Introduction

Plant Breeding Unit deals with teaching, research and outreach in Plant genetics, breeding and biotechnology. It hosts M.Sc in Plant Breeding and Biotechnology and PhD in Genetics and Plant Breeding. The Unit has developed and/or registered varieties of dry beans, snap beans, pigeon pea, sorghum and onions. Some of the research programmes include breeding for resistance to biotic and abiotic stresses in dry bean, snap bean, maize, sorghum and wheat, nutritional quality breeding in dry bean, snap bean and maize and genetic diversity of Jatropha.

Career opportunities exist in agricultural research institution, agricultural firms, environmental firms, agricultural firms, agricultural extension service, agricultural and environmental consultancy services institutions, agrochemical firms, tertiary institutions and agribusiness.

Brief history

Teaching of Genetics and Plant Breeding started in 1970 at the inception of the new Faculty of Agriculture of the University of Nairobi under the leadership of Prof V. K. Gupta. Among other pioneer lecturers in the programme were Prof. R.S. Pathak and Dr. J.F.M Onim. M.Sc. Genetics and Plant Breeding postgraduate training was senate approved and implemented in 1974. Some of the alumni of this program include Prof. Patrick Olweny Ayiecho who completed his MSc studies in 1980 and later pursued and completed his PhD studies at the University of California-Davis. He joined the Department where he rose to position of Associate Professor before becoming a parliamentarian and then Assistant Minister for Basic Education. He has since rejoined the Department to continue with teaching and research.

The Plant breeding and biotechnology program has grown considerably over the last 42 years to become one of the strongest and most productive graduate training plant breeding programs in East and Central Africa. At present, the program offers training at M.Sc and PhD levels and teaches courses to eight undergraduate degree programs in the College of Agriculture and Veterinary Sciences. It has a core team of six breeders and molecular biologists, and supported by more than 15 plant pathologists, agricultural economists, soil scientists, agronomists, food scientists, nutritionists, biometricians, horticulturalists, crop physiologists and other specialists. The graduate program offers courses in Biotechnology and Cytogenetics, Molecular Genetics and Bioinformatics, Advanced Genetics, Biometrics for Agricultural Sciences, Advanced Plant Breeding, Crop Pest Management, Biometrical Genetics, Breeding for Resistance to Biotic and Abiotic stresses, Entrepreneurship in Agriculture, Breeding East African Crops, Advanced Crop Physiology and Metabolism, Seed Science and Technology, and Research Methods and Scientific Communication. The MSc and PhD degree training is by taught course and thesis, although in exceptional cases, PhD can be pursued by thesis only.

Graduate training and research is supported by several well equipped laboratory and field infrastructure which include a well equipped molecular breeding laboratory; plant pathology laboratory with specialised facilities for mycology, nematology, bacteriology and virology; genetics, crop botany and plant physiology laboratories; food chemistry and microbiology; pilot food processing plant, computer and biometry laboratories, soil fertility, soil physics and soil chemistry laboratories, and a reliable ICT network for staff and students. A new seed processing plant, seed pathology, seed storage and seed quality laboratories are at an advanced stage of
construction and will be commissioned soon. Staff and student research is conducted in Kabete Field Station which is campus and within Nairobi County, and several out-stations countrywide and in research sites of collaborating National Agricultural Research Systems (NARS) in eastern Africa. The program has attracted many international students and visiting scientists from east, central, south and west Africa, and other countries. It has strong collaboration with several universities, institutes of advanced research, consultative group of international agricultural research (CGIAR), private food processing and seed companies, regional research networks including BioResources Innovations for Eastern Africa Development (Bio-innovate), Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA), RUFORUM (Regional Universities Forum for Capacity Building in Agriculture), a network of 29 African Universities and Kilimo Trust.

The program has had a remarkable research output with more than 500 scientific publications and 30 new crop varieties. Academic staff and students have conducted research and published papers in crop improvement, genetics and seed science research on cowpeas, amaranthus, pigeonpea, potato, onions, maize, forages, common bean, millet, sorghum, dry bean, coffee, pyrethrum, garden peas, snap beans, runner beans, wheat, barley and rice among others. Some of the current research themes include drought resistance, participatory breeding, marker assisted breeding for multiple disease resistance, biofortification, canning beans for processing industry, breeding bush and climbing snap bean for domestic and export markets, short day grain and vegetable runner beans.

