



**UNIVERSITY OF NAIROBI**  
***DEPARTMENT OF PLANT SCIENCE AND CROP PROTECTION***

**ANNUAL REPORT**  
**2012/2013**

**OFFICE OF THE**  
**CHAIRMAN**

## **ACKNOWLEDGEMENT**

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We also acknowledge the support of Prof. Agnes Mwang'ombe, Principal, College of Agriculture and Veterinary Sciences, the Dean, Faculty of Agriculture, Heads of sections and Units, and all academic staff in the Department for providing the required information.

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**CHAIRMAN, SECTION HEADS, UNIT HEADS AND CHIEF TECHNOLOGIST**



**Prof. George N. Chemining'wa**  
Chairman, Department of Plant Science and Crop Protection



**Prof. Margaret J. Hutchinson,**  
Crop Science Section Head



**Prof. James W. Muthomi**  
Crop Protection Section Head



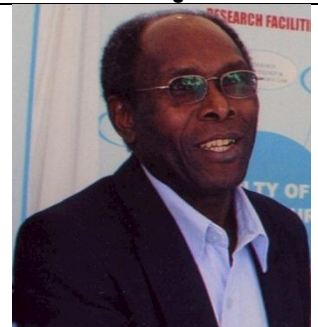
**Prof. Paul M. Kimani**  
Plant Breeding Unit Head



**Mrs. Parin Kurji,**  
Biometry Unit Head



**Prof. Florence M. Olubayo**  
Entomology Unit Head



**Dr. Josiah M. Kinama**  
Agronomy Unit Head



**Dr. Jane Ambuko**  
Horticulture Unit Head



**Dr. William M. Muiru**  
Plant Pathology Unit Head



**Mr. Joel Aura**  
Chief Technologist

## MESSAGE FROM THE CHAIRMAN



**Prof. G.N. Chemining'wa**  
**Chairman of the Department**

The Department holds a premier position in the region in the provision of quality teaching, research, outreach and consultancy services because of high quality and committed staff, adequate facilities and an established culture of high performance. We undertake rigorous training at both undergraduate and postgraduate levels. The department has in the recent past introduced Open, Distance and e-Learning (ODL) to cater for students whose work engagement may not allow them to be away from the workstation for prolonged periods. The ODL mode of delivery was initially piloted in 2010 with M.Sc. Crop Protection and has now become the mode of choice for most prospective students. The programme has now been expanded to include M.Sc. Horticulture, M.Sc. Agronomy, and M.Sc. Agricultural Resource Management. As a result, the number of postgraduate students has increased significantly. The Department has over 20 PhD students enrolled in its various academic programmes. Postgraduate students are drawn from the East

African Community, Southern Africa and even North America, making our programmes truly international.

The Department has continued to remain competitive in research and development both locally and globally. It has strong linkages with national, regional and international research and education institutions. Most academic staff members are very active in seeking funds externally from donors by writing winning proposals. Researchers in the Department have developed new bean varieties that are rich in iron and zinc compared to ordinary bean varieties, as a strategy to deal with micronutrient malnutrition or hidden hunger. Research and development projects in cassava, banana, sorghum, maize, grain legumes, indigenous vegetables, mango, passion fruit, millet and snap bean have also been implemented jointly with stakeholders. It is worth noting that the Department has been a leader in the University in terms of protecting and commercializing its intellectual assets. To protect its intellectual property rights, the Department has developed partnerships with local seed companies to deliver the bean seed to the ultimate end users, the farmers.

The Department also undertakes consultancies and advisory services. It has carried out efficacy trials of agricultural chemical molecules for over 10 chemical companies in the country. These trials provide opportunities for internship for our recently graduated B.Sc. agriculture and horticulture students. The Department also carries out disease and pest diagnostics and assists farmers and other stakeholders to establish crop enterprises, particularly in the horticultural sector.

The Department hosts a centre of excellence in seed technology and business known as SEMIS – Seed Enterprise Management Institute. With its partners, it has offered and continues to offer short term courses in seed technology and business related areas for managers of seed companies in Sub-Saharan Africa with support from the Alliance of a Green Revolution in Africa (AGRA). The Institute has established a modern seed processing factory next to the Departmental office at the Field Station. This facility will be a key in training postgraduate students in seed processing.

Members of the Department are actively engaged in implementation of outreach activities among communities and organizations. In fact, almost every research project has an outreach component in which the researchers disseminate innovations to farmers and build capacities of different stakeholders. This is important for improving the uptake and adoption of research outputs. Many members of staff attend and present papers at high profile workshops and conferences organized at national, regional and global levels. The Department actively participates in national and regional research and educational exhibitions. Some of our academic staff and students have won awards in scientific forums held locally and globally. Besides, a number of our academic staff members have played major roles as members of boards, councils and committees of national, regional and global bodies.

The environment in which the Department operates is very dynamic. Consequently, the Department is confronted by new challenges and exposed to new opportunities. To overcome the challenges and exploit the opportunities, it has developed a strategic plan that will guide it in the next five years (2013 – 2018) towards achievement of its vision of a leading and vibrant centre of excellence for training, research, consultancy and outreach in Crop Sciences and Environmental Conservation. The department continues to build on its strengths in crop pest diagnostics, integrated pest management, plant breeding and quality seed development, biotechnology, crop management and cropping systems, postharvest technology, biometrics, consultancy and outreach to improve its institutional competitiveness and image.

## INTRODUCTION

The Department of Plant Science and Crop Protection is one of the oldest Departments in the University of Nairobi and originally started as two departments, Department of Crop Production and Department of Applied Science in the Faculty of Agriculture in 1970/71 within the College of Agriculture and Veterinary Sciences (CAVS) in the Upper Kabete Campus. The two departments were later re-organized and merged and renamed the Department of Crop Science. In 1997, the Department of Crop Science was split into two departments namely, Department of Crop Science and Department of Crop

Protection. In 2005, the two departments were merged to form the Department of Plant Science and Crop Protection. After the merger, the department was re-organized into two sections; namely Crop Science and Crop Protection.

The Crop Science Section is made up of the following units: Agronomy, Horticulture, Plant Breeding and Biometry. The Crop Protection Section has two units, Plant Pathology and Entomology Units. The Department teaches most of the courses for the BSc Agriculture Programme offered by the Faculty of Agriculture. It offers a BSc course in Horticulture, Diploma in Crop Protection, a certificate course in Floriculture and services 51 courses for different departments in the College of Agriculture and Veterinary Sciences (CAVS). The Department offers masters and PhD programmes in Agronomy, Plant Breeding, Plant Pathology, Crop Protection, Horticulture and Agricultural Resource Management.

The Department undertakes rigorous training for both Undergraduate and Postgraduate levels and conducts research geared towards solving national and international problems. The Department also undertakes consultancies, advisory services and encourages both national and international collaboration. The Department has strong linkages with national, regional and international research institutions and universities. The department has qualified staff and thus able to deliver quality training and research in all areas of its mandate.

Majority of the pioneer senior academic staff of the Department were expatriates from The Netherlands, Britain, Newzealand and India. The senior-most Kenyan academic staff member then was Prof. D.N. Ngugi who was also the first indigenous Kenyan Chairman of the Department. The Department has had nine substantive Chairmen. These are Prof. C.L. Van Eijnatten (1971-1977), Prof. D.N. Ngugi (1977-1985), Prof. D.M. Mukunya(1985-1988), Prof. R.W. Michieka, (1988-1989), Prof. K. Waitthaka (1989-1993), Prof. J.W. Chweya (1994-1999), Prof. E.W. Mutitu (1997-2003), Prof. L.S.M Akundabweni (1999-2005), Prof. F.M. Olubay (2003-2011) and Prof. G.N. Chemining'wa (2011 to- date). Prof. Mutitu was the pioneer Chairman of the former Department of Crop Protection before the merger with the former Department of Crop Science to form Department of Plant Science and Crop Protection. Prof. F.M. Olubayo served as the second and last Chairman of the former Crop Protection Department for two years and then six years as the Chairman of the Department of Plant Science and Crop Protection.

## **VISION, MISSION, CORE VALUES AND OBJECTIVES OF DEPARTMENT**

### ***Vision***

A leading and vibrant centre of excellence for training, research, consultancy and outreach in crop sciences and environmental Conservation

### ***Mission***

To provide a conducive learning environment for quality education and training that promotes scholarship, stimulates innovative research and technology development, consultancy and community service for improved livelihoods and sustainable development.

### ***Core Values***

To realize its Vision and Mission, the Department shall operate within certain shared societal virtues and moral standards. The following core values shall guide the Department:

- Good governance
- Innovativeness and creativity
- Team spirit and teamwork
- Professionalism and integrity
- Quality customer service
- Transparency and accountability
- Environmental conservation
- Freedom of thought and expression
- National cohesion and inclusiveness.

### ***Strategic objectives***

The strategic objectives of the Department are:

1. To manage the Department efficiently
2. To grow the Department resource base and enhance productivity
3. To produce quality and holistic graduates in crop science, crop protection and environmental sciences

4. To contribute to the development of society through creation, storage, application and dissemination of knowledge in crop science, crop protection and environmental sciences
5. To enhance strategic partnerships and collaborations
6. To enhance the competitiveness of CAVS as a centre of excellence in agricultural, veterinary and environmental sciences

## **GOVERNANCE**

The Chairman is the academic and Administrative head of the Department and chairs the Department Board. There are two section heads: one for Crop Science section and the other for Crop Protection section. Crop Science section has four Unit Heads in charge of Agronomy, Biometry, Horticulture and Plant Breeding Units, respectively, while the Crop Protection Section has two Unit heads in charge of Entomology and Plant Pathology, respectively. The Department conducts its business according to the University of Nairobi policies and practices.

## **UNITS OF THE DEPARTMENT**

### **Crop Science Section**

#### **Plant Breeding and Biotechnology Unit**

The Plant Breeding and Biotechnology program is one of the oldest and well established post-graduate plant breeding training programs in Kenya and eastern Africa. It was established in 1970 at the inception of the new Faculty of Agriculture



Prof. P.M. Kimani, Unit Head

of the University of Nairobi under the leadership of Prof V. K. Gupta. The 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 and published crop improvement, genetics and seed science research on cowpeas, amarathus, 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.



## Agronomy Unit



Dr. J. Kinama, Unit Head

Agronomy has been taught in the University of Nairobi since 1970 when the Faculty of Agriculture started the B.Sc. Agriculture programme. The pioneer lecturers included Prof. Van Eijnatten, Prof. A.M.Gurnah, Prof. N.M. Fisher and Prof. D.N. Ngugi. The second to third cohort of Lecturers included Prof. D.S.O Osiru, Prof. J.O. Nyabundi, Prof. Basiime and Prof. L.S.M. Akundabweni. M.Sc. Agronomy is one of the pioneer postgraduate programmes in the Department of Plant Science and Crop Protection. The curriculum for this programme was developed and approved by the University of Nairobi Senate in 1974. M.Sc. Agronomy graduated its pioneer students in 1977.

Among the early graduates of this programme are Prof. J.O. Nyabundi, former Managing Director of Chemelil Sugar Company and current Principal (Murang'a University College), who completed in 1980. Prof. Solomon Shibairo (Deputy Principal, Kibabii University College) and Prof. G.N. Chemining'wa, the current Chairman of the Department of Plant Science and Crop Protection, are among the graduates of the M.Sc. Agronomy programme. The M.Sc. Agronomy used to train students specializing in horticulture till the late 1980s when M.Sc. Horticulture programme was introduced in the Department. It also produced the pioneer weed science specialists in Kenya till 1995 when the weed science discipline was moved to the former Crop Protection Department. The MSc Agronomy programme has a strong environmental agronomy component with courses such as remote sensing, agroecosystem analysis, forage science, agrometeorology and climate change on offer. The Agronomy Unit has also trained many PhD students who are offering expertise and valuable service in the public and private sector locally, regionally and globally.

