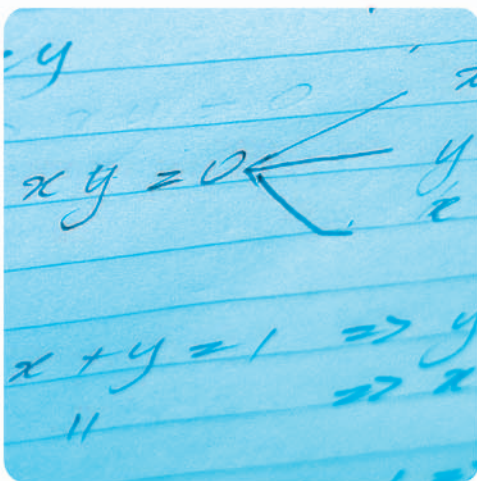


Faculty of Natural and Agricultural Sciences

Report 2008



Faculty of

**Natural and
Agricultural Sciences**

Report 2008

Issued by

Faculty of Natural and Agricultural Sciences
University of the Free State

Editorial compilation

Lacea Loader

Language revision

Nanette Lötter
Corrie Geldenhuys

Revision of bibliographical data

Mercia Coetzee

Layout and cover design

Chrysalis advertising and publishing

Photographers

Leonie Bolleurs
Stephen Collett
Reinier Brönn

Printing

Bloemfontein Repro Services

The Afrikaans version is also available on a compact disc from the dean's office or on the university's website at www.ufs.ac.za

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Preface

From the Dean's Office

In 2008 the Faculty of Natural and Agricultural Sciences once again lived up to its vision to be acknowledged as a faculty that is at the forefront of the practice of natural and agricultural science where the highest levels of quality and credibility are reflected.

During the year the faculty not only remained one of the leaders in training and career development in the natural and agricultural sciences, but it also made a concerted effort to enlarge its international footprint and to establish itself internationally. This is evident in the visits of staff from the faculty to universities such as the USA-based University of Minnesota and Virginia Polytechnic Institute and State University (Virginia Tech) and the extension of international agreements between the University of the Free State (UFS) and these institutions. The faculty also had the privilege of hosting a high-level delegation from the University of Minnesota on the Main Campus in Bloemfontein in August 2008.

The turmoil in the international markets firstly led to very high oil prices, which spilt over to the grain markets and high food prices. This, in turn, led to high inflation levels and therefore high interest rates. Eventually the exchange rate also deteriorated against the major currencies. In the latter part of the year the whole situation was turned upside down with the collapse of the financial markets. The faculty did not escape this and the price of equipment for which orders were placed sky rocketed. Innovative skills had to be applied to remain on track with our equipment strategy.

Although 2008 was an exceptionally difficult year for the UFS and the institution had to bear the brunt of the Reitz video and the reaction of the national and international community, the faculty still managed to perform and expand its core business.

The faculty offers multi-disciplinary and holistic courses to send skilled and capable students into the South African workplace and to empower the labour force. Our general and extended programmes are continuously assessed and improved in order to improve our throughput rates and quality of teaching.

The staff at the faculty worked tirelessly this year to broaden our product offering and to provide our students with the best quality teaching in the country. I applaud their efforts of expanding capacity, developing programmes and strengthening re-



Prof. Herman van Schalkwyk.

lationships both within and outside the faculty and the university.

I also want to applaud the staff and students of the faculty with their achievements this year – whether it is on a personal level, in their capacity as staff member of their respective department/centre or for the faculty. To mention a few:

- Ms Estelle Heideman HIV/Aids coordinator of the Lengau Agricultural Development Centre, received a bursary to participate in a leadership programme in the United States of America (USA), which trains female leaders in South Africa who contribute to the prevention of HIV at a local, regional and national level;
- In the Department of Agricultural Economics, Prof. Johan Willemse, known for his contribution towards agriculture, was appointed on the non-executive board of Absa;

Staff in the dean's office



The staff working in the dean's office are, from the left, front: Ms Stefanie Naborn, Manager: Marketing and Liaison, Ms René Bloem, Secretary, Prof. Neil Heideman, Vice-Dean: Faculty of Natural and Agricultural Sciences; back: Mr Clasia Claassen, Assistant Administrative Officer, Mr Johan Kruger, Faculty Manager, Ms Lorinda Rust, Secretary, and Ms Mitzie Cloete, Typist/Clerical Assistant.

- Prof. James du Preez, Departmental Chair of the Department Microbial, Biochemical and Food Biotechnology, received the silver medal for exceptional published research awarded at the biennial conference of the South African Society for Microbiology hosted in Graham's Town. It was only the seventh time since 1986 that the medal was awarded;
- A study of the UFS about how the change in the packaging of DNA with cellular development is influenced by the expression of genes, in which Prof. Hugh Patterson played a leading role, was published in a leading peer-reviewed scientific journal *Proceeding of the National Academy of Sciences* of the USA (PNAS). The PNAS journal has an impact factor of 10, which means that studies published in this journal are referred to by ten other scientific studies within the scope of two years;
- Prof. Riaan Luyt, professor in Chemistry and head of the Natural Sciences Programme at the Qwaqwa Campus, received an honorary medal from the Polymer Institute of the Slovak Academy of Sciences during a conference hosted in the High Tatras mountains of Slovakia;
- Prof. Maryke Labuschagne from the Department of Plant Sciences was the recipient of the National Science and Technology Forum's (NSTF) research capacity-development award. A team consisting of Prof. Jan van der Westhuizen and Dr Susan Bonnet from the Department of Chemistry, Prof. Kenneth Swart and Prof. Thinus van der Merwe from FARMOVS-PAREXEL also

received the innovation award for an outstanding contribution to science, engineering and technology by either an individual or a team over the last ten years from the NSTF;

- Prof. Maryke Labuschagne received a second prestigious national award for her research when the 2008 Cereal Science and Technology - SA's (CST-SA) Award for research and development was awarded to her; and
- Prof. Ivan Horak, extraordinary professor at the university's Department of Zoology and Entomology, became the third person in the history of the UFS to receive the D.Sc. degree.

In closing I would like to thank the faculty's lecturing staff for their support and enthusiasm during the past year. However, none of these achievements would have been possible without the interest and hard work of the administrative staff.

During 2008 we have all worked together to live up to the faculty's motto: "There is no substitute for excellence!" This report covers the activities of the faculty in 2008. It is a reflection of a year's commitment from a team of highly skilled academic and support staff.

