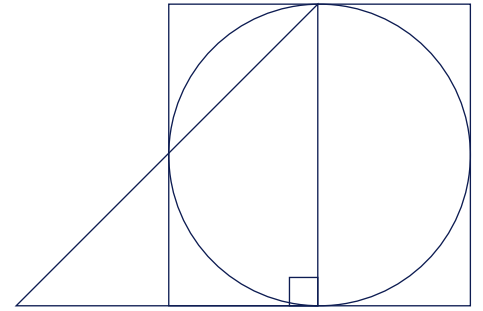


Report

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.

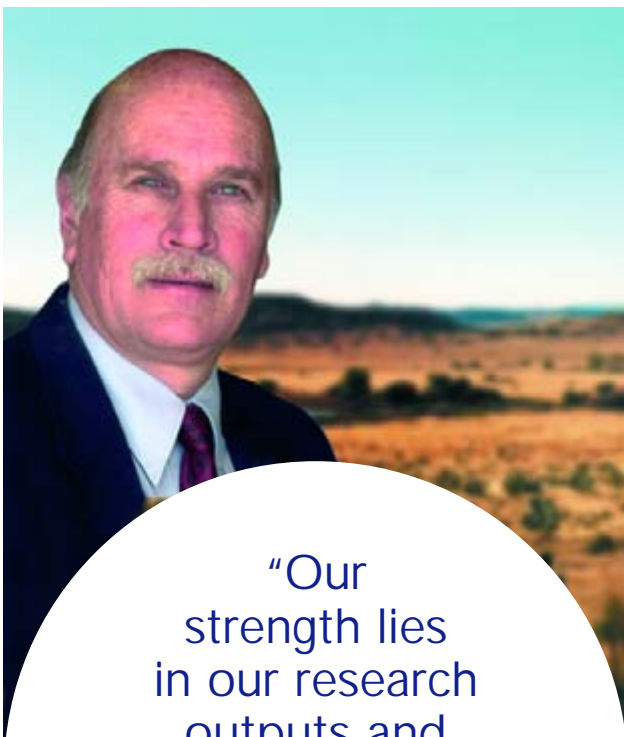
This report covers the faculty's activities in 2005/06. It is a reflection of two years' commitment on the part of a team of skilled and motivated academics and support staff.



Prof. Herman van Schalkwyk

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

Animal, Wildlife and Grassland Sciences



“Our
strength lies
in our research
outputs and
community
involvement.”

Prof. Johan Greyling.

Overview

The Department of Animal, Wildlife and Grassland Sciences researches animal production to supply animal products of high quality, taking into account public health and the protection of natural resources and wildlife, by applying the principles of the disciplines of Animal Physiology, Animal Nutrition, Animal Breeding and Pasture Science.

Animal Science as such focuses on a variety of livestock species, among others cattle, sheep, goats, pigs and poultry, in production systems ranging from intensive to extensive and from small scale to large commercial units.

The faculty signed an agreement regarding a Nguni cattle project with the Industrial Development Corporation (IDC) and the Northern Cape Department of Agriculture and Land Reform in Kimberley. With this flagship project commercial farmers will be technically assisted to change community farmers into accredited breeders of stud quality Nguni cattle. The UFS will be involved with the implementation and monitoring of the project, as well as research, training of livestock managers and the marketing of the project.

Grassland Science, on the other hand, involves the study of all aspects regarding the utilisation, conservation and improvement of grassland and cultivated pastures - in harmony with animal production. This discipline is also committed to the conservation of the environment, and here wildlife contributes to the efficient utilisation of the grazing ecosystem.

The ultimate aim of training and research in the department is to increase food and fibre production whilst maintaining quality and natural resources. The fact that the livestock industry in South Africa is responsible for 45% of total agricultural production, reflects the importance of these disciplines in the department and in the industry.

External funding from national and international institutions such as the National Research Foundation (NRF), the AW Mellon Foundation, Cape Mohair and Wool, the National Wool Growers

“The ultimate aim of training and research in the department is to increase food and fibre production whilst maintaining quality and natural resources.”

Association (NWGA), the May and Stanley Smith Charitable Trust, Alexander Forbes, the Central Research Fund of the UFS and the National Lucerne Organisation, has been the life-line in making research possible and in spreading the reputation of the department both locally and abroad.

The research facilities were upgraded in 2005 with the acquisition of apparatus to the value of more than R600 000 for the year – a great injection via the dean’s office, which helped considerably in capacity building.