The Unit ran donor funded projects in snap bean integrated crop management, maize-cowpea productivity enhancement, conservation and characterization of premium value of indigenous plant biodiversity and products on small-holder farming systems, genetic diversity and nodulation efficiency of legumes and improving dry bean productivity through drought resilient varieties. Other agronomy projects have included enhancing millet, cassava, sugarcane, coffee and potato productivity through improved varieties and resource use efficiency. These projects have had outreach components through field days, farmer field schools and participatory technology selection approaches.

## Horticulture Unit



Dr. J. L. Ambuko, Unit Head

Horticulture as a discipline has been part of B.Sc. programme in the Faculty of Agriculture since its inception in 1970. One of the pioneer lecturers who taught the horticulture courses was Prof. Kimani Waithaka who later became the Chairman of the then Department of Crop Science and subsequently the Dean of the Faculty of Agriculture. Prof. Waithaka was a pioneer biotechnology specialist in Kenya who trained the first cohort of tissue culture specialists in the country who later scaled up and out TC technology in Kenya and the region. Until the late 1980s post-graduate training in horticulture was carried out under the M.Sc. Agronomy program which was approved by

senate and implemented in 1974. In 1988, M.Sc. Horticulture program was initiated and has since trained key personnel for the Ministry of Agriculture, Universities, research institutions, public regulatory organizations and the private sector. The M.Sc. Horticulture program in the Department of Plant Science and Crop Protection is offered in full time and part time mode.

Horticulture Unit deals with teaching, research and outreach in pre-harvest, harvest and post harvest management of vegetable, fruit and ornamental crops, landscape management and horticultural crop physiology. The Unit hosts B.Sc. Horticulture, M.Sc. Horticulture and PhD Horticulture. It offers consultancy services in horticultural crops establishment and management. Some of the research conducted in the unit includes: postharvest physiology and technology of indigenous vegetables, mango, avocado, passion fruits and cut flowers, potato management; diversity/management of Cleome, cowpea and tomato; greenhouse production.

## Biometry Unit



Mrs. Parin Kurji, Unit Head

Biometry, statistics and mathematics have been taught in the Faculty of Agriculture since the inception of the Faculty of Agriculture degree programs in 1970. Mrs. Parin Kurji was a pioneer Lecturer who taught biometry, statistics and mathematics courses in various undergraduate and postgraduate programs in the Department of Plant Science and Crop Protection (formerly Department of Crop Science) and Faculty of Agriculture. She started teaching after attaining her Master of Science (Statistics) from the College of Biological and Physical Sciences, University of Nairobi, in 1971. Dr. Wilson K Sitonik and Dr. Jan Pit later provided further support in teaching Biometry, statistics and mathematics

courses in the Department and Faculty. After the departure of Drs. Wilson Sitonik and Jan Pit, the Department recruited three new more staff members to teach courses dealing with biometry, statistics and mathematics.

Biometry Unit deals with Statistics, Mathematics and Biometry. It plays a critical role in the development of sound and effective agricultural research practice in the mother Department and Faculty of Agriculture at large. It services all Undergraduate and postgraduate programmes in mathematics, Statistics and biometry in the Faculty of Agriculture. It also offers research support and consultancy services in experimental designs, data collection, data analysis and participatory research.

## Entomology Unit



Prof. F. Olubayo, Unit Head

Entomology as a subject has been taught in the Faculty of Agriculture since 1970 when the B.Sc. Agriculture program started. This course was originally taught by lecturers from the School of Biological Sciences at Chiromo Campus as the Faculty of Agriculture had no resident Entomology lecturers of its own. The pioneer Lecturers who taught entomology courses were celebrated scholars led by Prof. Thomas Odhiambo and Prof. Khamala. In the late 1970s Agricultural Entomology Unit under the leadership of the two aforementioned professors was moved to the Faculty of Agriculture but the move was short-lived as they soon after went back to the School of Biological Sciences at Chiromo Campus. For most of the 1980s Entomology courses were taught by Prof. Gideon Nyamasio from the School of Biological Sciences.

In recognition of the need to build own capacity in the entomology discipline, the Department of Plant Science and Crop Protection (formerly Department of Crop Science) recruited its first Agricultural Entomologist, Prof. Florence M. Olubayo, from the National Agricultural Research Laboratories (NARL), Nairobi, in December 1988. Prof. Olubayo taught Entomology courses with Prof. Nyamasio till 1992 when Prof. John H. Nderitu who was also then working at the National Agricultural Research Laboratories (NARL). After the review of the B.Sc. Agriculture in 2003 and introduction of new programmes such as B.Sc. Agricultural Education and Extension, more entomology courses were introduced and the need for more entomology lecturers increased. Two more academic staff were later recruited to ensure that the Department cope with teaching load. There was also recruitment of technologists in 1990 and 2003 to provide back-up to the lecturers particularly in handling practicals.

Postgraduate training in Agricultural Entomology was only carried out at the School of Biological Sciences which offered M.Sc. in Agricultural Entomology. Graduates of our B.Sc. Agriculture programmes used to enroll in this programme. Prof. Olubayo, for example, is a graduate of the M.Sc. Agricultural Entomology Programme. In 1997, the Department of Crop Protection was hived off the Department of Crop Science and this heralded spectacular improvements in postgraduate training in entomology in the Department. The Department of Crop Protection created M.Sc. Crop Protection in which Agricultural entomology was created as an area of specialization. Entomology specialization has become very popular with students and therefore the Department has trained many specialists in agricultural entomology. Dr. Dora Kilalo and Dr. Faith Toroitich who are Agricultural Entomology lecturers in the Department were among the pioneer graduates who specialized in agricultural entomology while taking M.Sc. Crop Protection.



## PLANT PAHOLOGY UNIT



Dr. Maina Muiru, Unit Head

Plant Pathology as a subject has been taught since the start of BSc Agriculture Degree program in 1970. The pioneers who taught the various courses in this thematic areas included Prof. D. M. Mukunya, Prof. E. Gathuru and Dr. P. Sigh. They were supported by visiting Lecturers to be able to deliver the various courses. In particular, Nematology course was taught for many years by visiting Professor from Nigeria.

Later, these visionary pioneers initiated an MSc in Plant Pathology which was later senate approved and launched in 1977. The aim was to train personnel for the Ministry of agriculture and other associated Institutions. Thus, the pioneer students were drawn from the Ministry of Agriculture and a few limited chances were available to students from neighboring countries. It was at this time that a fresh graduate of 1977 graduating class was admitted into this program but under staff development. This student was Dr.

Robin Buruchara who was further retained and sponsored for PhD. He undertook his PhD research work in CIAT, Cali, Colombia but graduated from University of Nairobi as the first PhD graduate in Plant Pathology in UoN. He later resigned and joined CIAT and is currently the CIAT Regional Director in Africa. Prof. E. Mutitu, Director BPS was also a pioneer MSc Plant Pathology student in the class of 1977.

MSc Plant Pathology course was mounted on a two year interval. Thus, the second group of students in this degree program were admitted in 1979. Prof. A. W. Mwang'ombe, Principal, CAVS was amongst the students admitted in this program in 1979. She proceeded for her PhD in Plant Pathology in 1984 in Imperial College of Science, Technology and Medicine, University of London under the Commonwealth Scholarship program. She joined this Department in February 1988 after attaining her PhD.

Weed science has been taught in the Department of Plant Science and Crop protection since the inception of B.Sc. Agriculture in 1970. The pioneer lecturers who taught weed science courses to undergraduate and Masters students included Prof. Ratemo W. Michieka who later became Chairman of the Department, first Vice-Chancellor of Jomo Kenyatta University of Agriculture and Technology (JKUAT) and founding Director General of the National Environmental Management Authority (NEMA). Dr. Safari Ariga joined the Department in 1988 as lecturer in weed science and has continued to provide this service over the years. The weed science thematic area has received a lot of support from leading weed scientists from the Kenya Agricultural Research Institute who have taught part-time and co-supervised postgraduate students.

Postgraduate training in weed science was offered under the M.Sc. and PhD Agronomy programs for over 20 years since the inception of the Faculty of Agriculture in 1970. A weed science course was taught to all agronomy students and students who were inclined towards weed science thesis research in this area. Prof. Safari Ariga who is a senior lecturer in the Department of Plant Science and Crop Protection is among weed science specialists who earned M.Sc. in Agronomy from the University of Nairobi. Academic staff in weed science thematic area were moved to Crop Protection Department following the split of the former Department of Crop Science into Crop Protection and Crop Science. Eventually, weed science thematic was fully integrated in M.Sc. Crop Protection which now produces weed science specialists.

Plant Pathology Unit aims to protect plants against bacteria, fungi, viruses and nematodes, thereby enhancing plant health and productivity. The Unit offers M.Sc. Plant Pathology and plays a critical role in MSc Crop Protection. Members of the Unit are active researchers. Some of the research conducted in the Unit include: management of cereal mycotoxins, viruses in root crops, nematodes in horticultural crops and molecular disease diagnostics. The Unit offers consultancy services in Disease diagnostics.

**PHOTOS OF STAFF PARTICIPATING IN SELECTED ACTIVITIES**



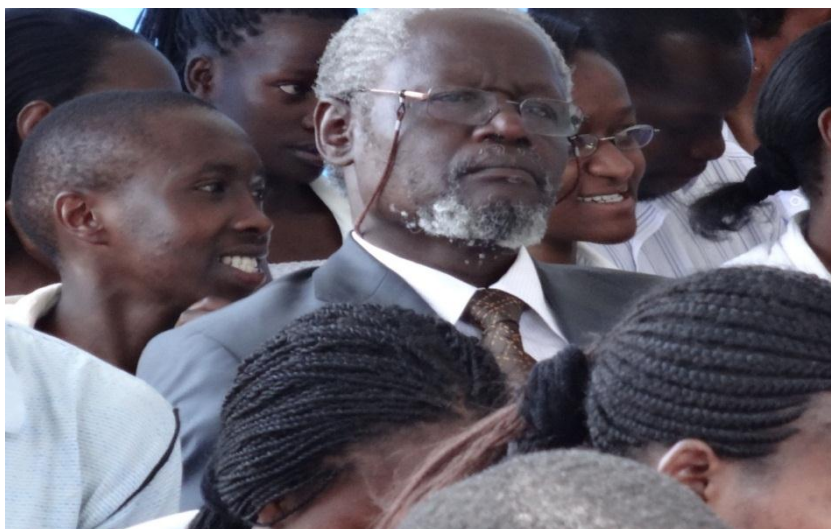
Photo during hands on training of technical staff on RT PCR in our Molecular Genetics Laboratory



Members of department celebrating retired colleagues at the Faculty Club-Kabete



Prof. R. Michieka planting a tree during RRI activities on Constitution of Kenya (2010) at the Field Station



Prof. P.O. Ayiecho (in a suit) among students listening keenly to a speech by Mr. Charles Nyachae (CIC-Chairman) on Constitution of Kenya 2010 held at the Field Station in 2013, as part of the RRI activities.



