Demand-led educators workgroup meeting
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The African Centre for Crop Improvement: Developing plant breeding capacity in Africa

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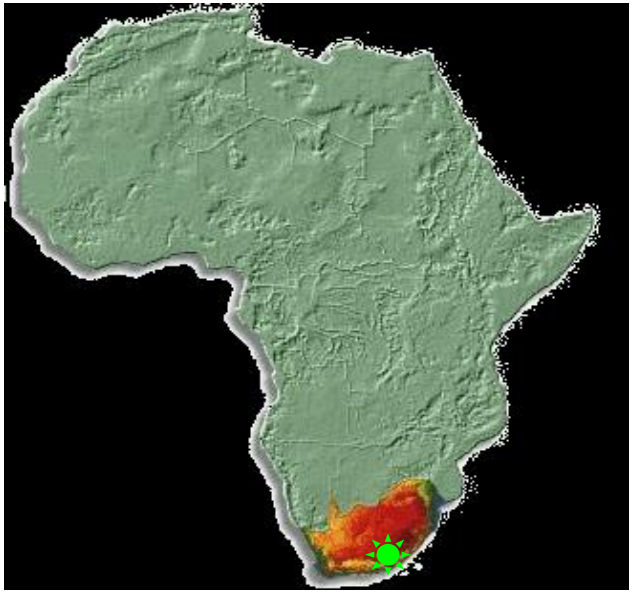
Outline

- The African Centre for Crop Improvement (ACCI)
- The nature of the ACCI PhD training
- The ACCI Curriculum

The African Centre for Crop Improvement: context

- Trains 8 PhD's per annum in plant breeding since 2002
- Students selected from 16 Southern & Eastern African countries (2 students from West Africa in Phase I)
- 56 PhDs graduated (100% retention); 39 more from Phase 2 & 3



AGRA
Growing Africa's Agriculture

THE ROCKEFELLER FOUNDATION

The nature of the ACCI training

- ✓ Coursework in SA (2 yr.) from 2013 (1 yr.)
- ✓ Research in-country (3 years) -18 food security crops

- **Develop effective selection process**
- **Prepare students thoroughly for research**
- **Writing and enabling skills and *the soft skills***
- **Create a structured degree framework**

- **A clear timetable working back from the deadline**

Unique structure in South African context

The ACCI Curriculum: list of modules and description

Review of Plant Genetics

Principles of Plant Breeding

Advanced Population and Quantitative Genetics

Biometrical Genetics

Biometry

Science communication and soft skills

Topics in Advanced Plant Breeding

Selection in Plant Breeding
Double Haploid Breeding
Mutation Breeding
Breeding for abiotic stress
Breeding for biotic stress

Participatory Plant Breeding
Biotechnology in Plant Breeding
Seed Technology and Pplant Variety Protection
Practical Plant Breeding
Thesis proposal development

The ACCI Curriculum: time table

Semester I

Month	Date	Module	Lecturer
Jan	16-18	General Orientation & Introduction of Mini-Projects & Research Proposal	PT
Jan	22-25	Review of Plant Genetics	PT
Jan	29-31	Principles of Plant Breeding	SH
Feb	1	Principles of Plant Breeding	SH
Feb	5-8	Scientific communication (Writing skills)	JS
Feb	11-15	Communication literacy workshop (Library databases & Endnote)	LP/JS
Feb	19-22	Advanced Population and Quantitative Genetics	SH
Feb	26-28	Research Proposal & Literature Review	JS
Mar	1	Research Proposal & Literature Review	JS
Mar	5-8	Review of Mating designs	PT
Mar	11-15	Software skills (MS Word & Power Point, Excel Introduction)	ND
Mar	18-20	Linkage & Recombination; Selection	PT
Mar	22	Proposals & Mini Projects	All
Mar	25-28	Tour of Breeding Programmes	All