Prof. Herman van Schalkwyk
Dean: Faculty of Natural and Agricultural Sciences
University of the Free State

Faculty news

Successful visit from delegation of the University of Minnesota

A senior delegation from the University of Minnesota in the United States of America (USA) paid a very successful visit to the University of the Free State (UFS) in May 2008 to explore ways of strengthening already existing ties between the two institutions.

Teacher training, capacity building in health sciences and student preparedness were among the areas of cooperation that were investigated, within the context of the Strategic Academic Cluster initiative of the UFS. Poverty reduction strategies were also a strong focus area.

The Faculty of Natural and Agricultural Sciences has had a cooperation agreement with the University of Minnesota's Department of Applied Economics since 2002 and the exchange of staff



During the visit are, from the left: Prof. Herman van Schalkwyk, Dean: Faculty of Natural and Agricultural Sciences at the UFS, Prof. Robert Jones, Senior Vice-President: System Academic Administration at the University of Minnesota, Dr Meredith Quiad, Associate Vice-President and Dean: International Programmes, University of Minnesota, Prof. Teuns Verschoor, Acting Rector of the UFS and Prof. Ezekiel Moraka, Vice-Rector: Student Affairs at the UFS.

has been taking place on a regular basis. This agreement will be expanded and both institutions are now exploring the possibility of

applying it across faculties. Both institutions have committed seed funding to formalise the cooperation agreement.

50 years of Agriculture celebrated



The faculty celebrated 50 years of the teaching of agriculture at the UFS in November 2008. Part of the celebrations was a seminar with the theme "Challenges in a changing agricultural environment". Some of the guest speakers are, from the left: Mr Corwyn Botha, Chairman: Agri Business Chamber and Managing Director of the Cape Agri Group, Mr Motsepe Matlala, President of NAFU, Mr Hans van der Merwe, Executive Head: Agri SA, Prof. Herman van Schalkwyk: Dean: Faculty of Natural and Agricultural Sciences at the UFS, and Mr Sugar Ramakarane, Head: Department of Agriculture, Free State Province.

Winners of NSTF awards assist with recruitment of students



Here are, from the left: Dr Martin Ntwaeaborwa, senior lecturer at the Department of Physics and finalist in the category for black researchers, Prof. Kenneth Swart, FARMOVS-PAREXEL, Prof. Maryke Labuschagne, head of Plant Breeding at the UFS's Department of Plant Sciences and female recipient of the award for the development of research capacity over the past five to ten years, and Prof. Jan van der Westhuizen, Department of Chemistry at the UFS; front: Ms Kedibone Aphane, MRC. Prof. Swart and Prof. Van der Westhuizen were the leaders of the team who received the award for the development of innovation by a corporate organisation or institution.

Representatives of the South African Medical Research Council (MRC) visited the UFS to recruit students who want to study in the fields of sci-

ence, engineering and technology. To assist with the recruitment, the winners of awards made by the National Science and Technology Forum (NSTF) earlier this year,

made presentations to create an interest amongst students. The UFS had four finalists of whom two were the winners in their respective categories.

Young scientists learn what faculty can offer



Young science lovers gathered in Sasolburg for the annual Sasol TechnoX in August 2008. The faculty's exhibition captured the learners' attention through an interactive representation of the application fields of science. Delegates from the Departments of Mathematics and Applied Mathematics, Chemistry, Zoology and Entomology, as well as UFS Marketing stood ready to answer the questions of the 20 832 learners who attended the event. Pictured here is Theo Viljoen, M.Sc. student in Forensic Entomology, sharing interesting facts regarding insects with learners.

Two UFS academics appointed on the Land Bank Board



Prof. Herman van Schalkwyk (left), Dean: Faculty of Natural and Agricultural Sciences, and Mr Theo Potgieter from the UFS School of Management were appointed on the Land Bank Board in March 2008. Prof. van Schalkwyk was appointed as Director and Deputy Chairperson and Mr Potgieter as Director of the Board. The appointments were made by the Minister of Agriculture and Land Affairs, Ms Lulu Xingwana, and are effective for a period of four years.

UFS extends exchange agreement with USA university



Here are, from the left, front: Dr SK de Datta, Vice-Rector: International Affairs, VT, Prof. Herman van Schalkwyk, Dean of the Faculty of Natural and Agricultural Sciences, UFS, Dr Martin Ntwaeaborwa, senior lecturer at the Department of Physics, UFS; back: Prof. Jim McKenna, Department of Crop, Soil and Environmental Affairs, VT, Prof. Izak Groenewald, Director of the Centre for Sustainable Agriculture and Rural Development at the UFS and responsible for the faculty's international liaison, Dr Michael Bertelsen, VT's international office, Dr Aldo Stroebel, Head: Internationalisation at the UFS and Dr Liesel Herselman, senior lecturer at the Department of Plant Sciences, UFS.

A delegation from the faculty visited the Virginia Tech University (VT) in the USA in June 2008 to confirm and extend the existing student exchange agreements between the two institutions.

During the visit the agreement, which started in 1997, was extended for the next five years. More than 150 students from both institutions have already taken part in this exchange agreement and it is the most successful student exchange agreement that VT is involved in. Although agricultural students from the UFS initially took part in the agreement, it was extended to other departments in the faculty and also to the rest of the UFS.

Itjoriseng Project launched



The faculty launched the Itjoriseng Project on the Main Campus in Bloemfontein in March 2008. The aim of the project is to improve the skills of teachers in the subjects Mathematics and Physical Science for Grades 10–12. "Itjoriseng" is the Sotho word for "sharpen yourself". At the launch were, from the left: Mr Mzamo Jacobs, Director: Curriculum Development for Further Education and Training, Free State Department of Education, Mr Johan Kruger, Faculty Manager, Ms Elna Marais, Chief Education Specialist: Curriculum Development, Free State Department of Education, and Prof. Herman van Schalkwyk, Dean: Faculty of Natural and Agricultural Sciences at the UFS.

2007 Faculty report launched



The faculty once again produced another report in which the various departments and centres highlighted their activities for 2007. The report was so well received that a second edition had to be printed. Here are some of the departmental chairpersons during the launch of the report in June 2008.

Centre for

Sustainable Agriculture and Rural Development

"The international component of the total student count is approximately 35%." - Prof. Izak Groenewald

Overview

The Centre for Sustainable Agriculture and Rural Development affords postgraduate students the opportunity to acquire multi-disciplinary skills and knowledge in sustainable agricultural practices through distance education.

Research which focuses on rural development, value-adding chain, agribusiness management, and crop and livestock production is aimed at the development and maintenance of sustainable agricultural production systems.