Community service projects in terms of small-scale egg production in 35 households in the rural areas, together with broiler production systems in four schools for the handicapped, were maintained. The team re-

sponsible for these projects was Prof. Johan Greyling Departmental Chairperson, Ms Khoboso Lehloenya, Dr Luis Schwalbach and Mr Foch de Witt. Training of upcoming small-scale livestock farmers in basic husbandry skills was also undertaken in Bothaville by Prof. H.O. de Waal and Dr Schwalbach - evidence of the wide scope of community service in the department.

Proff. Greyling, Frikkie Nesor, Hentie van der Merwe and De Waal were involved as the main judges in the National Breed Plan’s Voermol Cattle and Sheep Farmer of the year, SA Dairy Farmer of the year and SA Young Farmer of the year competitions, as well as in farmers’ days. All members of the department also made themselves available



Hens in a small-scale layer unit.



Involved in a small-scale egg production project supported by the UFS are, from left: Mss Aletta Bob, Khoboso Lehloeny, co-ordinator of the project from the department and Merriam Aplane.



The South African Society for Animal Science (SASAS) presented its 41st congress at the UFS. The theme was: *New challenges for the animal science industries*. At the congress are, from the left, back: Prof. H.O. de Waal, Chairperson of the Organising Committee: SASAS Congress 2006, Mr Paul Bevan, President of SASAS, front: Mr Aggrey Mahanjana, Group Managing Director of the National Emergent Red Meat Producers' Organisation and Dr Wameotsile Mahabile, Department of Agricultural Research at Sebele, Gaborone, Botswana.



Attending the signing ceremony between the UFS, the Industrial Development Corporation (IDC) and the Northern Cape Department of Agriculture and Land Reform are, from the left: Dr Michael Hendricks, Director-General: Northern Cape, Prof. Herman van Schalkwyk, Dean: Faculty of Natural and Agricultural Sciences at the UFS, Mr Mvuleni Qhena, Chief Executive Officer of the IDC, Ms Tina Joemat-Pettersson, Minister of Agriculture and Land Reform in the Northern Cape, and Mr Kagisho Molusi, Minister of Sport, Arts and Culture in the Northern Cape.

for consultation with farmers and institutions. They served on various formal agricultural committees, among others the Redmeat Producers Organisation (RPO), the Free State Game Steering Committee, the National Lucerne Organisation, the SA Society for Animal Science, the Grassland Society of Southern Africa, and the World Poultry Organisation, as well as on the editorial boards of national and international journals such as *Small Ruminant Research*, *Livestock Production Science*, *SA Journal of Animal Science* and the *SA Journal of Grassland Science*.

Besides teaching, one of the major strengths of the department has been in research outputs. In 2005 Proff. Japie van Wyk and Nesper made research presentations at the European Association for Animal Production in Sweden and attended the Interbull meeting in Uppsala, Sweden.

Nationally, Grassland Science workshops and symposia were attended and presentations were made by Prof. Hennie Snyman, Prof. Nico Smit and Mr Gideon Janse van Rensburg. The 10th International Grassland Congress held in Dublin, Ireland was attended by Proff. Smith and Snyman. These two professors, besides making their own presentations, were authors/co-authors of 11 of the presentations.

During the 40th Annual Congress of the Grassland Society of Southern Africa, the poster presented by Mr Janse van Rensburg and Prof. Snyman was judged the best. Short courses on artificial insemination in sheep and cattle were presented by Dr Schwalbach, Prof. Greyling and Ms Lehloeny to students and farmers. The department also organised and chaired a Cattleman's Conference (120 participants) in conjunction with the Glen Agricultural Development Institute (Glen ADI) and locally renowned experts. Prof. Van der Merwe also presented a Meadows farmers' day on the Paradys experimental farm, with the focus on the rearing of calves.

Proff. Van Wyk, Nesper and Mike Fair from the discipline of animal breeding presented an accredited course on the basic principles of animal breeding to technical advisors, and two meetings of the Postgraduate School in Animal Breeding were also held at the department. Several members of the department were invited to make presentations at farmers' days and information days during 2005 and 2006.

Contract research was done under supervision of Prof. Van der Merwe with Meadow Feeds and the National Lucerne Organisation, while Dr Schwalbach was contracted by Virbac. Negotiations with Intervet are under way regarding joint ventures.

The African Large Predator Research Unit (ALPRU), situated in the department and under the supervision of Prof. De Waal, published and undertook research projects funded by outside institutions. Great success was achieved in co-ordinating and documenting all relevant research done on wild carnivores. A new course on Applied Nutrition in Wild Herbivores and Carnivores was established in 2005 – an aspect that is generating great interest amongst students and the industry.

In 2006 the department made significant contributions, both locally and abroad, in terms of its research. Proff. Van Wyk and Nesper, together with Mr Fair, attended and made



“In 2006 the department made significant contributions, both locally and abroad, in terms of its research.”

presentations at an Animal Breeding World Congress, applied to livestock production in Brazil. Prof. Snyman, too, collaborated on research related to Grassland Science at an institute in Leipzig, Germany.