Staff and M.Sc. students at the launch of ODL M.Sc. Agricultural Resource Management (2013)

#### POST-GRADUATE AND DIPLOMA PROGRAMS IN THE DEPARTMENT

|     | <b>PROGRAM</b>                       | <b>Number of students Registered in 2012/2013</b> | <b>Number of students who graduated in 2012/2013</b> |
|-----|--------------------------------------|---|--|
| 1.  | MSc Crop Protection                  | 25  | 6  |
| 2.  | MSc Horticulture                     | 6   | 2  |
| 3.  | MSc Agronomy                         | 4   | 5  |
| 4.  | MSc Plant Breeding & Biotechnology   | 3   | 4  |
| 5.  | MSc Agricultural Resource Management | 6   | 1  |
| 6.  | MSc Plant Pathology                  | -   | 1  |
| 7.  | PhD Crop Protection                  | 6   | 3  |
| 8.  | PhD Horticulture                     | 1   | -  |
| 9.  | PhD Agronomy                         | 3   | -  |
| 10. | PhD Genetics and Plant Breeding      | 3   | 1  |
| 11. | Diploma in Crop Protection           | 15  | 10   |
|     | <b>Total</b>                         | <b>72</b>   | <b>33</b>  |

## STUDENTS ADMISSION

Admission criteria for the M.Sc. and Diploma programmes are specified in the senate approved curricula. There is an upward trend in admission for MSc, Diploma and PhD programmes.

### Diploma in Crop Protection admission requirements

- 1) Holders of KCSE with mean grade of C plain and at least C- pass in any of the following subjects: biology, chemistry, agriculture or physics.
- 2) Holders of KCE with division II and at least a pass in biology or chemistry, or physics or agriculture, or physical science or mathematics.
- 3) Holders of KACE with at least one Principal level pass and at least subsidiary pass in biology or chemistry or physics or mathematics.
- 4) Holders of certificate in Crop Protection, Agriculture, Horticulture, Forestry, Environmental Science or related Plant or Biological Sciences
- 5) Holders of Diploma, Higher diploma or degree in any natural or biological sciences

### M.Sc. Programmes

- 1) Holder of Bachelor of Science degree with at least Upper Second class Honours in Agriculture, Botany and Zoology, Environmental Sciences, Forestry, Horticulture or related plant sciences or Bachelor of Education with botany and Zoology option and any other subject from University of Nairobi or any other institutions recognized by Senate
- 2) Holder of degree with at least Lower Second Class Honours in any of the degrees specified in (i) with 2 years of relevant experience or postgraduate Diploma in (i) from the University of Nairobi or any other institution recognized by Senate
- 3) Holder of pass degree with postgraduate diploma in the above relevant disciplines or its equivalent from the University of Nairobi or any other equivalent institution recognized by Senate

Contact details: Chairman, Department of Plant Science and Crop Protection, P.O. Box 29053-00625, Nairobi. Phone: +254202055129

## STAFF IN THE DEPARTMENT

### Academic staff

|    | NAME                         | DESIGNATION                 |
|----|------------------------------|-----------------------------|
| 1. | Mukunya, M. Daniel, Prof.    | Professor                   |
| 2  | Michieka W. Ratemo, Prof.    | Professor                   |
| 3  | Kimani-Waithaka, Prof.       | Professor                   |
| 4  | Mwang'ombe W. Agnes, Prof.   | Professor (Principal)       |
| 5  | Kimani .M. Paul, Prof.       | Professor                   |
| 6  | Mutitu.W. Eunice, Prof.      | Professor (Director, BPS)   |
| 7  | Chemining'wa N. George Prof. | Assoc. Professor (Chairman) |
| 8  | Akundabweni S.M. Levi, Prof. | Assoc. Professor            |
| 9  | Ayiecho, O. Patrick, Prof.   | Assoc. Professor            |
| 10 | Shibairo. I. Solomon, Prof.  | Assoc. Professor            |
| 11 | Nderitu H. John, Prof.       | Assoc. Professor            |
| 12 | Olubayo M. Florence, Prof.   | Assoc. Professor            |
| 13 | Kimenju W. John, Prof.       | Assoc. Professor            |
| 14 | Muthomi W. James, Prof.      | Assoc. Professor            |
| 15 | Hutchinson J. Margaret Prof. | Assoc. Professor            |
| 16 | Ariga .S. Emmanuel, Prof.    | Assoc. Professor            |
| 17 | Narla D. Rama Prof.          | Assoc. Professor            |
| 18 | Njoroge Kiarie, Prof.        | Assoc. Professor            |
| 19 | Nyankanga O. Richard Dr.     | Senior Lecturer             |
| 20 | Ngugi K. Eluid Dr.           | Senior Lecturer             |
| 21 | Kinama M. Josiah Dr.         | Senior Lecturer             |
| 22 | Kurji Purin Mrs              | Lecturer                    |



|    |                        |                 |
|----|------------------------|-----------------|
| 23 | Obudho Elias Mr        | Lecturer        |
| 24 | Mongare O. Peter Mr    | Lecturer        |
| 25 | Muiru M. William Dr.   | Lecturer        |
| 26 | Onyango M. Cecilia Dr. | Lecturer        |
| 27 | Ambuko L. Jane, Dr.    | Lecturer        |
| 28 | Miano W. Douglas Dr.   | Lecturer        |
| 29 | Kilalo C. Dora Dr.     | Lecturer        |
| 30 | Toroitich J. Faith Dr. | Tutorial Fellow |
| 31 | Magomere Titus         | Tutorial Fellow |
| 32 | Nzuve M. Felister Mrs  | Tutorial Fellow |
| 33 | Musembi N. Nicodemus   | Tutorial Fellow |
| 34 | Kitonyo M. Onesmus     | Tutorial Fellow |

**Non-Academic Staff**

|    |                         |                                  |
|----|-------------------------|----------------------------------|
| 35 | Aura A. Joel            | Chief Technologist               |
| 36 | Njuguna K. Samuel       | Senior Technologist DEF          |
| 37 | Kariuki K. Samuel       | Senior Technologist DEF          |
| 38 | Angwenyi M. Michael     | Senior Technologist DEF          |
| 39 | Muchira W. Sicily       | Senior Technologist DEF          |
| 40 | Ontweka N. Lameck       | Senior Technologist DEF          |
| 41 | Chebii K. Willy         | Senior Technologist DEF          |
| 42 | Wagura K. Joseph        | Senior Technologist DEF          |
| 43 | Khamila W. Douglas      | Senior Technologist DEF          |
| 44 | Peter M. Catherine      | Technologist ABC                 |
| 45 | Nyaga W. Sicily         | Technologist ABC                 |
| 46 | Mwagangi N. Titus       | Technologist ABC                 |
| 47 | Ndegwa W. Mary          | Technologist ABC                 |
| 48 | Mvungu M. Nancy         | Technologist ABC                 |
| 49 | Kimani W. Rachael       | Technologist ABC                 |
| 50 | Thiongo W. Esther       | Secretary B                      |
| 51 | Gichuru M. Charity      | Secretary B                      |
| 52 | Mugo K. Ephantus        | Driver Grade IV                  |
| 53 | Mathenge N. Dickson     | Assistant Technologist Grade IV  |
| 54 | Ochola M. Christine     | Assistant Technologist Grade IIV |
| 55 | Gathoni N. Risper       | Assistant Technologist Grade IV  |
| 56 | Muthiora K. Simon       | Assistant Technologist Grade III |
| 57 | Mucheni N. Margaret     | Contract (Grade I)               |
| 58 | Gichia W. Mary          | Contract (Grade I)               |
| 59 | Okello A. Mary.         | Contract (Grade I)               |
| 60 | Ndungu K. David         | Project Manager-SEMIs            |
| 61 | Techtuk C. Rosbena      | Technologist ABC                 |
| 62 | Mwazemba K. Florence K. | Office Assistant                 |
| 63 | Maina G. Francis        | Cleaner                          |
| 64 | David M. Ndungu         | Driver/Research Assistant        |
| 65 | Esther M. Mutungu       | Research Assistant               |

**RECRUITMENTS, PROMOTIONS AND LEAVES**

**Recruitment**

1. Onesmus Musembi Kitonyo- Tutorial Fellow in Agronomy

**Promotions to Associate Professor**

1. Prof. M. J. Hutchinson- Horticulture
2. Prof. R.D. Narla- Plant Pathology

3. Prof. J.W. Muthomi- Plant Pathology
4. Prof. K. Njoroge- Plant Breeding
5. Prof. E. S. Ariga- Weed Science
6. Prof. G.N. Chemining'wa- Agronomy

#### **Promotion from Tutorial Fellow to Lecturer**

1. Dr. Dola Kilalo

#### **Study Leave:**

1. Onesmus Musembi Kitonyo (Tutorial Fellow, Agronomy)- PhD student at University of Adelaide, Australia
2. William Chebii (Senior Technologist, Agronomy)- M.Sc. student at Vrije Universiteit, Brussels, Belgium

#### **Leave of Absence:**

1. Prof. Solomon Shibairo- Serving at Kibabii University College as Deputy Principal (Academic and Research)
2. Prof. Levi Akundabweni- Serving as Professor at the University of Namibia

### **OUTREACH AND COMMUNITY SERVICE**

1. Chemining'wa, G. N., External examination at Chepkoilel University College, 3<sup>rd</sup> to 8<sup>th</sup> August 2012.
2. Muthomi, J. W., External examination at Chepkoilel University College, 3<sup>rd</sup> to 8<sup>th</sup> August 2012.
3. Shibairo, S. I. External examination at Maseno University, 12<sup>th</sup> to 18<sup>th</sup> August 2012.
4. Muthomi, J. W. External examination at Masinde Muliro University of Science and Technology, 2011 to date
5. Muthomi, J. W. External examination of postgraduate theses at University of Eldoret, 2013
6. Muthomi, J. W. External examination of postgraduate theses at Jomo Kenyatta University of Agriculture & Technology, 2012
7. Muthomi, J. W. External examination of postgraduate theses at Egerton University, 2012
8. Muthomi, J. W. External examination of postgraduate theses at Kenyatta University, 2012
9. Agricultural Sector Development Forum – Exhibition at Safari Park Hotel, 14<sup>th</sup> –17<sup>th</sup> October 2012.(Dr. J. Kinama and Mr. D. Karanja)
10. Tree planting in Kibwezi Field Station – Approximately 2000 trees planted on 23<sup>rd</sup> November 2012. Will Chebii and Michael Maobe represented the department.
11. On farm trial at Mwea by Dr. G. N. Chemining'wa, Prof. P. M. Kimani and J. Kamanu, November 2012.
12. Farmer perception of Aflatoxin control using biological control – aflasafe in Eastern Province. 4<sup>th</sup> Oct 2012 and 5<sup>th</sup> Oct 2012 at Kangundo and Kathiani districts respectively.
13. Training SEUCO 2ndyear undergraduate students, on Familiarization with soil and crop science equipment and green house production practices, which included: Equipment to measure transpiration and quantity of light in crops, 24<sup>th</sup> May 2013. Maobe A. M. - Crop Science Section.
14. Training of students from Midas Golden Academy on familiarization of different crop pests.13<sup>th</sup> June 2013. Wagura J. K. – Entomology Unit.
15. Training of farmers on harvesting and postharvest handling of African leafy vegetables (ALVs) held on 12<sup>th</sup> to 14<sup>th</sup> June 2013, in Kakamega, Western Province. Dr. C.Onyango.
16. Training of farmers of postharvest handling and processing of mangoes and bananas in Nkubu, Meru Country held from 16<sup>th</sup> to 22<sup>nd</sup> June 2013 . Dr. C. Onyango.
17. On-farm trials of integrated. Crop Management technologies for snap bean production at Mwea. June 2013. Dr. G. N. Cheminingwa.
18. Kimani P. M. Appointed a member of the National Varieties Release Committee with effect from 24<sup>th</sup> May 2012, by the Ministry of Agriculture through the Managing Director of KEPHIS.
19. Documentation of women knowledge, experiences attitudes, perceptions and practices in relation to food security and providing relevant professional advice to women groups in Baringo County. Food security project coordinated by the Women Study Centre. – 15<sup>th</sup> to 20<sup>th</sup> April 2013. Prof. F. Olubayo and Dr. M. Hutchinson.
20. Meeting with farmer groups to discuss on their agriculture and innovation histories and mapping out their agriculture communication pathways. It also involved assessment of the impact of their innovation activities on their incomes and livelihoods, and on the local economy.
21. Dr D. W. Miano. Training of Virus resistance cassava for Africa (VIRCA) Project staff on Regulatory compliance on Biosafety. Held on 18<sup>th</sup> December 2012 at KARI Mtwaya.
22. Dr D. W. Miano. Training of Virus resistance cassava for Africa (VIRCA) Project staff on Regulatory compliance on Biosafety. Held on 18<sup>th</sup> December 2013 at KARI Alupe



## RESEARCH ACTIVITIES

### 1. Seed Enterprise Management Institute (Semis) Project

[www.semis-africa.org](http://www.semis-africa.org)

The Seed Enterprise Management Institute (SEMIs) is a collaborative capacity building and food security initiative between the University of Nairobi, Alliance for a Green Revolution in Africa (AGRA), Iowa State University (ISU), International Maize and Wheat Improvement Centre (CIMMYT), Kenya Agricultural Research Institute (KARI), Kenya Plant Health Inspectorate Services (KEPHIS), private and public Institutions in the seed sector and independent consultants. SEMIs was established in February, 2000 with the primary objective of providing capacity to the seed industry in sub-Saharan Africa.