New entrants to this programme originate from all spheres of life and have a common goal: to study the science of sustainability and agricultural development. The majority of students are in the full time employ of the Department of Agriculture and the Agricultural Research Council (ARC), whilst others are part-time, commercial or small farmers, working for agricultural input suppliers, banks and consultancies. The international component of the total student count is approximately 35%.

The course content is scrutinised annually by local and international partners to ensure local applicability and relevancy and also to remain internationally sound. In 2008, 50 students were allowed access to the programme from more than 100 enquiries.

During the year 2008, an all-time record of 30 master's degrees in Sustainable Agriculture



Prof. Izak Groenewald.

(MSA) were awarded. This was the culmination of many months of hard work for these graduates, who study on a part time basis whilst working full time. This also brings the total number of MSA degrees awarded since 1994 (when the centre started) to 183.

The centre has a proud track-record of its graduates. They leave the programme well equipped to address the challenges of modern agriculture as depicted by ever-changing environmental constraints and challenges. Technological, managerial and thinking skills are developed and embedded in the programme. Some top achievers are:



- Mr Z Pityi: Senior Manager, Department of Agriculture, Eastern Cape
- Mr D Bese: Senior Manager, Department of Agriculture, Eastern Cape
- Ms E van Aswegen: Finalist, Agricultural Women Entrepreneur of 2008
- Mr P Verkuil: Vice Chairperson, Board of Suid-Wes Landbou
- Mr JB van den Berg: Provincial and National winner, Young Farmer of 2008

Mr JB van den Berg from Bothaville was honoured as the Free State's Young Farmer of the Year and was also named the National Young Farmer of the Year 2008.



Mr JB van den Berg, Ph.D. student at the centre who was named National Young Farmer of the Year 2008 and his wife, Cornél.

In 2004 Mr Van den Berg received his master's degree on the application of strategic planning and marketing in sustainable wheat production. In 2008 he registered for Ph.D. studies at the centre. He is the sole shareholder in the farming company JBT Boerdery. His turnover doubled from 2005 to 2007 and his farm's profits also increased.

Ms Stella Heyns' exceptional achievement was the obtaining of a first place in all four of the evaluation categories of the international GLO-BUS business strategy simulations. GLO-BUS, used by the centre, is the world's first real international simulation focusing

on competitive business strategy. The GLO-BUS exercise is done online and students do not only compete in class, but also on an international level against other registered students.

International linkages:

The centre was involved in several international linkage activities and two student exchange programmes were managed. Long-term discussions with Dronten Professional Agricultural University, The Netherlands resulted in the signing of a memorandum of understanding (MOU) which will facilitate the mutual exchange of undergraduate students and staff members. Through this MOU the University of the Free State (UFS) has acquired entry to several other academic institutions in Europe.

The long-standing student exchange programme with Virginia Polytechnic Institute and State University (Virginia Tech) in the United States of America (USA) was extended for a third term of five years during of a UFS delegation to Blacksburg, Virginia. This MOU was also expanded to encompass the whole of the UFS and not only the programme of the Faculty of Natural and Agricultural Sciences or the faculty's agriculture programme.

During the second semester of 2008 five students from the UFS

were exchanged with students of Virginia Tech. The beauty of this exchange is that credits obtained at Virginia Tech are transferred to the UFS, thus not prolonging their period of study for a specific degree. In total, 131 students have taken part in this programme over the past ten years.

Prof. Herman van Schalkwyk, Dean of the Faculty of Natural and Agricultural Sciences, Prof. Izak Groenewald, Director of the Centre for Sustainable Agriculture and Rural Development, and members of staff also paid a successful visit to the University of Minnesota in the USA in June 2008. They visited among others the Minnesota Council on Economic Education (MCEE) and had talks with a representative of Cargill Inc., the world's largest privately owned corporation. There is a good possibility that substantive financial support will result from this interaction between the UFS and the University of Minnesota.

Prof. Groenewald was re-appointed to the editorial board of the *Journal for Sustainable Agriculture*, an internationally recognised scientific journal.

Regional linkages

Several regional workshops were undertaken to visit research sites of current MSA students, to expand cooperation agreements and recruit new students. Currently, the centre has 20 master's and two Ph.D. students in Namibia.

Local linkages

Prof. Groenewald, because of his expertise in phosphate supplementation for free-grazing ruminants, has been re-appointed on a national panel of experts to investigate the occurrence of arthrosis, an occurrence which resembles P-deficiency but with specific other properties that result in lower animal performance and eventual mortality.

Prof. Groenewald is invited regularly as guest speaker to farmers' meetings and congresses. He also gives technical and professional support to major feeding companies as a registered animal scientist. ■



The centre honoured students receiving their master's degrees in Sustainable Agriculture during the autumn graduation ceremony. In 2008 the centre boasted the most graduandi of all the faculty's centres. Here are, from the left: Prof. Hennie Snyman, professor in the Department of Animal, Wildlife and Grassland Sciences at the UFS, Ms Poppy Makabanyane, Agricultural Research Council's (ARC) Onderstepoort Veterinary Institute, Mr Phillip Maake, Department of Agriculture, Limpopo, Ms Makhosi Buthelezi, ARC in Rustenburg, and Prof. Izak Groenewald, Director: Centre for Sustainable Agriculture and Rural Development at the UFS.



Students from the UFS on their way to Virginia Polytechnic Institute and State University (Virginia Tech) in the United States of America (USA) as part of the exchange programme between the UFS and Virginia Tech. Here are, from the left, front: Roean Wessels, Magriet van der Linde and Roto Ongezwa; back: Marcel Heine and Prof. Izak Groenewald, Director of the Centre for Sustainable Agriculture and Rural Development. Charles Tharaga joined the group at the Oliver Tambo International Airport. The students spent the second semester of 2008 in the USA.



During the visit to the Minnesota University in the USA are, from the left, back: Prof. Herman van Schalkwyk, Dean: Faculty of Natural and Agricultural Sciences at the UFS, Prof. Izak Groenewald, Director: Centre for Sustainable Agriculture and Rural Development at the UFS, and Mr Tim Bodin, member of the MCEE council of directors and economist from Cargill Inc.; front: Dr Nona Mason, chairperson of the Minnesota Council on Economic Education (MCEE) and director of the master's programme in Business Communication at the St. Thomas University, and Prof. Claudia Parliament, executive director of the MCEE and professor in the Department of Applied Economics at the University of Minnesota. Prof. Parliament completed her sabbatical leave at the UFS in 2008.