The three physiologists in the department, Prof. Greyling, Dr Schwalbach and Ms Lehloeny, attended a Ruminant Reproduction Symposium in Wellington, New Zealand where all presented papers. Ms Lehloeny also presented a research paper at the European Animal Production congress in Slovenia. Regarding local congresses, 16 contributions in Grassland Science were made at the Grassland Society of South Africa, five at the Arid Zone Ecology forum and five at an international Cactus Pear Conference in Bloemfontein. The Cactus Pear Conference was presented by the Centre for Plant Health Management (CePHMa) at the UFS. In Animal Science, a total of 30 contributions

were made at the conference of the South African Society for Animal Science, with all members in Animal Science making contributions. Prof. De Waal also made a contribution in Animal Science at the International Cactus Pear Conference in Bloemfontein.

Prof. Snyman was awarded the Compton prize by the *South African Journal of Botany* for the best article investigating the influence of fire on the dynamics and functioning of a grassland ecosystem - another feather in the cap for the department.

Prof. Van der Merwe is currently conducting contract research with Meadow Feeds and the National Lucerne Organisation. A substantial donation of R191 000 was obtained by Prof. Greyling, Ms Lehloeny and Mr De Witt from Alexander Forbes for community service and specifically for the small-scale chicken project in rural areas. The data generated here could be used in future research projects.



Prof. Japie van Wyk, Mr Mike Fair and Prof. Frikkie Naser attended and made presentations regarding livestock production at an Animal Breeding World Congress in Brazil.



Great success was achieved in co-ordinating and documenting all relevant research done on wild carnivores. A course in Applied Nutrition in Wild Herbivores and Carnivores was established in the African Large Predator Research Unit in 2005 – an aspect that is generating great interest amongst students and the industry.

Academic staff

Professors: Proff. Johan Greyling, Nico Smit, Hennie Snyman, Hentie van der Merwe, Japie van Wyk

Professors Extraordinary: Proff. Amie Aucamp, Schalk Cloete, James Hayes, Naida Loskutoff, Machiel Scholtz

Associate Professors: Proff. H.O. de Waal, Erhard du Toit, Frikkie Nesor

Senior Lecturers: Dr Luis Schwalbach, Mr Wikus Vorster (contract)

Lecturer: Messrs Mike Fair, Paul Malan, Ms Khoboso Lehloenyana

Junior Lecturers: Messrs Foch de Witt, Ockert Einkamerer

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Research outputs

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Statistical data of the faculty



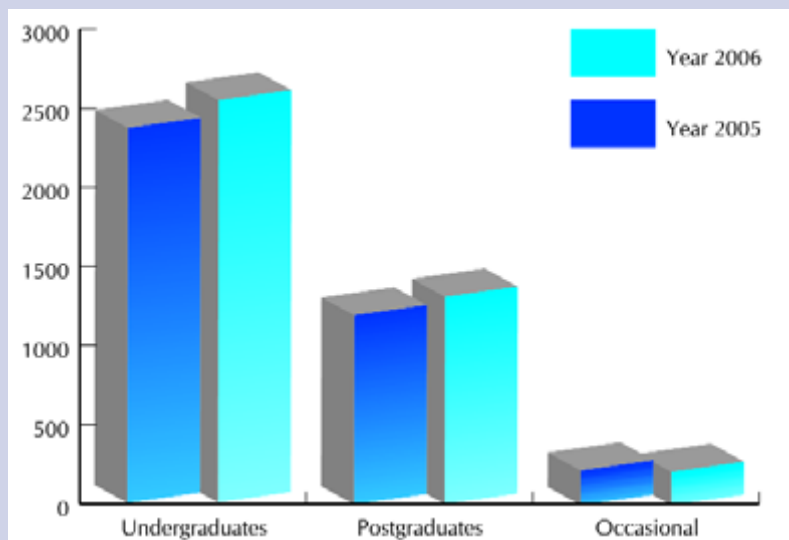
Student figures

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
Total 2005	1111	56	45	1141	2353
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
Total 2006	1182	51	39	1222	2494

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
Total 2005	870	62	24	626	1582
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
Total 2006	987	56	36	651	1730