#### SEMIs Management:



Professor Agnes Mwang'ombe is the SEMIs PI and the principal of the the College of Agriculture and Veterinary Sciences. She holds a BSc. Agriculture - University of Nairobi, MSc. Plant Pathology - University of Nairobi, and a PhD. degree and DIC in Plant Pathology - Imperial College



Professor Florence Olubayo is an Agricultural Scientist and Associate Professor with emphasis in Integrated Crop Pest management, Post harvest pest management and Agricultural Technology transfer. She holds a PhD in Agricultural Entomology from the University of Newcastle Upon Tyne (UK), MSc in Agricultural Entomology and BSc in Agriculture from the University of Nairobi. She is a member of the SEMIs management team and a resource person in some of the training courses



Professor Kiarie Njoroge holds a PhD in Plant Physiology and Breeding from Cambridge University (England), an MSc in Agricultural Botany from University of Wales (UK) and a BSc (biological sciences) from University of Nairobi (Kenya). He is a member of the SEMIs management team and a resource person in the training courses.



Dr . David K. Ndung'u is the project Manager of SEMIs involved in the day to day running of the project. Dr. Ndung'u is a plant breeder with a PhD degree in plant breeding from the University of KwaZulu Natal.

Other staff includes Florence Kiwunja, the office administrator, Rosebenna Cherono a field technician and, Francis Maina, Caroline Ndumi, and Basil Kirangu who assist in field operations.

#### Seed Courses offered at SEMIs:

The main objective of SEMIs is to provide capacity to the seed industry in sub-Saharan Africa. SEMIs trains seed sector personnel from across sub-Saharan Africa on seed technology and business. Most of these seed sector personnel are staff from seed companies operating from across the continent, who are in need of short term training on seed issues right from production to marketing and distribution. Currently the project is concentrating on five very important seed courses:

#### i. Seed production:

- The overall objective of the course is to enhance the participants' practical knowledge and skills for quality seed production and regulatory aspects of seed production in a commercial context.

#### ii. Seed drying, processing and storage:

- The course is structured to equip the participants with practical knowledge of the basic concepts involved in drying, processing and storage operations typically utilized to prepare a seed lot for marketing and use.

- ii. Seed Business Management:
  - This course is designed to expose participants to knowledge of sound business practices which will enable them to build healthy and sustainable seed enterprises.
- iii. Seed Marketing:
  - The overall objective of the course is to enhance participants' knowledge and skills on effective marketing approaches which will enable them to better serve and retain their existing customers and attract new ones.
- iv. Seed Quality assurance and Seed Enterprise Quality Management:
  - The overall objective is to enhance participants' practical knowledge and skills on seed testing, quality assurance and certification, and quality procedures that relate to overall quality of different departments within the seed company

Over the four years that SEMIs has been operational, 528 seed practitioners from 17 sub-Saharan African countries, including, Uganda, Tanzania, Zambia, Malawi, Ethiopia, Mozambique, Nigeria, Niger, Ghana, Mali, Burkina Faso, Guinea, Sierra Leone, Liberia, Cameroon, South Sudan and Kenya, have received training on seed technology and business at SEMIs.

| Course  | 2010       | 2011       | 2012       | 2013      | Total      |
|---|------------|------------|------------|-----------|------------|
| Seed Production   | 29         | 27         | 30         |           | 86         |
| Seed Drying Processing and Storage                            | 31         | 28         | 31         |           | 90         |
| Seed Business Management                                      | 29         | 26         | 29         | 25        | 109        |
| Seed Marketing  | 28         | 25         | 30         | 27        | 110        |
| Seed Quality Assurance  | 30         |            |            |           | 30         |
| Seed Legislation and Accreditation                            | 25         |            |            |           | 25         |
| Seed Quality Assurance and Seed Enterprise Quality Management |            | 26         | 29         |           | 55         |
| <b>Total( Yearly)</b>   | <b>172</b> | <b>132</b> | <b>149</b> | <b>52</b> | <b>505</b> |

The technical knowledge acquired at SEMIs by these seed company personnel is translating into increased seed volumes and enhanced quality of seed resulting in increased food production and poverty alleviation within the continent. SEMIs is also enhancing linkages between individual seed companies, and seed companies and public and private institutions for improved business.



SEMIs Lecture session at the College of Agriculture and Veterinary sciences (CAVS)



SEMIs laboratory practical sessions at CAVS



SEMIs seed practitioners in a lab session at CAVS



SEMIs participants visiting an Agro-dealer shop to familiarize with movement of seed in the seed value chain.



SEMIs concentrates a lot on experiential training-SEMIs participants on a visit to the Njoro wheat breeding facility



SEMIs participants on visit to Dryland Seed company in Machakos Kenya

The SEMIs instructors and facilitators are drawn from the University of Nairobi, KEPHIS, KARI, Iowa State University, CIMMYT, seed companies and other public and private institutions engaged in the seed value chain.

#### Bean project at SEMIs:

Apart from training seed practitioners SEMIs is also involved in bean Seed production at CAVS. One of the major challenges for food security is availability of foundation seed that is required by seed companies for seed bulking and production of certified seed. SEMIs is producing Breeder seed of high yielding bean varieties developed and bred at UON and in the process helping seed companies upscale seed production and ensuring the benefits of research in the form of new varieties developed are accessible to the end user who is the small scale farmer.



Bean seed crop at field station at CAVS



The principal CAVS, professor Mwang'ombe, officially handing over a consignment of breeder seed to Simlaw seed company (an affiliate of Kenya seed company) CEO, Mr. Azarai Soi.



#### SEMs Infrastructure Development:

In order to maximize benefits of seed for the small-scale farmer, SEMs is also developing infrastructure for certified seed production. The SEMs seed processing unit constructed at the field station (CAVS) will have a production capacity of over 5 metric tons of seed per hour upon completion. This unit will be used for processing of certified high quality seed for UNISEED, the university of Nairobi seed company. It will also be available for processing of seed from seed companies that do not have processing facilities.



The seed processing factory constructed at the field station is complete and soon a seed processing line will be installed in the facility

On completion of the seed processing facilities, SEMs will also construct a modern seed laboratory at the field station which will complement the seed processing unit. The seed laboratory is envisaged to be one of the Kenya Plant Health Inspectorate Service (KEPHIS) accredited seed laboratories that will in the near future be rolled out. These accredited seed laboratories will perform seed quality assurance on behalf of the regulator, KEPHIS in order to hasten the process of seed quality control and ensure that farmers can quickly access high quality seed for improved yields and poverty alleviation.

#### Disseminating Seed information:

To bridge the gap on seed information, the project has a website [www.semis-africa.org](http://www.semis-africa.org) that is a one-stop shop for seed-related information. SEMs staff also actively participate in agricultural conferences, meetings and workshops both within and without the African region.



SEMIs was represented at the Agricultural Sector development Forum (2012) which was graced by H.E. President Mwai Kibaki of Kenya



H.E. Mohamed Shein, president of Zanzibar visits the SEMIs stand at the African Seed trade Association (AFSTA) congress in Zanzibar in February 2012.

2. Enhancing the Postharvest Shelf Life of Passion Fruits Grown under Different Agro-Ecological Conditions through Application of an Ethylene Inhibitor, 1-Methylcyclopropene (1-MCP). involving JKUAT and University of Nairobi -- Dr. J. Ambuko (2011- 2012)