Research outputs

Research articles

Esterhuizen, J., Groenewald, I.B., Strydom, P.E. & Hugo, A. 2008. The performance and meat quality of Bonsmara steers raised in a feedlot, on conventional pastures or on organic pastures. *South African Journal of Animal Science* 38(4): 303-314.

Stroebel, A., Swanepoel, F.J.C., Nthakheni, N.D., Nesamvuni, A.E. & Taylor, G.J. 2008. Benefits obtained from cattle by smallholder farmers: A case study of Limpopo Province, South Africa. *Australian Journal of Experimental Agriculture* 48: 825-828.

Swanepoel, F.J.C., Taylor, G.J., Webb, E.C. & Stroebel, A. 2008. Effect of nu-

trition on testicular traits of tropically adapted yearling beef bulls. *Australian Journal of Experimental Agriculture* 48: 950-953.

Taylor, G.J., Swanepoel, F.J.C., Webb, E.C. & Stroebel, A. 2008. Effect of heifer frame size on their subsequent reproductive performance and preweaning performance of their calves. *Australian Journal of Experimental Agriculture* 48: 945-949.

Reports

Swanepoel, F.J.C., Stroebel, A., Van Rooyen, J.C. & Sebolai, O.

Collaboration

Collaboration with the following institutions has been established and maintained in various ways:

- University of Namibia
- University of Virginia
- University of Cornell
- Royal Agricultural College, United Kingdom
- Dronten Professional Agricultural University – The Netherlands
- University of Wageningen – the Netherlands
- Departments of Agriculture: Western Cape, Eastern Cape, Free State and Limpopo.

Staff

Professor: Prof. Izak Groenewald

Professors Extraordinary: Profs Frans Swanepoel, Edward Nesamuvuni, Alice Pell

Senior Researchers: Dr Aldo Stroebel

Research Associate: Mr Johan van Niekerk (Ph.D. student and lecturer)

Programme Coordinator: Ms Mia Kirsten

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2008. *Programme framework and programme guide for Agricultural Centres of Excellence (CoE)*. Report to Department of Agriculture and Land Affairs, Pretoria, South Africa.

Swanepoel, F.J.C., Van Rooyen, J.C., Stroebel, A. & Sebolai, O. 2008. *Programme framework and programme guide for the Agricultural Technology and Human Resources Programme (ATRHP)*. Report to the Department of Agriculture and Land Affairs, Pretoria, South Africa.

Conference contributions

Greeff, P.F., Laubscher, J.M. & Groenewald, I.B. 2008. *Pathway to sustainable apple production systems*. Paper presented at the Annual South African Society of Crop Production Conference, Strand, South Africa. 23 January.

Langa, T., Nkosi, B.D., Meeske, R., Groenewald, I.B. & Palic, D. 2008. *The effect of Bonsilage maix Flussig and Lalsil Fresh LB on the fermentation and aerobic stability of whole crop maize silage*. Poster presented at the 10th World Conference on Animal Production (WCAP), Cape Town International Convention Centre, Cape Town, South Africa. 23-28 November.

Madzivhandila, P., Groenewald, I.B., Griffith, G. & Fleming, E. 2008. *Continuous improvement and innovation as an approach to effective research and development: A trident evaluation of the Beef Profit Partnership project*. Paper presented at the 52nd Annual Conference of the Australian Agriculture Resource Economics Society (AARES): Biophysical Modelling and Performance Measurement, Rydges Lakeside, Canberra, Australian Capital Territory, Australia. 5-8 February.

Mudau, J.N., Nesamvuni, A.E., Nephawe, K.A., Norris, D. & Groenewald, I.B. 2008. *Prediction of body weight of indigenous chickens in Limpopo Province of South Africa*. Poster presented at the 10th World Conference on Animal Production (WCAP), Cape Town International Convention Centre, Cape Town, South Africa. 23-28 November.

Mudau, K.S., Nesamvuni, A.E., & Belemu, N.D. 2008. *Achievements in*

Vhembe District through Commodity Partnership Model. Paper presented at the 42nd Annual Conference of the South Africa Society for Agricultural Extension, Tsitsikamma Conference Centre, Port Elizabeth, South Africa. 5-6 May.

Nesamvuni, A.E. & Liphadzi, K.B. 2008. *Demand & supply of pasture scientists: A case of Limpopo Department of Agriculture*. Paper presented at the 43rd Annual Congress of the Grassland Society of Southern Africa, Badplaas, Mpumalanga, South Africa. 21-25 July.

Nkosi, B.D., Langa, T., Meeske, R., Groenewald, I.B. & Palic, D. 2008. *The effect of Bonsilage maix Flussig and Lalsil Fresh LB on the fermentation and aerobic stability of whole crop maoze silage*. Poster presented at the 10th World Conference on Animal Production (WCAP), Cape Town International Convention Centre, Cape Town, South Africa. 23-28 November.

Nkosi, B.D., Leeuw, K.J., Ratsaka, M.M., Palic, D., Langa, T. & Groenewald, I.B. 2008. *The effect of dietary inclusion of beetroot wastes on the growth performance of lambs*. Poster presented at the 59th Annual Meeting of the European Association for Animal Production, Vilnius, Lithuania. 24-27 August.

Nkosi, B.D., Meeske, R., Groenewald, I.B., Palic, D. & Langa, T. 2008. *The effect of Lalsil Fresh LB on the fermentation and aerobic stability of ensiled TMR potato hash*. Poster presented at the 10th World Conference on Animal Production (WCAP), Cape Town International Convention Centre, Cape Town, South Africa. 23-28 November.

Pell, A.N., Stroebel, A. & Kristjanson, P. 2008. *What works, what doesn't and why: Development projects that make a difference*. Paper presented at the Satellite Symposium on the Role of Livestock in Developing Communities: Enhancing Multifunctionality, during 10th World Conference on Animal Production (WCAP), Cape Town International Convention Centre, Cape Town, South Africa. 23-28 November.

Stroebel, A. & Swanepoel, F.J.C. 2008. *Cultivating knowledge and skills to grow African agriculture – An analyses and synthesis*. Paper

presented at the Agricultural Education and Training Initiatives in Africa, Southern African Networking and Clarification Workshop, Manzini, Swaziland. 3-4 October.

Stroebel, A. & Swanepoel, F.J.C. 2008. *Summary of lessons from previous AgriBEE showcasings*. Paper presented at the 3rd Annual AgriBEE Networking and Showcasing Event, Cape Town International Convention Centre, Cape Town, South Africa. 21 February.

