environmental Inorganic Geochemistry Group
EPWP	Expanded Public Works Programme
ESBES	European Symposium on Biochemical Engineering Science
ESREL	European Safety and Reliability
ESRP	Economic and Social Rehabilitation Programme

## F

FAO	Food and Agriculture Organisation
FEMS	Federation of European Microbiological Societies
FMP	Facilities Management Programme
FOTIM	Foundation of Tertiary Institutions of the Northern Metropolis

## FSRPO

Free State Red Meat Producers Organisation

## G

GIS	Geographical Information Systems
Glen ADI	Glen Agricultural Development Institute
GM	Genetically Modified
GMBA	Gauteng Master Builders' Association
GMO	Genetically Modified Organisms
GWK	Griekwaland-Wes Koöperasie

## H

HIV	Human Immunodeficiency Virus
HPCSA	Health Professions Council of South Africa
HPLC	High Performance Liquid Chromatography
HSPCM	Health and Safety Programme for Construction Managers

## I

IAGOD	International Association on the Genesis of Ore Deposits
IAH	International Association of Hydrogeologists
ICCC	International Conference on Coordination Chemistry
ICEC	International Cost Engineering Council
ICID	International Commission on Irrigation and Drainage
ICP	Inductively Coupled Plasma
ICRBM	International Conference on Rodent Biology and Management
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IDC	Industrial Development Corporation
IGS	Institute for Groundwater Studies
IITA	International Institute of Tropical Agriculture
INCRoP	Insects on New Crops Programme
INTSORMIL	International Sorghum and Millet Research Support Programme

## IPMA

International Project Management Association

## IPMP

Intensive Project Management Programme

## IRDP

Institutional Research and Development Programme

## IRWH

In-field Rainwater Harvesting

## IUCr

International Union of Crystallography

## IUMS

International Union of Microbial Societies

## IUPAP

International Union of Pure and Applied Physics

## J

JFM	Journal of Facilities Management
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## L

LExEn	Life in Extreme Environments
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## M

MIRCHEN	Microbiological Resources Centre
MIT	Massachusetts Institute of Technology
MRM	Mineral Resource Management
MSA	Master's Degree in Sustainable Agriculture
MSSA	Microscopy Society of Southern Africa
MUCPP	Mangaung University Community Partnership Programme
MURP	Master's Degree in Urban and Regional Planning

## N

NaCOF	National Climate Outlook Forum
NAFU	National African Farmers Union
NAMC	National Agricultural Marketing Council
NASA	National Aeronautics and Space Administration
NASSP	National Astrophysics and Space Science Programme
NCEE	National Council for Economic Education
NDA	National Department of Agriculture
NECSA	National Energy Commission of South Africa
NELSAM	Natural Earthquake Laboratory in South African Mines
NERPO	National Emergent Red Meat Producers' Organisation
NGO	Non-Governmental Organisation
NML	National Metrological Laboratory
NMMU	Nelson Mandela Metropolitan University
NMR	Nuclear Magnetic Resonance
NRF	National Research Foundation
NUFU	Norwegian Council of Universities Committee for Development, Research and Education
NWGA	National Wool Growers' Association

## O

OABS	Optimal Agricultural Business Solutions
OECD	Organisation for Economic Co-operation and Development

## P

PARSA	Parasitological Association of Southern Africa
PDMIW	Processing and Disposal of Mineral Industry Wastes
POT	Peaks over Threshold
PPP	Public Private Partnership
PRT	Protein Research Trust

## R

RICS	Royal Institute of Chartered Surveyors
RIEP	Research Institute of Education Planning
RNA	Research Niche Area
RPO	Red Meat Producers' Organisation

## S

SA	South Africa
SAACE	South African Association of Consulting Engineers
SAB	The South African Breweries Limited
SACI	South African Chemical Institute
SACPCMP	South African Council for the Project and Construction Management Profession
SACPVP	South African Council for the Property Valuation Profession
SACQSP	South African Council for the Quantity Surveying Profession
SADC	Southern African Development Community
SAFMA	South African Facilities Management Association
SAFOI	South African Fryer Oil Initiative
SAIP	South African Institute of Physics
SAISC	Southern African Institute of Steel Construction
SAMSI	Statistical and Applied Mathematical Sciences Institute

SANCIAHS	South African National Committee for the International Association of Hydrological Sciences	SEDA	Small Enterprise Development Agency	UNEP	United Nations Environment Programme
SANCU	South African National Consumer Union	SMME	Small, Medium and Micro Enterprises	UNESCO	United Nations Educational, Scientific and Cultural Organisation
SANPAD	South Africa-Netherlands Research Programme on Alternatives in Development	SRC	Student Representative Council	USA	United States of America
SAPOA	South African Property Owners' Association	SRL	Sustainable Rural Livelihood	USAID	United States Agency for International Development
SAPS	South African Police Services	SSAG	Society of South African Geographers	UTCHEM	University of Texas Chemical Compositional Simulator
SAQA	South African Qualifications Authority	<b>T</b>		UWC	University of the Western Cape
SASAS	South African Society for Animal Science	THRIP	South African National Research Foundation Thrust for Industry-Related Projects	<b>W</b>	
SASQUA	Southern African Society for Quaternary Research	TUE	Technical University Eindhoven	WARFSA	Water Research Fund of Southern Africa
SAVAH	South African Association of Visual Arts Historians	<b>U</b>		WATOC	World Association of Theoretically Orientated Chemists
SBE	Sustainable Built Environments	UCT	University of Cape Town	WFP	World Food Programme
		UFS	University of the Free State	WITS	University of the Witwatersrand
		UJ	University of Johannesburg	WRC	Water Research Commission
		UK	United Kingdom	WUA	Water Users' Association
		UN	United Nations		