3. Strengthening Capacity for Marker Assisted Breeding for Common Bean in Eastern Africa, Investigators: Prof. P. M. Kimani, Dr. E. Ngugi, Dr. Narla. Funded by Kirkhouse Trust of United Kingdom. University of Nairobi, Makerere University. (2009-2012)
4. Improving incomes for smallholder farmers and other value chain actors through enhanced productivity, post harvest handling technologies, value addition and marketing of mango and passion fruit products. Funded by Kenya Agricultural Productivity and Agribusiness Program (KAPAP). Investigators: Dr. J. Ambuko, Mr. J. Njuguna, Dr. M. Mwangi, P. Mbogo, L. Wekesa, F. M. Kiilu, Dr. W. Owino, P. Mwangi Collaborators University of Nairobi, KARI, Kenyatta University, Kamurugu/RIDA, KEFRI, Kamumo Products, JKUAT, KENFAP. (2011-2014)
5. Multipurpose legumes and management strategies for reinvigorating and maintaining the health and productivity of smallholder mixed farming systems. Funded by Mcknight Foundation. Investigators: Dr. J. W. Muthomi, Dr. Ojiem, Prof. J. H. Nderitu, Dr. S. Mwonga. University of Nairobi, KARI, Egerton University, Cornell University, Food Supply Organization (REFSO). (2011-2013).
5. Conserve and screen premium value indigenous plant biodiversity and products on small-holder farming systems of Lake Basin in East Africa. Funded by RUFORUM. Investigators: Dr. Namutebi, Prof. L. S. Akundabweni University of Nairobi Makerere University. (2011-2013)
6. Mechanisms for multiplication and distribution of disease free planting material for improved passion fruit production National Council for Science and Technology. Investigators: Dora C. Kilalo, Dr. M. Hutchinson, Mr. Kori Njuguna, Dr Esther Kimani, Mrs. Lucy Njenga, Mrs. Lydia Njuguna Collaborators. University of Nairobi, KARI, KEPHIS, Ministry of Agriculture, KHCP. (2011-2013).
7. Passion fruit diagnostics and identification of passion fruit viruses. Funded by Australian Challenge Fund. Investigators: Dora C. Kilalo. Collaborators: University of Nairobi, BecA-Hub ILRI, KEPHIS, KARI. (May 2012-Oct 2012).
8. Development of Integrated management methods for banana weevil in Central province. Funded by National Council for Science and Technology. Investigators: Dr. Shelminth Waruguru, Prof. J. Kimenju & D. Kilalo. Collaborators: KARI, University of Nairobi, JKUAT. (2012-2014)
9. Enhancing sorghum production, processing and marketing for improved small-holder incomes and livelihoods in Kenya Kenya Agricultural Productivity and Agribusiness. Project Funded by (KAPP) Investigators: Dr. Erick Cheruiyot, Dr. E. Ngugi, Prof. G. Ouma, Mr. M. Kaibui, Dr. J. Mutysia, Dr. J. Mukhwana, Dr. I Agina, Dr. J. Mutunga, Mr. L. Maina. University of Nairobi, Egerton University, Bondo University, JKUAT, SACRED Africa, KARI, Spectra International –Kisumu, East African Breweries. (2011-2013)
10. Amaranth grain production and value addition for improved livelihoods in the Lake Victoria Basin (LVB). Funded by VicRes. Investigators: Dr. D. Nakinbugwe, Dr. R. Nyankanga, Dr. J. Mugisha, Mrs. D. Madinde, Ms. W. Nyamota. Collaborators: University of Nairobi, Makerere University Uganda, VEDCO. (2008-2012)
11. Value added bean technologies for enhancing food security, nutrition, income and resilience to cope with climate change and variability challenges in Eastern Africa. Funded by Bioresources Innovation Network for Eastern Africa Development (Bio-Innovate). Investigators: Prof. P. M. Kimani/Mr. D. Karanja. Collaborators: University of Nairobi, KARI, ISABU (Burundi), Trufoods (K) Ltd, PABRA (Uganda), SARI (TZ), Sokoine University of Agriculture (TZ) ISIR (Rwanda) & EAIR (Ethiopia). (2011-2013).
12. Improving tropical legume productivity for marginal environments in sub-Saharan Africa. Funded by GCP/CIAT. Investigators: Prof. P. M. Kimani. Collaborators: University of Nairobi (CIAT, EAIR (Ethiopia), PABRA, Agric Research Council-Zimbabwe, CIAT-Malawi, Chitedze Agric Research Institute-Malawi. (2009-2012).
13. Strengthening Capacity for Marker Assisted Breeding for Common Bean in Eastern Africa. Funded by Kirkhouse Trust of United Kingdom. Investigators: Prof. P. M. Kimani, Dr. E. Ngugi, Dr. Narla. Collaborators: University of Nairobi, Makerere University. (2009-2012.)
14. Enhancing Kenya's food security in the face of climate change through improved potato productivity Funded by National Council for Science and Technology. Investigators: Dr. R. Nyankanga Dr. Charles Lungaho, Prof. S. Shibairo. Collaborators: University of Nairobi KARI-Tigoni. (2011-2014).
15. Screening finger millet varieties for adaptation to drought prone ecological regions of eastern Kenya as a strategy to combat food insecurity and climate change. Funded by National Council for Science and Technology. Investigators: Prof. S. Shibairo, Dr. R. Emongor, Dr. C. A. Oduori, Dr. J. Ambuko, Dr. R. Onwonga. Collaborators: University of Nairobi, KARI. (2011 – 2013).
20. Contribution of *Cleome gynandra* (cat's whiskers) to food, nutrition and income for rural populations. Funded by UoN Deans Committee grant. Investigators: Dr. Cecilia M. Onyango, Dr. R. Narla, Dr. Catherine N. Kunyanga (2011-2014).
21. Occurrence and evaluation of maize germplasm to common rust disease in Kenya. Funded by UoN Deans Committee grant. Investigators: Dr. W. Muiru. (2011-2014).
22. Building human and institutional capacity for enhancing the conservation and use of neglected and underutilized species of crops in West Africa, and Eastern and Southern Africa. Funded by International Foundation for Science. Investigators: Dr. K. Njoroge, Dr. Ekaya, Dr. Per Rudebjer, Dr. Nighisty Ghezae, Dr. Sebastian Chakeredza. Collaborators: University of Nairobi, RUFORUM, IFS, Bioversity International, African Network for Agriculture, IRDCAM- (Benin), PGRRI (Ghana), University of Malawi. (2009-2013)

23. Management of the African white rice stem borer, *Maliarpha separata* ragonot (*Lepidoptera: pyralidae*) in Kenya. Funded by National Council for Science and Technology. Investigators: Vincent M. Kega, Prof. J. Nderitu and Prof. F. Olubayo. (2010-2012).
24. Role of hormonal cross talk and signaling in the postharvest physiology of lisianthus cut flowers. Funded by National Council for Science and Technology. Investigators: Nicodemus N. Musembi, Prof. K. Waithaka, Dr. M. Hutchinson. (2010-2012).
25. Abundance, genetic diversity and nodulation efficiency of cowpea (*Vigna unguiculata* L.) rhizobia in South Western Kenya soils. Funded by National Council for Science and Technology. Investigators: Jonah Ngeno, Dr. G. N. Chemining'wa, Prof. S. Shibairo. (2011-2013)
26. Enhancing productivity of maize – cowpea intercropping systems in coastal lowland Kenya through drought resilient varieties and improved water and nutrient management. Funded by National Council for Science and Technology. Investigators: James Ndiso, Dr. G. N. Chemining'wa, Prof. F. Olubayo. (2011-2013)
27. Selection for Pod quality and multiple disease resistance in bush and climbing snap beans. Funded by RUFORUM, Collaborators Prof. P. M. Kimani (PI) Dr. R.D. Narla, Dr. G. Chemining'wa, Dr. J. Muthomi, and Prof. J. H. Nderitu. Collaborators; University of Nairobi, KARI. (2012-2014)
28. Improving profitability of the mango value chain through strategies for off-season flower induction, proper harvest scheduling and appropriate postharvest handling practices and technologies. Funded by RUFORUM Investigators: Dr. J. Ambuko Prof. S. Shibairo Dr. M. Hutchinson. Collaborators; JKUAT, University of Nairobi (2012-2014)
29. Cassava post-harvest value addition for improved food and nutrition security and better livelihoods in Kenya. Funded by East African Agricultural Productivity Project. Investigators; Prof. S. Shibairo, Prof. Okoth, Dr. G. Ooko, Mr. Lamuka Collaborators; KARI, Egerton, University of Nairobi. (2012-2015)
30. Enhancing cassava productivity through molecular breeding for resistance to cassava mosaic disease and cassava brown disease, Funded by East African Agricultural Productivity Project, Investigators: Dr. W. M. Muiro Dr. D. W. Miano. Collaborators University of Nairobi, Kenyatta University and KARI.(2012-2015)
31. Promotion of Snap Bean Integrated Crop Management Technologies for Improved Livelihoods in Eastern & Central Africa. Funded by ASARECA. Investigator: Dr. G. Chemining'wa. University of Nairobi, National Crops Resources Research Institute (NaCRRRI), Selian Agricultural Research Institute (SARI) and Mt Kenya University. (Dec 2012-Oct 2013)
32. Validation of Multiple disease Resistant Snap Bean Varieties for Local and Export Markets. Funded by ASARECA. Investigators: Prof. P. M. Kimani, Dr. R. Narla. Collaborators National Crops Resources Institute (Uganda), Rwanda Agricultural Board (Rwanda), Kenya Plant Health Inspectorate Services and University of Nairobi, (Dec 2012-Oct 2013).
33. Innovation systems, agricultural growth and rural livelihoods in East Africa, Funded by DFID-ESRC Growth Programme. Investigators: Prof. Chris Garforth, Dr. Peter Dorward and Dr. Sarah Cardey (University of Reading-leading team) Prof. Florence Olubayo and Dr. Rose Nyikal (University of Nairobi collaborators). Collaborators: Makerere University (Uganda), Ahfad University for Women (Sudan) and University of Kiel (Germany). (June 2012-July 2014).
34. Post-harvest Management Training Project. Investigators: University of Sydney, Prof. Florence Olubayo (Coordinator-University of Nairobi). Collaborators; University of Stellenbosch (South Africa) and Kwame Nkrumah University of Science and Technology (Ghana) Prof. Robyn McConchie (PI). (June 2012-December 2013)
35. Enhancing Food, Nutrition Security and Incomes among Smallholder Farmers Through Production and Value-Addition of Indigenous Vegetables. Prof. A.W. Mwang'ombe (PI), Dr. Margaret Hutchinson (Coordinator), Other Investigators: Dr. Jane Ambuko, Dr. J.J. Okello. Collaborators: KARI Mtwapa and Coast Development Authority. 2011-2014
36. Promoting and Advocating for Implementation of Article 43(1) (C) on Food Security. Investigators: Dr. M.J. Hutchinson (PI) and Prof. Wanjiku Kabira (African Women Studies Centre, UON). Funded by SUNY-KENYA (2011-2012)
37. Advocating for The Right to Food Security: Actualization of Article 43(1)c of the Kenyan Constitution. Dr. M.J. Hutchinson (PI), Drs Gerishon Ikiara (CO-PI), Prof. Tabitha Kiriti-Nganga (CO-PI), Dr. M.L. Mbithi (CO-PI) and Prof. Wanjiku Kabira (Coordinator). Funded by the Government of Kenya. July 2012-June 2013
38. Harnessing Genomics of Edible African *Solanaceae* Plants for Improved Nutritional and Food Security. Partnerships for Enhanced Engagement in Research (PEER) Science funded by USAID-NSF (2013 – 2015). Partners: Dr. Willis Owino JKUAT (PI), Dr. Jane Ambuko (Co-PI, UON) and James Giovannoni (Co-PI, Cornell University).
39. Diversifying Food Systems: Horticultural Innovations and Learning for Improved Nutrition and Livelihood in East Africa (HORTINLEA) – (2013 – 2015). Collaborative project between German and East African Universities/Research Institutions. Dr. Jane Ambuko (Partner/PI, University of Nairobi)
40. Minimizing Postharvest Losses among Mango Farmers through Training on Good Harvest and Postharvest Handling Practices. Trellis Fund Student Capacity Building Project supported by Horticulture CRSP and USAID. University of Nairobi in collaboration with University of California, UC Davis, USA (2013-2014). Jane Ambuko (PI), Dr. Margaret Hutchinson and Msc Horticulture Students (Nancy Kemunto, Lilian Ouma and Penina Yumbya).
41. Genetic Characterization of Eastern and Southern African *Cleome gynandra* (Spider Plant) species for nutritional and health promoting bioactive compounds. Co-funded by Kenya Government through National Council for Science and



- Technology (NCST) and South African Government through National Research Foundation (NRF) – (2013 – 2014). Dr. Jane Ambuko (Kenyan PI, UON) and Dr. Bridget Crampton (South African PI, University of Pretoria)
42. Improving profitability of the mango value chain through strategies for off-season flower induction, proper harvest scheduling and appropriate postharvest handling practises and technologies. Funded by Regional Universities Forum (RUFORUM) – (2012-2014). Jane Ambuko (PI), Dr. Margaret Hutchinson, Prof. Solomon Shibairo, Dr. Willis Owino (JKUAT) and Mr. Joseph Njuguna (KARI)
  43. Improving incomes for smallholder farmers and other value chain actors through enhanced productivity, post harvest handling technologies, value addition and marketing of mango and passion fruit products. Funded by the Kenya Government through the Kenya Agricultural Productivity and Agribusiness Project (KAPAP). Mr. Joseph Njuguna (PI – KARI ), Dr. Jane Ambuko (UON Partner), Dr. Willis Owino (JKUAT Partner), Dr. Maina Mwangi (KU Partner), Private Sector Processors
  44. Promotion of Greenhouse Farming for Food Security and Wealth Creation in Western Kenya. Funded by the Kenya Government through National Council for Science and Technology (NCST) – (2012 – 2014). Prof. Mabel Imbuga (PI – JKUAT), Dr. Jane Ambuko (Partner, UON) Frida Marete (Partner, Agro-tunnel International)
  45. Supporting investments in up scaling of grain legumes in western Kenya through assessing and modeling the threat of biotic stressors”. Funded by the McKnight Foundation. Dr. Mathew Abang (CIAT), Dr. J. W. Muthomi, Dr. Ogecha (KARI), Dr. Hassan Were (Masinde Muliro University of Science and Technology), Dr. J. M. Wagacha, MacDonald Wesonga (ARDAP).September 2012 to February 2014.
  46. Integrated management of Banana *Xanthomonas* Wilt (*Xanthomonas campestris* pv. *musacearum*) in Kenya through cultural and host resistance. Funded by the National Council for Science and Technology (NCST) for PhD training of Mr. Johnson K. Kwach. October 2011 to September 2014.
  47. Sustainable Management of Banana *Xanthomonas* Wilt (BXW) in Banana Cropping Systems in the ECA”. Funded by ASARECA. J. K. Kwach, J. W. Muthomi. October 2012 to October 2013