Stroebel, A., Swanepoel, F.J.C., Nthakheni, N.D., Nesamvuni, A.E. & Taylor, G.J. 2008. *Benefits obtained from cattle by smallholder farmers: A case study of Limpopo Province, South Africa*. Paper presented at the 27th Biennial Conference of the Australian Society for Animal Production, University of Queensland, Brisbane, Australia. 23-27 June.

Swanepoel, F.J.C., Gaofhiwe, D. & Sebolai, O. 2008. *A focussed approach to research development: Case study of the University of the Free State*. Paper presented at the Annual International Meeting of the USA Society for Research Administrators (SRA), Washington DC, USA. 9-13 October.

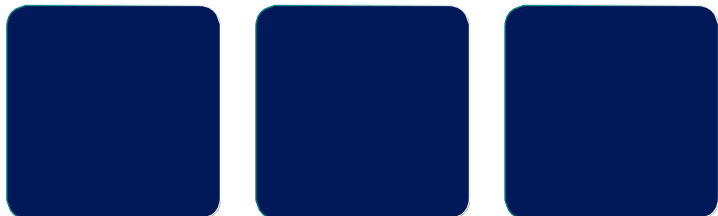
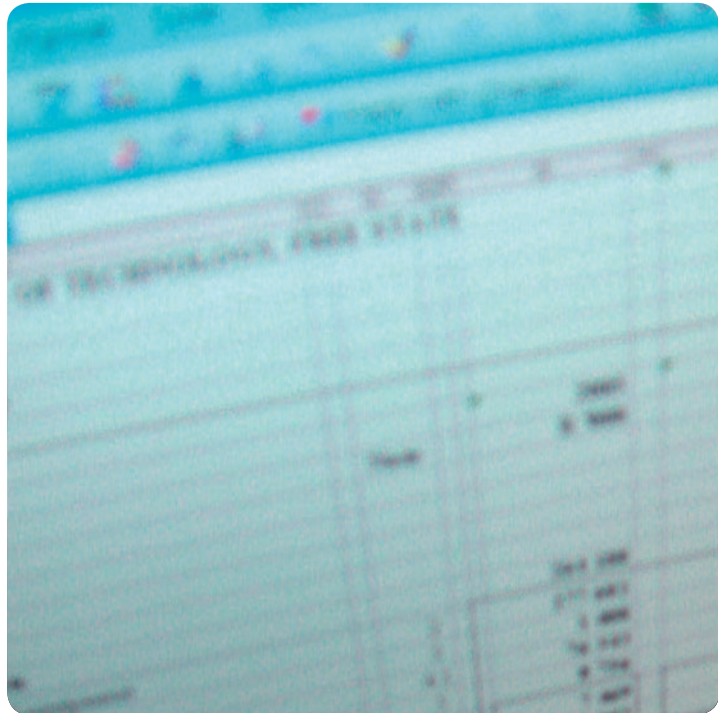
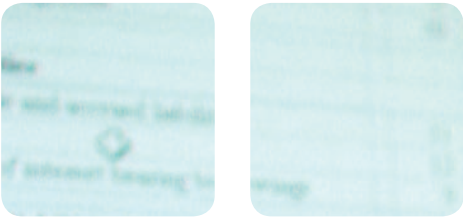
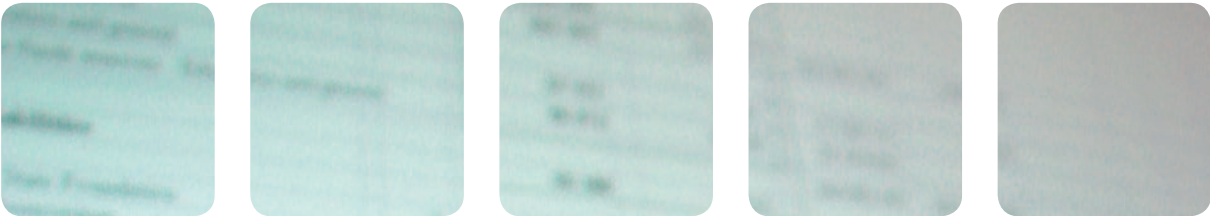
Swanepoel, F.J.C., Kriel, L. & Gaofhiwe, D. 2008. *Strategic academic clusters*. Paper presented at the 7th Southern African Research and Innovation Management Association (SARIMA) Conference, Stellenbosch, South Africa. 3-6 June.

Swanepoel, F.J.C., Taylor, G.J., Webb, E.C. & Stroebel, A. 2008. *Effect of nutrition on testicular traits of tropically adapted yearling beef bulls*. Paper presented at the 27th Biennial Conference of the Australian Society for Animal Production, University of Queensland, Brisbane, Australia. 23-27 June.

Taylor, G.J., Swanepoel, F.J.C., Webb, E.C. & Stroebel, A. 2008. *Effect of heifer frame size on their subsequent reproductive performance and pre-weaning performance of their calves*. Paper presented at the 27th Biennial Conference of the Australian Society for Animal Production, University of Queensland, Brisbane, Australia. 23-27 June.