### Unit Head

Prof. P. M. Kimani received both an M. Sc. in Agronomy and PhD in Genetics and Plant Breeding from the University of Wisconsin-Madison in a record three and half years in July 1983. He has extensive research and teaching experience in genetics and plant breeding, agronomy, seed science and technology which he has taught to both undergraduate and graduate students in the last 29 years. His major interests include teaching, variety development, agronomy of both field and horticultural crops and technology transfer among smallholder farmers. [Read more](#)

### Staff

Kiarie Njoroge holds a PhD in Plant Physiology and Breeding from
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<th>Name</th>
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<tr>
<td>Dr. Kiarie Njoroge</td>
<td>PhD(MSc,BSc)</td>
<td>Cambridge University (England), an MSc in Agricultural Botany from University of Wales (UK) and a BSc (biological sciences) from University of Nairobi (Kenya). He has held various positions including Senior at the University of Nairobi, Deputy Centre Manager and Principal Research Officer at the Kenya Agricultural Research Institute. <a href="#">Read more</a></td>
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<tr>
<td>Dr. Eliud Kahi Ngugu</td>
<td>PhD(MSc,BSc)</td>
<td>Dr. Ngugi is a holder of PhD in Plant breeding &amp; Genetics; an MPhil in Plant breeding &amp; Genetics, MSc in Plant breeding and Genetics and B.Sc. He is a former member of Cambridge Philosophical Society, The New York Academy of Sciences. He has been included in Who’s Who In the World 1999 Editions. He is currently working as a Senior Lecturer, University of Nairobi and also undertaking part-time consultancy. He has taught for 9 years at the University of Nairobi as a Senior Lecturer. He teaches the following courses at the university, molecular genetics, plant breeding and biotechnology. He is currently supervising 3 PhD and 8 Msc research projects. His core areas of competence include; Breeding crops for drought tolerance using DNA molecular markers (RFLPs, Microsatellites, AFLP, SSRs), QTL analysis, Molecular mapping, DNA Sequencing, fragment analysis and Genotyping. He has worked with Kenya Agricultural Research Institute (KARI) as a plant breeder of grain legumes and underutilized crops for 14 years and together with a team developed 14</td>
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varieties of common bean, cowpea, pigeonpea, mungbean, Dolichos lablab that are currently under commercial cultivation in semi-arid areas of Kenya.

**Areas of specialization**

- Plant genetics, Plant breeding, Plant molecular genetics, Plant biotechnology

**Research areas**

1. Citrus tissue culture and biotechnology.
2. Application of molecular markers and techniques in plant science.
5. Fitness studies

**Read more**

Felister Mbute Nzuve is a Plant Breeder and Biotechnologist who teaches the undergraduate students on the aspects of plant breeding, molecular genetics and biotechnology at the Department of Plant Science and Crop Protection, University of Nairobi. She is currently completing her PhD studies in Plant Breeding and Biotechnology at Makerere University, Uganda. Her research focuses on breeding for resistance to stem rust in bread wheat with the ultimate goal to contribute towards high wheat...
### Degrees

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<td>MSc Horticulture</td>
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<td>BSc Agriculture</td>
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### Projects

- Value Added Bean Technologies For Enhancing Food Security, Nutrition, Income And Resilience To Cope With Climate Change And Variability Challenges In Eastern Africa.
List of alumni of MSc Plant Breeding (1979-1995)

1979

IQBAL R. KERMALI
GLYNN GEORGE MADUMADU
FRANCIS MUSAU NDAMBUKI
ROMULUS M. OPONDO

1981

MARY NAMAROME WABULE

1982

AARON R. TUIKONG

1980

PATRICK OLWENY AYIECHO
DEBORAH NAMUBIRU MULINDWA
DAVID KIEMA MUTHOKA

1983

PAUL M.K. KIRERU

1988

C.O. AGWANDA
GITHIRI S. MWANGI
JANE IVARA
ANANIA W. KIARIE
RUTH NABUKENYA

1989
STEPHEN GAYA AGONG
PHILIP OBARA OKEYO
JOHN NG’ANG’A WAMATU

1985
HUBERT ANTHONY D’SOUZA
SAMUEL GUDU

1986
SILAS DANIEL OBUKOSIA

1990
JOHN NDUNG’U NJENGA

1994
THOMAS MWAMBURI MCHARO
WINFRED ACHIENG ODENYO

1995
MOSES TAMBA MOSERAY