#### COLLABORATIONS WITH OTHER INSTITUTIONS

- University of Nairobi, Department of Plant Science and Crop Protection and University of Stellenbosch(South Africa) and Kwame Nkrumah University of Science and Technology (Ghana)
- University of Nairobi, Department of Plant Science and Makerere University(Uganda), Ahfad University for Women (Sudan) and University of Kiel (Germany)
- University of Nairobi and ), Kenya Plant Health Inspectorate Services (KEPHIS)
- University of Nairobi and Kenya Agricultural Research Institutions (KARI)
- University of Nairobi, RUFORUM, IFS, Bioversity International, African Network for Agriculture, IRDCAM-(Benin), PGRI (Ghana), University of Malawi
- University of Nairobi, KARI, Egerton University, Cornell University, Food Supply Organization (REFSO)
- University of Nairobi, KARI, Kenyatta University, Kamurugu/RIDA, KEFRI, Kamumo Products, JKUAT, KENFAP

#### Publications in Refereed Journals

1. Joseph Bigirimana, Kiarie Njoroge, Daphrose Gahakwa and Noah A. Phiri 10 July, 2012. Incidence and severity of coffee leaf rust and other coffee pests and diseases in Rwanda African Journal of Agricultural Research Vol. 7(26), pp. 3847-3852
2. Chemining'wa George N., Ngeno J., Muthomi J.W and Shibairo S.I. 30th September 2012. Effectiveness of indigenous pea rhizobia (*Rhizobium leguminosarum* bv. *viciae*) in cultivated soils of central Kenya. Journal of Applied Biosciences 57: 4177– 4185.
3. Kamanu J.K., Chemining'wa G.N., Nderitu J.H. and Ambuko, J. July 27th 2012. Growth, yield and quality response of snap bean (*Phaseolus vulgaris* L.) plants to different inorganic fertilizers applications in central Kenya. Journal of Applied Biosciences 55: 3944– 3952.
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6. O.M. Kitonyo, G.N. Chemining'wa, J.W. Muthomi. 2013. Productivity of farmer-preferred maize varieties intercropped with beans in semi-arid Kenya International Journal of Agronomy and Agricultural Research (IJAAR), Vol. 3, No. 1, p. 6-16.
7. G. N. Chemining'wa, Peter Mwangi M.W.K. Mburu and J.G. Mureithi 2013. Nitrogen fixation potential and residual effects of selected grain legumes in a Kenyan soil. International Journal of Agronomy and Agricultural Research Vol. 3(2): 14-20
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12. Kahia Ngugi, Cecilia Onyango, 2012 Sept. Analysis of the molecular diversity of Kenyan sorghum germplasm using microsatellites. *J. Crop. Sci. Biotech.* 15(3): 189-194.
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33. Baraza, A., Ambuko, J., Kubo, Y. and Owino, W.O. 2013. Effect of agro-ecological zone and maturity on the efficacy of 1-Methylcyclopropene (1-MCP) in extending postharvest life of purple passion fruits (*Passiflora edulis* Sims). *Acta Horticulturae*: 1007:73-80.
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42. R. Nyankanga, M. Njogu, J. Muthomi and M. Olanya: 2012. Efficacy of fungicide combinations, phosphoric acid and plant extract from stinging nettle on potato late blight management and tuber yield. *Archives of Phytopathology and Plant Protection*, 45 (12): 1449-1463.
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45. Wangai, A.W., Redinbaugh, M.G., Miano, D.W., Kinyua, Z. M., Leley, P.K., Kasina, M., Mahuku, G., Scheets, K., and Jeffers, D. 2012. First report of *Maize chlorotic mottle virus* and maize (corn) lethal necrosis in Kenya. *Plant Disease* 96 (10): 1582: <http://dx.doi.org/10.1094/PDIS-06-12-0576-PDN>.
46. J. A. Tomlinson, S. Ostoja-Starzewska, I. P. Adams, D. W. Miano, P. Abidrabo, Z. Kinyua, T. Alicai, M. J. Dickinson, D. Peters, N. Boonham, J. Smith. 2012. Loop-mediated isothermal amplification for rapid detection of the causal agents of cassava brown streak disease. *Journal of Virological Methods* 191(2): 148-54.
47. Shem K. Khakame, Paddy Likhayo, Florence Olubayo and John H. Nderitu, 2012. Effect of grain moisture content and storage time on efficacy of inert and botanical dusts for the control of *Sitophilus zeamais* in stored maize. *Journal of stored products and postharvest research* vol. 3 (10), pp:145-151.
48. V.M. Kega, M. Kassina, F. Olubayo and J. H. Nderitu, 2013. Management of *Maliarpha separattella* Rag. Using effective Entomopathogenic Nematodes and resistant Rice Cultivars. *Journal of Entomology*, 10(2): 103-109.

#### PAPERS PRESENTED AT WORKSHOPS/CONFERENCES

(a) **Annual JEPAK Conference at Panafric Hotel, Nairobi, 22<sup>nd</sup> November 2012.**

Ratemo W. Michieka. The boy child vs the girl child: is the reality dawning

(b) **All Africa Horticultural Congress (AAHC), Skukuza, South Africa 15-20<sup>th</sup> January, 2012.**

Ambuko, J., R.W. Githiga, M.J. Hutchinson, H. Gemma and W.O. Owino. 2012. Effect of maturity stage and variety on the efficacy of 1-MCP treatments in Mango fruits

(c) **International Conference on Youth in Africa. Book of Abstracts Page 8.**

Githiga, R., Ambuko, J., Hutchinson, M.J., Shibairo, S.I. and Owino, W.O. 2012. Effect of Stage of Maturity on the Efficacy of 1-MCP in Tommy Atkins Mango Fruits.

**(d) 3<sup>rd</sup> RUFORUM Biennial conference, Imperial Resort Beach Hotel, Entebbe Uganda, 24<sup>th</sup> to 28<sup>th</sup> September 2012.**

2. Kimani, P.M., Narla, R.D., Chemining'wa, G., Muthomi, J. and Nderitu, J.H. Selection for pod quality, multiple disease resistance and photoperiod insensitivity in bush and climbing snap beans.
3. P.M. Kimani, R.D. Narla, S. Wahome, G. Chemining'wa, J. Muthomi, and J. H. Nderitu. Variation For Multiple Disease Resistance And Pod Traits In Early Generation Snap Bean Population Bulks.
4. Nzuve F.M., Bhavani, S., Tusiime, G., Njau, N. 2012. Field screening of bread wheat for partial resistance to stem rust. Third RUFORUM Biennial Regional Conference held from the 24<sup>th</sup> - 28<sup>th</sup> September 2012, Entebbe, Uganda. Partnerships and Networking for Strengthening Agricultural Innovation and Higher Education in Africa.
5. S. Munialo, L.S.M. Akundabweni.: Investigating viability of Premium Influenced Land Use Structure in production of quality indigenous vegetable
6. Ambuko, Jane, Willis Owino, Solomon Shibairo, Margaret Hutchinson and Joseph Kori Njuguna. 2012. Improving profitability of the Mango Value chain through Strategies for off-season flower induction, reliable maturity indices and applicable postharvest handling technologies. Project Poster presented at the 3<sup>rd</sup> RUFORUM Biennial Regional Conference. Imperial Resort Beach Hotel- Entebbe, Uganda.. WON BEST POSTER AWARD.

**(e) The 13th KARI biennial conference held 22<sup>nd</sup> to 26th October 2012 at KARI Headquarters Complex, Kaptagat Road, Loresho, Nairobi**

9. R. W. Weru, J. W. Muthomi, G. N. Chemining'wa and E. W. Mutitu. 2012. Resistance of maize varieties to infection by *Aspergillus flavus* and aflatoxin accumulation.
10. F. K. Tom, J. W. Muthomi, F. M. Olubayo and G. N. Chemining'wa. 2012. Susceptibility of locally grown maize varieties to infestation by maize weevil (*Sitophilus zeamais Motsch*)
11. Mureithi, B. K., Muthomi, J. W., Chemining'wa, G. N. and Mutitu, E. W. 2012. Identification of predisposing factors to aflatoxin contamination of maize value chain in eastern Kenya.
12. Kwach J. K., Onyango M. A., Muthomi J. W., and Nderitu J. H. Baseline survey for status of Banana Xanthomonas Wilt in Kenya
13. Nzesya J.M., Kimenju, J.W., Muiru, W.M., Gichuru, E.K., Mutua, G.K. and Wachira, P. M. Reaction of coffee germplasm to root-knot (*Meloidogyne* spp.) nematodes
14. Ogecha J., Nderitu J. H., Ariga S. E. and Olubayo F. Effect of soil fertility amendments with nitrogen, phosphorus and farmyard manure on crop nutrient contents, bean stem maggot infestation and yield of common beans (*Phaseolus vulgaris*(L.) in western Kenya
15. Okati S. J. K., Wangia S. S. M, Mbugua P., Kimenju J. W., Mutiga, Kinama J., Ojoo R., Ndutu J., Mongare P. Impacts of climate variability on the livestock based livelihood in Enkaroni Location of Kajiado District.
16. Kega V. M., Nderitu J. H., Olubayo F. and Kasina M. Assessment of yield loss due to *Maliarpha separatella* Ragonot (Lepidoptera: pyralidae) on rice at Mwea Irrigation Scheme, Kenya.
16. Karanja L. W., Wachira P. M., Muthomi J. W., Phiri N. A., Mutegi C. K., Nzioki H.S., Gikaru A. K., Kanampiu F. and Wagacha J. M. 2012. Use of geographical information system to determine incidence of *Aspergillus* section *flavi* in different soils in Kaiti, Kenya.
17. Miano D. W., Obiero H. M., Gichuki S. T., Munga T., Halsey M, Taylor N. and Fauquet C. 2012. Development of transgenic farmer preferred cassava with resistance to cassava mosaic disease in Kenya. 13<sup>th</sup> Biennial Scientific Conference held on 22<sup>nd</sup> – 26<sup>th</sup> October 2012, at KARI Headquarters, Nairobi, Kenya
18. Muthamia J. G. N., Kimani P., Esilaba A. and Chemining'wa G. A review of phosphorus nutrition in bean plant.