Statistical data

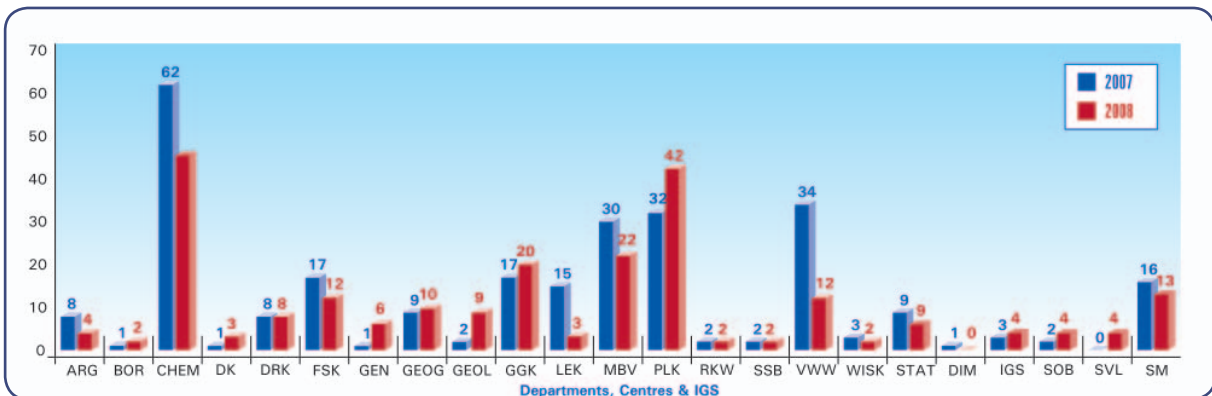


Research outputs: 2007-2008

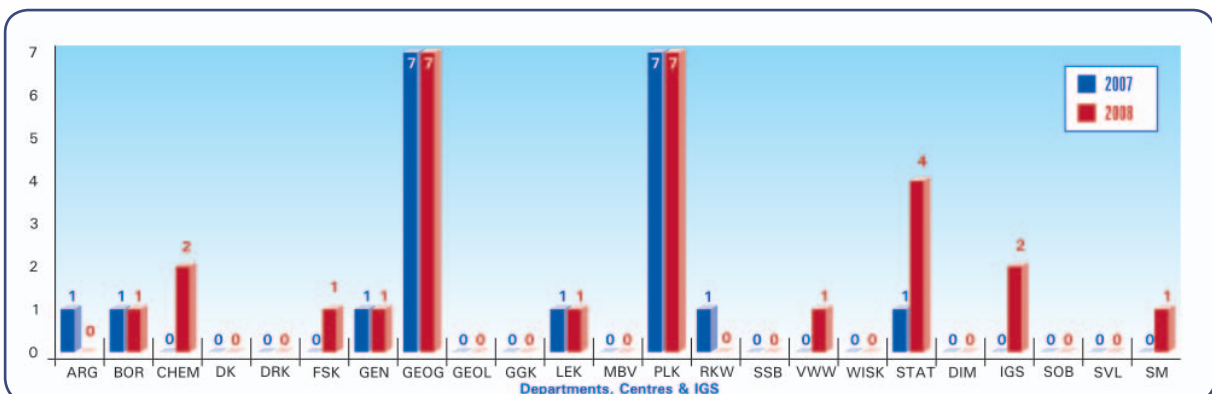
List of abbreviations

Abbreviation	Name	Abbreviation	Name
ARG	Department of Architecture	GGK	Department of Soil, Crop and Climate Sciences
BOR	Department of Quantity Surveying and Construction Management	IGS	Institute for Groundwater Studies
SOB	Centre for Environmental Management	LEK	Department of Agricultural Economics
CEM	Department of Chemistry	MBV	Department of Microbial, Biochemical and Food Biotechnology
SM	Centre for Microscopy	PLK	Department of Plant Sciences
SVL	Centre for Sustainable Agriculture and Rural Development	RKW	Department of Computer Science and Informatics
DK	Dean's Office	SSB	Department of Urban and Regional Planning
DRK	Department of Zoology and Entomology	SRB	Disaster Management Training and Education Centre for Africa (DiMTEC)
FSK	Department of Physics	VWW	Department of Animal, Wildlife and Grassland Sciences
GEN	Department of Genetics	STAT	Department of Mathematical Statistics and Actuarial Science
GEOG	Department of Geography	WISK	Department of Mathematics and Applied Mathematics
GEOL	Department of Geology		