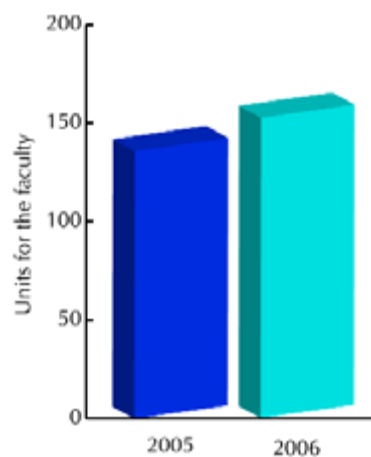
Total					
2005					
Description	African	Coloured	Indian	White	Total
Undergraduate	1239	72	37	1118	2466
Postgraduate	557	38	26	621	1242
Occasional	185	8	6	28	227
Total 2005	1981	118	69	1767	3935
2006					
Description	African	Coloured	Indian	White	Total
Undergraduate	1370	67	38	1169	2644
Postgraduate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



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
Total	3935	4224

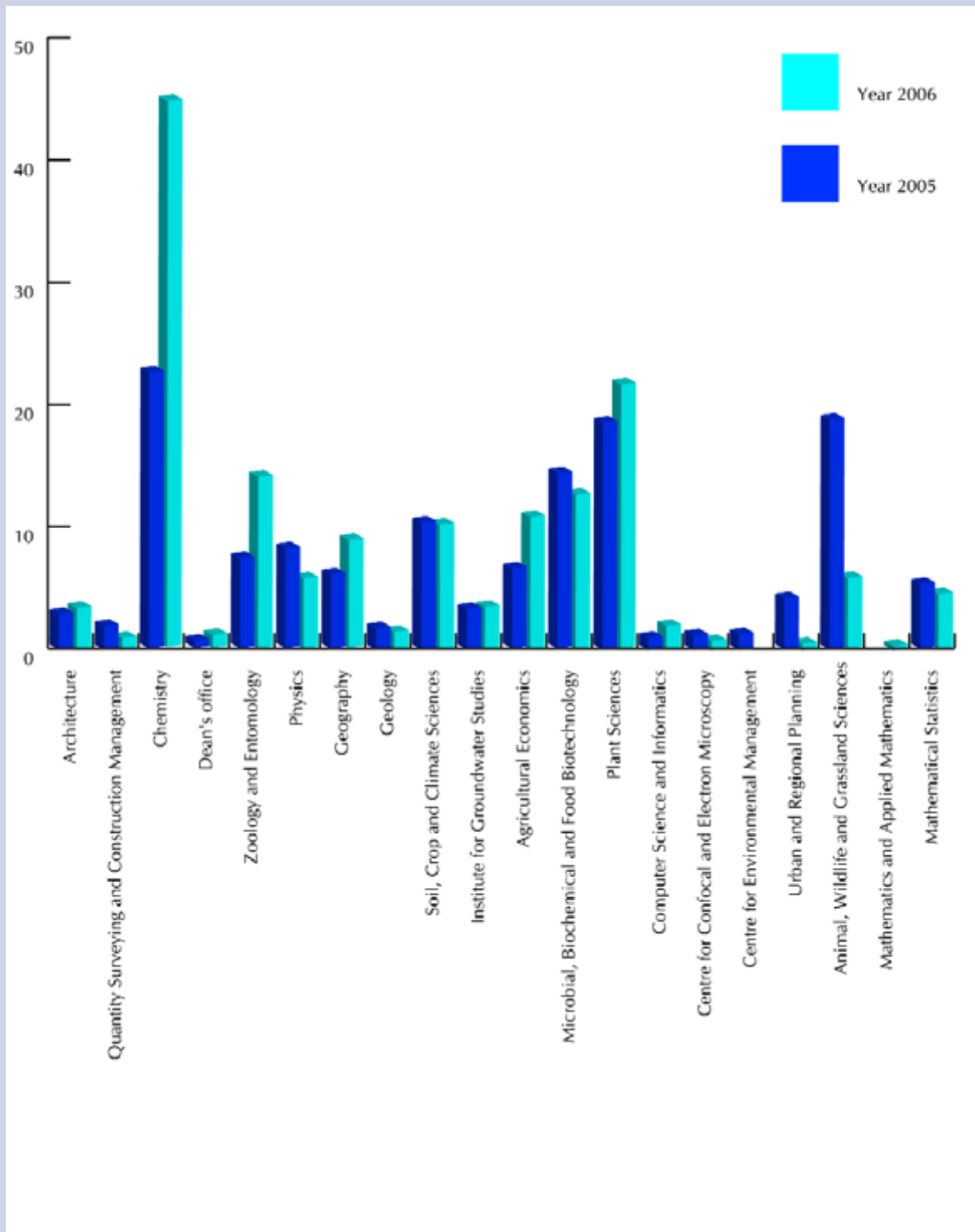
Research outputs for the Faculty of Natural and Agricultural Sciences



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

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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	T		UWC	University of the Western Cape
SASAS	South African Society for Animal Science	THRIP	South African National Research Foundation Thrust for Industry-Related Projects	W	
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	U		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		