**(f) HAK Workshop on sustainable horticultural production in the tropics, Bondo University College (BUC), Kisumu, 4<sup>th</sup> to 7<sup>th</sup> December 2012.**

19. Kihara S.N., Muthomi J.W., Okoth S., Wamae L.W., Kangethe E.K. And Hannu J.K. Occurrence of fumonisin contaminated maize in Makueni county, Kenya.
20. Wachira P.M., Kimenju J.W., Kiarie J.W. and Mwaniki S.W., Diversity of nematode destroying fungi in banana based farming systems in Maragua, Kenya.
1. Mutembei M. Kimenju W.J. and Narla R.D. Agronomic practices, postharvest challenges and handling of avocado in three districts of Central Kenya.
2. Yumbya P, Ambuko J., Shibairo S.I. and Owino W.O. Effect of Activebag packaging on the shelf life and postharvest quality of purple passion fruit (*Passiflora edulis sims*).
3. Kemunto O.N., Ambuko J., Hutchinson M.J. and Owino W.O. Effect of concentrations of 1-methylcyclopropene on the postharvest characteristics of "apple" mango (*Mangifera indica* L.) fruits harvested at different maturity stages.
4. Maina J.G., Ambuko J., Lopokoiyot M.C. and Chemining'wa G.N. Evaluation of teaching methods used by lecturers in faculties of agriculture at Nairobi and Egerton Universities in Kenya.
5. Kuboka M., Maniania N.K., Muthomi, J.W., Narla R.D. and Subramanian S. Effect of temperature on germination, radial growth, sporulation and virulence of *Metarhizium anisopliae* isolate ICIPe 69 on *frankliniella occidentalis*.

6. Baraza A. Ambuko J and Owino W.O. The effect of agro ecological zone on the post harvest quality and shelf life of purple passion fruits (*Passiflora edulis* simis).

**(g) Abstract submitted to BGRI technical workshop at Beijing, China**

F. Nzuve, S. Bhavani and P. Njau.2012. Genetic analysis of resistance to stem rust in five bread wheat lines. Borlaug Global Rust Initiative; globalrust.org; Proceedings, BGRI 2012 Technical Workshop, September 1-4, Beijing, China. ISBN: pp. 163. 13: 978-0-615-70429-6

**WORKSHOPS AND CONFERENCES**

1. Kimani, P. M. Bean Consortium Planning and Review Meeting, Addis Ababa, Ethiopia, July 2012.
2. NEPAD – FARA Workshop: Towards formation of CAADP Country Core Education. (3C Edu) Groups, World Bank Offices, Nairobi Kenya. July 29-30<sup>th</sup>, 2012
3. Nzuve, F. M. AWARD Women's leadership and management course workshop, Indian Ocean Beach Club, Diani, Mombasa Kenya, 19<sup>th</sup> to 25<sup>th</sup> August 2012.
4. Olubayo, F. O. Participated as judge at the 1<sup>st</sup> National Science and Technology and innovation week, at KICC, Nairobi 7<sup>th</sup> –11<sup>th</sup> May 2012,.
5. Olubayo, F. O. Participated as judge at the African forum on Science, Technology and innovation for youth empowerment, human capital development and inclusive growth. 30<sup>th</sup> April to 2<sup>nd</sup> May 2012.
6. Miano, D. W., SCIFODE meeting, Kampala, Uganda, 18<sup>th</sup> to 21<sup>st</sup> July 2012.
7. Olubayo, F. O. Workshop to review the innovation grant applications under the National Council for Science and Technology at KCB, Karen, 16<sup>th</sup> –17<sup>th</sup> August 2012.
8. Olubayo, F. O. Workshop to review the women scientists research grant applications under the National Council for Science and Technology at Utali Hotel, 11<sup>th</sup> to 14<sup>th</sup> September 2012.
9. Chemining'wa G. N. and Njoroje, K., Rice Research Planning Meeting, Trakya Agricultural Research Institute (TARI), Edirne, Turkey 16<sup>th</sup> to 20<sup>th</sup> September 2012.
10. Shibairo, S.I., Akundabweni, L., Chemining'wa, G.N., Ambuko, J. L., Nzuve Felistas and Kimani, P. M.. 3<sup>rd</sup> RUFORUM Biennial conference, Imperial Resort Beach Hotel, Entebbe Uganda, 24<sup>th</sup> to 28<sup>th</sup> September 2012.
11. Mwang'ombe, A. W., Olubayo, F.O., Cheronon, R., African Green Revolution Forum, Arusha, Tanzania, 24<sup>th</sup> to 29<sup>th</sup> September 2012.
12. Ambuko, J. L. Training in AUDRC in Arusha, Tanzania, 6<sup>th</sup> October to 13<sup>th</sup> October 2012.
13. Akundabweni, L.S., Workshop to present the draft final pre-feasibility report on irrigation development and watershed management in the Lake Victoria Basin, Mwanza, Tanzania, 11<sup>th</sup> to 12<sup>th</sup> October 2012.
14. Akundabweni, L.S., Workshop to for CRSP-East Africa targeted Investment for research (EATIRI) Programme, 15<sup>th</sup> to 17<sup>th</sup> October 2012.
15. Hutchinson M. J., Conduct Leadership Training for ASARECA Managers, Kigali, Rwanda, 15<sup>th</sup> to 19<sup>th</sup> October 2012.
16. Miano, D.W., VIRCA-II Steering Committee meeting, Donald Danforth Plant Science Centre in St. Louis, Missouri, USA, 20<sup>th</sup> to 30<sup>th</sup> October 2012.
17. Olubayo, F. O., 13<sup>th</sup> KARI Biennial conference, 2012 participated as paper reviewer and judge during the conference. 22<sup>nd</sup> to 26<sup>th</sup> October 2012.
18. Miano, D.W., ATPS Annual Conference and Workshop/Annual General Meeting, Addis Ababa, Ethiopia, 19<sup>th</sup> to 21<sup>st</sup> November 2012.
19. Chemining'wa, G. N., FP7 Training under BIOCIRCLE in Accra, Ghana, 22<sup>nd</sup> to 23<sup>rd</sup> October 2012.
20. Chemining'wa, G. N., Ambuko, J. L., Onyango, C. M., Kimani, P. M. Workshop for Development of full ASARECA proposal for the Staple crops project in Mukono, Uganda, 29<sup>th</sup> October to 2<sup>nd</sup> November 2011.
21. Njoroje, K. Workshop on EU-AV Cooperation in Arusha, Tanzania, 24<sup>th</sup> to 27<sup>th</sup> October 2012.
22. Miano, D.W., Expert working group meeting to draft document describing biology of cassava in Serena Lake Victoria Hotel, Entebbe, Uganda, on 26<sup>th</sup> to 27<sup>th</sup> November 2012.
23. Chemining'wa, G. N., Stakeholder curriculum review workshop Egerton University.
24. Ambuko, J. W. (with the followind students Ouma L., Kemunto N. O, Yumbya P.) HAK Workshop on sustainable horticultural production in the tropics, Bondo University College (BUC), Kisumu, 4<sup>th</sup> to 7<sup>th</sup> December 2012.
25. Shibairo, S. I., Accreditation of Terra Nova in Somaliland, 18<sup>th</sup> December to 21<sup>st</sup> December 2012.
26. Kimani, P. M., Proposal writing with Kilmo Trust, Kampala, Uganda, 9<sup>th</sup> January to 10<sup>th</sup> January 2012.

27. Kimani, P. M., Bionnoviate Bean Technology Annual Review Meeting, Rwanda, 20<sup>th</sup> January to 23<sup>rd</sup> January 2013.
28. Kimani, P. M., Bionnovate Conference, Addis Ababa, Ethiopia, 25<sup>th</sup> January to 27<sup>th</sup> January 2013.
29. Miano, D. W., 12<sup>th</sup> International Symposium on Plant Virus Epidemiology, Arusha Tanzania, 27<sup>th</sup> January to 1<sup>st</sup> February 2013.
30. Ambuko, J. L., Stakeholder Workshop on the Code of Conduct and Ethics for Agricultural Professionals at KARI (Mtwapa) in Mombasa, 6<sup>th</sup> January to 9<sup>th</sup> January 2013
31. Ambuko J.L. AWARD fellows mentoring orientation workshop at Safari Park Hotel, Nairobi, 17<sup>th</sup> February to 23<sup>rd</sup> February 2013.
32. Ambuko, J.L., Hutchinson, M.J., Olubayo, F. KAPAP – Vegetable Value Chain – Planning workshop.
33. Onyango, C.M. Transformative Education, Research and Engagement for Dryland and Sustainability-Preparing the next generation
34. Miano, D.W. VIRCA-II Steering Committee Meeting, Donald Danforth Plant Science Center, St. Louis, MO, 24<sup>th</sup>-25<sup>th</sup> October, 2012.
35. Muthomi, J. W. The 2012 Borlaug Dialogue World Food Prize International symposium, 16<sup>th</sup> -19<sup>th</sup> October 2012, Des Moines, Iowa, USA.
36. Muthomi, J. W. 4<sup>th</sup>Annual Regional Conference for the East & Horn of Africa Community of Practice (E/HAfCoP). April 30 - May 4, 2012 in Kampala, Uganda
37. Muthomi, J. W. Sanitary and phytosanitary systems and agricultural education training. 15<sup>th</sup> August to 6<sup>th</sup> December 2012 at the University of Missouri-Columbia, USA. Course funded and organized by the Foreign Agricultural Service of the United States Department of Agriculture.
38. Muthomi, J. W. Professionalism and Ethics in agricultural sciences. 20<sup>th</sup> August to 6<sup>th</sup> December 2012, University of Missouri-Columbia, USA.
39. Muthomi, J. W. Sanitary-phytosanitary and pest risk analysis training. 26<sup>th</sup> November to 1<sup>st</sup> December 2012 at the Centre for Regulatory Research LLC, USA.
40. Muthomi, J. W. Mycotoxins in foods. 7<sup>th</sup> September to 4<sup>th</sup> December 2012 at the University of Missouri-Columbia, USA.
41. Muthomi, J. W. Curriculum development. 28<sup>th</sup> September to 2<sup>nd</sup> December 2012 at the Centre for Collaboration and Development of Educational Innovations, University of Missouri-Columbia, USA
42. Muthomi, J. W. The 2012 Borlaug Dialogue World Food Prize International symposium, 16<sup>th</sup> -19<sup>th</sup> October 2012, Des Moines, Iowa, USA.
43. Muthomi, J. W. 4<sup>th</sup>Annual Regional Conference for the East & Horn of Africa Community of Practice (E/HAfCoP). April 30 - May 4, 2012 in Kampala, Uganda
44. Muthomi, J. W. Sanitary and phytosanitary systems and agricultural education training. 15<sup>th</sup> August to 6<sup>th</sup> December 2012 at the University of Missouri-Columbia, USA. Course funded and organized by the Foreign Agricultural Service of the United States Department of Agriculture.
45. Muthomi, J. W. Professionalism and Ethics in agricultural sciences. 20<sup>th</sup> August to 6<sup>th</sup> December 2012, University of Missouri-Columbia, USA.
46. Muthomi, J. W. Sanitary-phytosanitary and pest risk analysis training. 26<sup>th</sup> November to 1<sup>st</sup> December 2012 at the Centre for Regulatory Research LLC, USA.
47. Muthomi, J. W. Mycotoxins in foods. 7<sup>th</sup> September to 4<sup>th</sup> December 2012 at the University of Missouri-Columbia, USA.
48. Muthomi, J. W. Curriculum development. 28<sup>th</sup> September to 2<sup>nd</sup> December 2012 at the Centre for Collaboration and Development of Educational Innovations, University of Missouri-Columbia, USA
49. Onyango, C.M. Write-up workshop for development of full ASARECA proposal for the staple crops project on “validation of new disease resistant snap beans lines for adaptability, 29<sup>th</sup> October to 2<sup>nd</sup> November 2012., Mukono, Uganda.
50. Michieka R., The first international conference on pesticidal plants. Egerton University. 21<sup>st</sup> –24<sup>th</sup> January, 2013.
51. Njoroge K. Business Plan 2013-2018 of the Beca-ILRI Hub workshop from 10<sup>th</sup>-11<sup>th</sup> March 2013 at Dar-salaam, Tanzania, sponsored by ILRI/Syngenta Foundation.
52. Kimani P.M. Automated Monitoring Evaluation and Reporting (MER) System Workshop, in Entebbe, Uganda from 1<sup>st</sup> to 3<sup>rd</sup> April, 2013.
53. Kimani, P.M. ISSD International Workshop in Kumasi, Ghana, from 8<sup>th</sup> to 10<sup>th</sup> April, 2013.
54. Chemining'wa G.N., Kimani, P. M., Narla, R. D., Onyango, C.M The Inception Workshop of the ASARECA sponsored Snapbean breeding and integrated crop management projects, All Africa Conference of Churches – Bishop Desmond Tutu Centre, Nairobi, Kenya. 22<sup>nd</sup> to 23<sup>rd</sup> April 2013.
55. Chemining'wa G.N., Narla, R. D. The Regional workshop on Synthesis of Snap Bean Technologies, Validation Protocols, M&E, Capacity Building Needs and Communication and Management Strategy for the ASARECA



sponsored Snapbean Integrated Crop Management Project, All Africa Conference of Churches – Bishop Desmond Tutu Centre, Nairobi, Kenya. 24<sup>th</sup> to 26<sup>th</sup> April 2013.