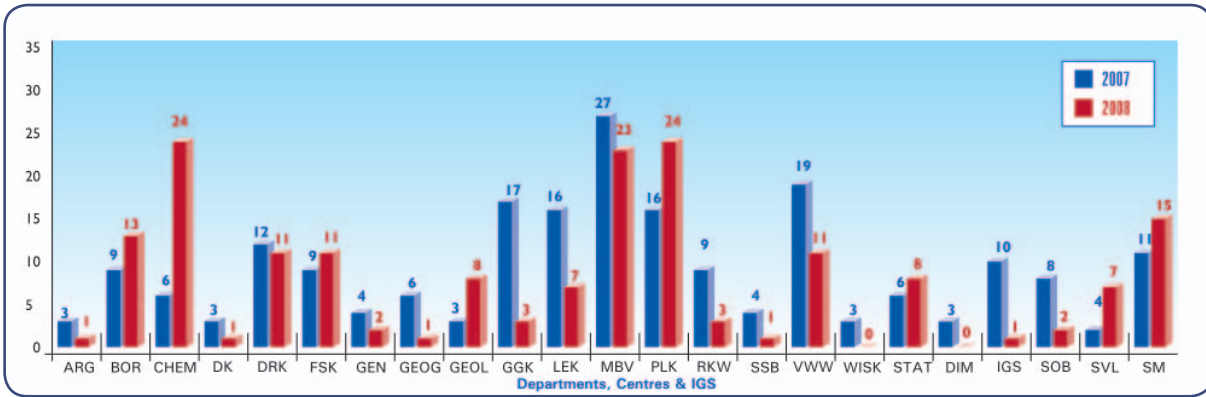
Accredited articles



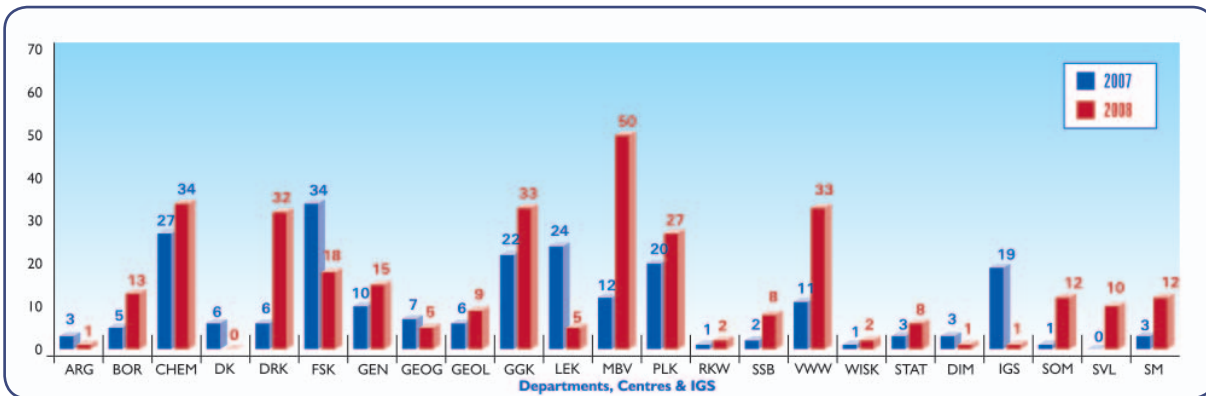
Books



International conferences



Local conferences



Student figures: 2007-2008

Student figures

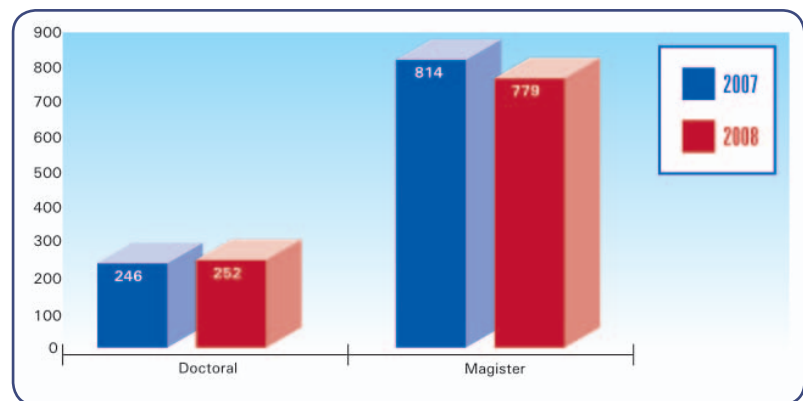
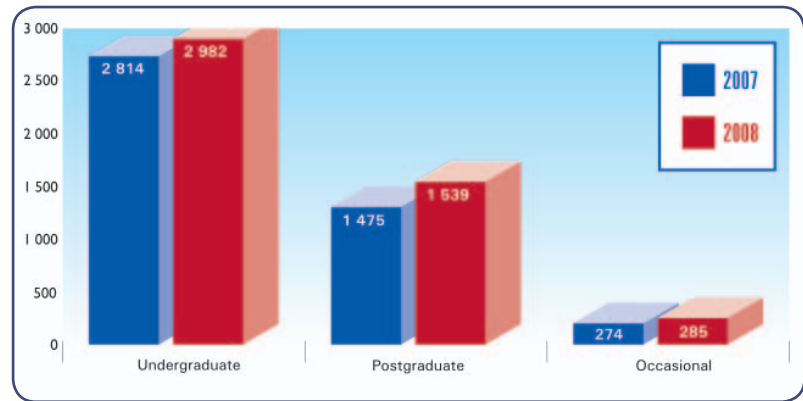
Year	Description	Black	Coloured	Asian	White	Total
2007	Undergraduate	1492	66	38	1218	2814
	Postgraduate	710	41	40	684	1475
	Occasional	230	6	2	36	274
*TOTAL		2432	113	80	1938	4563
2008	Undergraduate	1667	51	37	1227	2982
	Postgraduate	755	40	43	701	1539
	Occasional	260	5	1	19	285
* TOTAL		2682	96	81	1947	4806

International students

Nationality	Year	Year
	2007	*2008
Angola	2	0
Asian countries	20	24
Botswana	17	23
Democratic Republic of the Congo	0	1
European countries	9	10
Lesotho	118	144
Malawi	3	5
Mauritius	2	3
Mozambique	4	7
Namibia	54	65
North America	15	5
Other African countries	47	69
South America	1	0
Swaziland	5	6
Zambia	7	7
Zimbabwe	48	60
Total	352	429

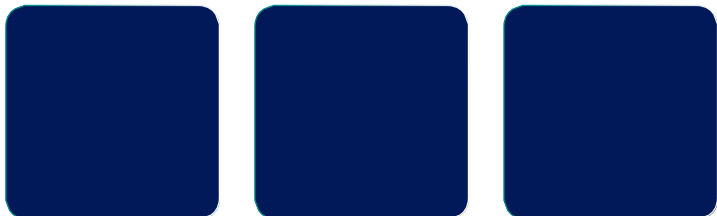
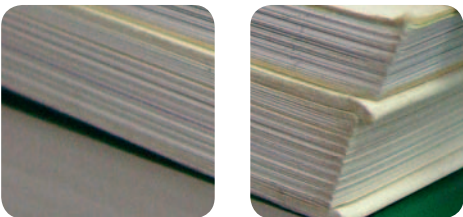
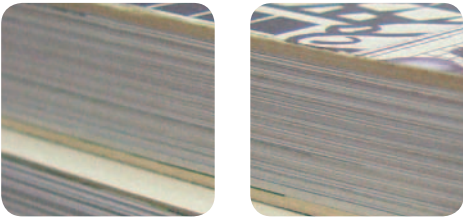
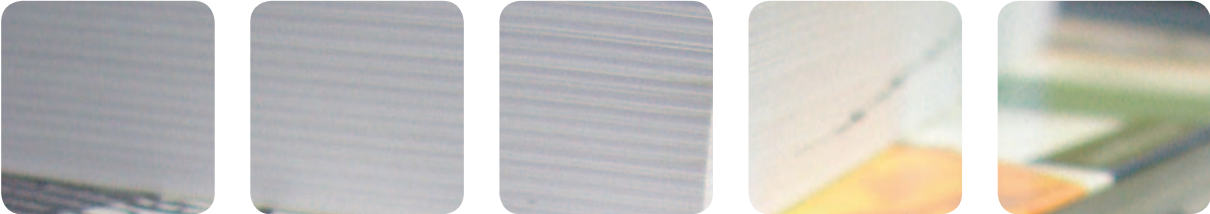
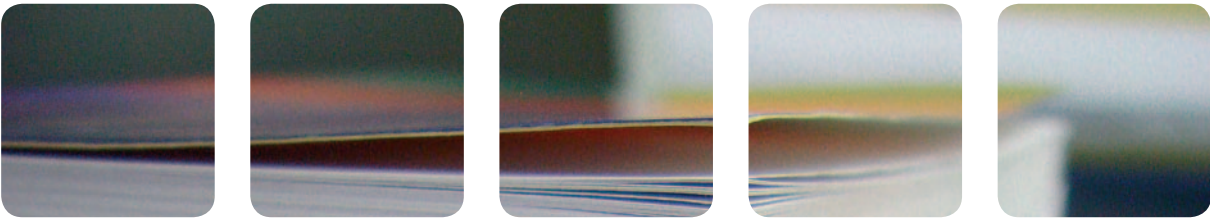
*2008 Final HEMIS figures not available

Comparison for the Faculty of Natural and Agricultural Sciences





Glossary



Glossary

A

AACC -	American Association for Cereal Chemists
AACE -	Association for the Advancement of Cost Engineering
ADF -	Amsterdam Density Functional Programme
ADG -	Average Daily Grain
AEASA -	Agricultural Economics Association of South Africa
AEON -	the African Earth Observation Network
AGU -	American Geophysical Union
AI -	Artificial Insemination
ARC -	Agricultural Research Council
ARV -	Antiretroviral
ASC -	Architecture Student Conference
ASAQS -	Association of South African Quantity Surveyors
ASOCSA -	Association of Schools of Construction of Southern Africa