The ACCI Curriculum

Month	Date	Module	Lecturer
Apr	2-5	Biotechnology Applications	JD
Apr	9-12	Biotechnology Applications	JD
Apr	15-19	Data Handling in Excel	KS
Apr	22-23	Graduation / Proposal (Concept Note) Presentation	All
Apr	24-26	Scientific communication (Strategies to avoid plagiarism)	JS
Apr	29	Scientific communication (Strategies to avoid plagiarism)	JS
May	2-3	Research Proposals & Mini Projects	All
May	6-10	Optimising use of GenStat & REML procedure	PN
May	14-17	Genetics Data Handling & Analysis (GenStat, SAS)	DE
May	21-24	Plant Breeding Management & Information; Breeding for Abiotic stress	DE
May	28-31	Breeding Legume crops	RM
June	3-7	Participatory Rural Appraisal	EK
June	10-14	Participatory Plant Breeding	SC
June	18-21	Data Analysis in SPSS	SH
June	24-28	Mid Year Break	All

The ACCI Curriculum

Semester II

Month	Date	Module	Lecturer
July	1-5	Breeding methods with vegetative crops	PS
July	8-12	Breeding Wheat , Teff & Irish Potato	SH
July	15-19	BMET 314/316 - Multiple Regression and Multivariate Analysis	OB
July	23-26	Breeding Rice, Sorghum, Maize, Bananas & Millets	PT
July	30-31	Breeding Rice, Sorghum, Maize, Bananas & Millets	PT
Aug	1-2	G x E Data Analysis in GenStat	JS
Aug	5-8	Research Proposals & Mini Projects	All
Aug	12-16	Breeding for disease resistance	RN
Aug	20-23	Application of Quantitative Genetics in Selection	PT
Aug	27-30	Grantmanship & project management (MS Project)	ND/JS
Sept	3-6	Seed Production Technology	RM
Sept	10-13	Seed Business Management	RM
Sept	16-20	Seed business (African Seed Company Toolbox)	AF
Sept	23	Research Proposal & Mini Projects	All
Sept	25	Issues in Breeding for Disease Resistance	ML
Sept	26-27	Non-parametric analysis of ordinal disease data	JS
Sept	30	Research Proposals & Mini Projects	All

The ACCI Curriculum

Month	Date	Module	Lecturer
Oct	1-4	Conservation & management of genetic resources	PT
Oct	7-11	Screening crops for insect resistance	KL
Oct	15	Leadership	MD
Oct	16-17	Poster development and presentation	JS
Oct	18	Research Proposal & Mini projects	All
Oct	22-25	Thesis writing/Publishing a research article	JS
Oct	29-31	Research Proposal & Mini projects	All
Nov	1		
Nov	5-8		
Nov	11-15		
Nov	18-22		
Nov	25-29	End of Year Function / Proposal Presentations/ Board meeting	

Teaching: local staff

- **Prof Mark Laing,** Director
- **Prof Rob Melis**
- **Prof Shimelis Hussein**
- **Prof John Derera**
- **Dr Julia Sibiya**
- **Dr Paul Shanahan**

Teaching: international expertise

- Cornell University – Prof Vern Gracern, Dr Stefan Einarson & Baseema (communication)
- GenStat's Scientist -Prof Roger Payne
- SAS expert -Prof George Millikens, Kansas
- Biotech by Purdue University - Prof Torbert Rocheford
- International Agriculture & its dynamics – by Prof Eugene Terry
- Agronomix Software: Dr. Dieter Mulitze (Canada)
- Resistance Breeding: Dr. Rients Nicks (Netherlands)
- PPB by Hans Smolders (Netherlands)
- PPB by S. Ceccarelli (ICRISAT)

2007 ACCI Graduates

2008 graduates

2009 graduates and staff

2010 graduates and staff

2011 graduates

2012 graduates and staff

2013 graduates

2014 graduates

ACCI – Throughput and time-to-degree

Time-to-degree = 3.12 years

72% graduated on time – 3 yrs research
12% - 1 year late: droughts, floods, slow crop

- **ACCI's throughput figures are indicative of success in PhD training and staff retention**

- **The centre is contributing to plant breeding capacity in Africa**

  - ✓**Skilful PhDs to lead programs**
  - ✓**Locally adapted and farmers-preferred germplasm**
  - ✓**Pre-breeding gains that lead to quality product through involvement of farmers & all stakeholders**

DEMAND-LED MODULE CAN BE INCORPORATED IN THE PRESENT CURRICULUM!

Thank you