B

BBSRC -	Biotechnology and Biological Sciences Research Council
BMBF -	Federal Ministry of Education and Research, Germany

C

CAA -	Commonwealth Association of Architects
CANSA -	Cancer Association of South Africa
CAB -	Centro de Astrobiología
CED -	Centre for Education Development
CePHMa -	Centre for Plant Health Management
CHESD -	Centre for Higher Education Studies and Development
CHPC -	Centre for High Performance Computing
CIDB -	Construction Industry Development Board
CIOB-SA -	Chartered Institute of Building, South Africa
CSIR -	Council for Scientific and Industrial Research Organisation
CSTA -	Cereal Science and Technology Association
CUT -	Central University of Technology

D

DiMTEC -	Disaster Management Training and Education Centre for Africa
DMISA -	Disaster Management Institute of Southern Africa
DRRW -	Durable Rust Resistance in Wheat
DST -	Department of Science and Technology
DWAF -	Department of Water Affairs and Forestry

E

ECA -	European Crystallographic Association
EGIC -	Economic Growth and International Competitiveness
EMSA -	Environmental Management Systems Association
EMS -	Environmental Management Systems
EPWP -	Expanded Public Works Programme

F

FAO -	Food and Agricultural Organisation
FETWater -	Framework Programme for Research Education and Training in Water
FMP -	Facilities Management Programme
FSRDPP -	Free State Rural Development Partnership Project
FTIR -	Fourier Transform Infra Red Spectrometer

G

FGAP -	Facility for Genomics and Proteomics
GIS -	Geographical Information Systems
GMO -	Genetically Modified Organisms
GRDM -	Groundwater Resource Directed Measures
GSSA -	Grassland Science Society of South Africa
GSSA -	Geological Society of South Africa

H

HCI -	Human-computer Interaction
HRTEM -	High Resolution Transmission Electron Microscopy

I

IAMA -	International Food and Agribusiness Management Association
IAU -	International Astronomical Union
ICACS -	International Conference on Atomic Collisions in Solids
ICCC -	International Conference on Coordination Chemistry
ICEC -	International Cost Engineering Council
ICRISAT -	International Crops Research Institute for the Semi-Arid Tropics
ICSU -	International Council for Science
IDC -	Industrial Development Corporation
IGC -	International Geological Congress
IGS -	Institute for Groundwater Studies
IMWA -	International Mine Water Association
INCRoP -	Insects on New Crops Programme
IPMP -	Intensive Project Management Programme
ISI -	International Statistical Institute
ISME -	International Society for Microbial Ecology
IT -	Information Technology
IUMS -	International Union of Microbiological Societies

L

LPI -	Lunar and Planetary Institute
LRAD -	Land Redistribution for Agricultural Development

M

MCEE -	Minnesota Council on Economic Education
MDC -	Maputo Development Corridor
MEC -	Member of the Executive Council
MNS -	Material and Nanosciences Cluster
MOU -	Memorandum of Understanding
MRC -	Medical Research Council
MSA -	Masters in Sustainable Agriculture
MSSA -	Microscopy Society of Southern Africa
MUCPP -	Mangaung University Community Partnership Programme

N

NAMC - National Agricultural Marketing Council
 NASA - National Aeronautics and Space Administration
 NASSP - National Astrophysics and Space Science Programme
 NBN - National Bioinformatics Network
 NCEE - National Council for Economic Education
 NDF - Neutral Detergent Fibre
 NECSA - Nuclear Energy Corporation of South Africa
 NERPO - National Emergent Red Meat Producers Organisation
 NGO - Non-Governmental Organisation
 NRF - National Research Foundation
 NSTF - National Science and Technology Forum
 NWGA - National Wool Growers' Association

O

OECD - Organisation for Economic Cooperation and Development

P

PAQS - Pacific Association of Quantity Surveyors
 PDMS - Provincial Disaster Management Centre
 PRT - Protein Research Trust

R

RDP - Redress and Development Programme
 RIBA - Royal Institute of British Architects
 RICS - Royal Institute of Chartered Surveyors
 RIEP - Research Institute of Education Planning
 RMMA - Red Meat Abattoirs Association
 RPO - Red Meat Producers Organisation
 RTPI - Royal Town Planning Institute

S

SA - South Africa
 SAAPMB - South African Association of Physicists in Medicine and Biology
 SAB - South African Breweries Limited

SABC - South African Broadcasting Corporation
 SACAP - South African Council for the Architectural Professions
 SACPCMP - South African Council for the Property Valuers Profession
 SACPLAN - South African Council of Planners
 SACQSP - South African Council for the Quantity Surveying Profession
 SADC - Southern African Development Community
 SAFA - South African Feedlot Association
 SAFEFE - South African Foundation for Economic and Financial Education
 SAFOI - South African Fryer Oil Initiative
 SAIA - South African Institute of Architects
 SAIM - Society for Industrial and Applied Mathematics
 SAISC - Southern African Institute of Steel Construction
 SANBI - South African National Biodiversity Institute
 SANCID - South African Commission on Irrigation and Drainage
 SANPAD - South African Netherlands Research Programme on Alternatives in Development
 SANSA - South African National Survey of Arachnida
 SAPOA - South African Property Owners Association
 SAPPS - Symposium of the South African Pecan Producers Association
 SAQA - South African Qualifications Authority
 SASA - South African Statistical Association
 SASHS - Southern African Society for Horticultural Sciences
 SASM - South African Society for Microbiology
 SAWMA - South African Wildlife Management Association
 SAWSS - Southern African Weed Science Society
 SCM - Scientific Computing and Modeling
 SEG - Society of Economic Geologists
 SEM - Scanning Electron Microscope

SLE - Senior Lecturer Equivalent
 SSSSA - Soil Science Society of South Africa
 SWMA - Southern African Wildlife Management Association

T

TEM - Transmission Electron Microscope
 THRIP - Technology and Human Resource for Industry Programme

U

UCT - University of Cape Town
 UEC - Unit for Earth Construction
 UFS - University of the Free State
 UJ - University of Johannesburg
 UK - United Kingdom
 UN - United Nations
 UNESCO - United Nations Educational, Scientific and Cultural Organisation
 UNU - United Nations University
 UP - University of Pretoria
 USA - United States of America
 USAID - United States Agency for International Development
 UWC - University of the Western Cape

W

WCAP - World Conference on Animal Production
 WITS - University of the Witwatersrand
 WRC - Water Research Commission