56. Onyango, C.M. Building resilience through best practices in livelihood and food security in ASALs of Kenya. University Faculty Workshop, FAO/IIRR, 23<sup>rd</sup> to 26<sup>th</sup> April, 2013. Lukenya Gateway, Kenya.
57. Kilalo D., Plantwise (PW) Strategic Plan Finalization, meeting 23<sup>rd</sup> to 24<sup>th</sup> May 2013.
58. Onyango, C.M. Transformative Education, Research and Engagement for Dryland Resilience and Sustainability- Preparing the next generation for sustainability. 1st student led Conference, 29<sup>th</sup> to 30<sup>th</sup> May 2013. University of Nairobi, College of Agriculture and Veterinary Sciences, Nairobi, Kenya.
59. Michieka R. W. International Meeting of African Science Academies, (Sponsored by Rockefeller Foundation), Ballagio Centre, Italy, 3<sup>rd</sup> June to 7<sup>th</sup> June 2013.
60. Hutchinson, M., Follow-up meeting with ASARECA Trainees in Ethiopia. 23<sup>rd</sup> to 29<sup>th</sup> June 2013
61. Miano, D. VIRCA Project Biosafety Regulatory meeting. Protea Hotel, Kampala, Uganda. 27<sup>th</sup> June 2013.
62. Ambuko, J. Science Writing Skills Course 2 at Speke Resort, Uganda. 26<sup>th</sup> June to 2<sup>nd</sup> July 2013.

#### POSTGRADUATE STUDENTS GRADUATION: STUDENTS WHO GRADUATED IN 2012-2013

##### MSc Crop Protection

|   | Name                  | Registration no | Title of Thesis   | Supervisors   |
|---|-----------------------|-----------------|---|---|
| 1 | Ita Boniface Nyaga    | A56/76332/2009  | Assessing the effectiveness and benefits of conventional and minimum tillage on weed management in Maize ( <i>Zea mays</i> L.)  | Prof. R. Michieka<br>Dr. E. Ariga<br>Dr. M. Muiru                     |
| 2 | Koech Ann. Cheron     | A56/76432/2009  | Evaluation of Biopesticides and harvesting periods for management of potato tuber moth ( <i>Phthorimeaeopercullella</i> ) Zeller on Potato ( <i>Solanum tuberosum</i> ) | Prof. F. Olubayo<br>Prof. J. Nderitu<br>Mrs. D. Kilalo                |
| 3 | Were S. Aringo        | A56/76912/2009  | Occurrence of Potato Tuber Moth (Spp. Opercullella) and screening for tolerance in popularly grown varieties in Kenya   | Prof. F. Olubayo<br>Prof. J. Nderitu, Dr. D. Kabita and Dr. D. Kilalo |
| 4 | Weru Rose Wamaita     | A56/72737/2008  | Tolerance of maize varieties to infection by aspergillus flavus and its management by use of antagonistic microorganisms  | Prof. J. Muthomi<br>Prof. G. Chemining'wa<br>Prof. E. Mutitu          |
| 5 | Ngure Kimani          | A56/P/8501/2003 | The occurrence and intergrated management of cassava brown streak disease in coastal Kenya  | Prof. D. Mukunya<br>Dr. R. Muinga                                     |
| 6 | Nzesya Jane K. Maundu | A56/1042/2009   | Plant Parasitic Associated With Coffee In Kenya, Germplasm Response And Effect Of Nutrition On Tolerance To Nematode Damage"  | Prof. J. Kimenju<br>Dr. M. Muiru<br>Dr. E. Gichuru                    |

##### MSc Agricultural Resource Management

|   |                   |                |  |   |
|---|-------------------|----------------|--|---|
| 7 | Kamanu J. Kariuki | A56/76185/2009 | Effect of Inorganic fertilizer application regimes and rhizobium inoculation on growth, yield and quality of snap bean ( <i>Phaseolus vulgaris</i> L.) varieties in Central Kenya. | Prof. G. Cheminingwa<br>Prof. J. Nderitu<br>Dr. J. Ambuko |
|---|-------------------|----------------|--|---|

##### MSc Plant Breeding and Biotechnology

|   |               |                |  |                              |
|---|---------------|----------------|--|------------------------------|
| 8 | Kimani Wilson | A56/72263/2008 | Transferring drought tolerance of the stay-green trait in sorghum from | Dr. Ngugi<br>Prof. E. Mutitu |
|---|---------------|----------------|--|------------------------------|

|  |  |  |  |               |
|--|--|--|--|---------------|
|  |  |  | E36-1 an Ethiopian line into ochuti, a farmer preferred Kenyan variety | Dr. D. Kiambi |
|--|--|--|--|---------------|

### MSc Plant Breeding and Biotechnology

|    |                     |                |   |   |
|----|---------------------|----------------|---|---|
| 9  | Kaloki Peter Kioko  | A56/72086/2008 | Genetic variability and heritability of chickpea ( <i>Ciceraretinum</i> L.)   | Dr. E. Ngugi<br>Dr. S. Silim<br>Dr. M. Mburu  |
| 10 | Bigirimana Joseph   | A56/77624/2009 | Characterization of resistance to coffee leaf rust and coffee berry disease among Rwandese and associated coffee germplasm                  | Prof. K. Njoroge<br>Prof. J. Muthomi<br>Dr. D. Gahakwa<br>Dr. Noah A. Phiri<br>Dr. E.K. Gichuru |
| 11 | Niyibigira Theogene | A56/7890/2009  | Transferring of <i>Striga</i> Resistance QTLs from a Resistant Donor Source into Adapted Sorghum variety in Rwandan adapted sorghum variety | Dr. Ngugi<br>Prof. E. Mutitu<br>Dr. D. Kiambi   |

### MSc Horticulture

|    |                 |                |   |   |
|----|-----------------|----------------|---|---|
| 12 | Githiga W. Ruth | A56/77181/2009 | Effect of 1-Methylcyclopropene and Activebag® Packaging on the Postharvest characteristics of fruits                        | Dr. J. L. Ambuko<br>Prof. M. J. Hutchinson<br>Dr. W. O. Owino |
| 13 | Yumba P. Mueni  | A56/64875/2010 | Agro-ecological conditions affecting the postharvest quality of passion fruits and their response to postharvest treatment. | Dr. J. Ambuko<br>Prof. S. Shibairo<br>Dr. W. Owino            |

### MSc Plant Pathology

|    |                         |               |  |                                    |
|----|-------------------------|---------------|--|------------------------------------|
| 14 | Kigamwa Joseph<br>Ngilu | A56/7356/1994 | Cultural studies and assessment of seedborne inoculums of <i>Phyricularia grisea</i> (anamorph Magnaporthe grisea) on and in finger millet seed and its implication on blast incidence and severity. | Prof. A. Mwang'ombe<br>Prof. Mibey |
|----|-------------------------|---------------|--|------------------------------------|

### MSc Plant Breeding

|    |                          |  |   |   |
|----|--------------------------|--|---|---|
| 15 | Samuel Wanjohi<br>Wahome |  | Selection for multiple disease resistance and marketable pod characteristics in snap bean genotypes | Prof. P. M. Kimani<br>Prof. J. W. Muthomi<br>Prof. R.D. Narla |
|----|--------------------------|--|---|---|

### PhD

|   | Name               | Registration no | Program                         | Title of Thesis   | Supervisors   |
|---|--------------------|-----------------|---------------------------------|---|---|
| 1 | Karaya Githu Haron | A80/80099/2008  | PhD Plant Breeding and Genetics | Identification and Characterization of New Sources of Resistance to <i>Striga Hermonthica</i> among diverse maize germplasm.                                      | Prof. K. Njoroge<br>Prof. S. Ariga<br>Prof. J. Nderitu                      |
| 2 | Kilao C. Dora      | A80/80464/2010  | PhD Entomology                  | Molecular Detection of Viruses Associated with Passion Fruit ( <i>Passiflora edulis</i> ) woodiness disease, Monitoring and Management of Aphid Vectors in Kenya. | Prof. F. Olubayo<br>Prof. J. Kimenju<br>Prof. M. Hutchinson<br>Dr. E. Ateka |

## EXTERNAL EXAMINERS 2012/2013

|   | EXTERNAL EXAMINER          | DEPARTMENT                        | INSTITUTION         |
|---|----------------------------|-----------------------------------|---------------------|
| 1 | Prof. Stephen M. Githiri   | Plant Science and Crop Protection | JKUAT               |
| 2 | Prof. Isaiah M. Tabu       | Plant Science and Crop Protection | Egerton University  |
| 3 | Dr. Gohole Linnet Serenge  | Plant Science and Crop Protection | Moi University      |
| 4 | Prof. Ezekiel Kiprop       | Plant Science and Crop Protection | Moi University      |
| 5 | Dr. Edward Gachangi Njenga | Plant Science and Crop Protection | Kenyatta University |

## TREE PLANTING

Departmental staff and students participated in tree planting activities organized by the college at Kanyariri, Kibwezi and Field station as part of the efforts to enhance protection of the environment.

## PHOTO GALLERY



Department of Plant Science and Crop Protection Chief Technologist Mr. Joel Aura (with a water bottle) ready to plant an indigenous tree seedling on May 3, 2013 at Ngong.



College management board tour of SEMIs Bean Seed Project at Kibwezi in August 2013, led By CAVS Principal Prof. Agnes Mwang'ombe (middle with a hat)





Seed Bean crop in Kibwezi field Station-August 2013



M.Sc. Agricultural Resource Management and M.Sc. Horticulture students on orientation in 2013



Dr. Pauline Aluka (centre) posing for a photo with Anne Thuita (left, MSc student) and Mike Maobe (Senior Technologist) after graduating with PhD in Genetics and Plant Breeding



Mary Ndegwa (Technologist, Horticulture) assisting with secretarial work in the Department



Prof. James Muthomi (standing) giving advice to new ODL MSc students in 2013





Prof. George Chemining'wa (in glasses), Prof. Kisia (Centre) and Dr. Mugivane listening to speeches by guests during RRI tree planting event in 2013



Prof. Margaret Hutchinson (standing) giving a speech during the launch of ODL MSc Agricultural Resource Management





Participatory farmer technology selection exercise conducted at Mwea in 2013 by the ASARECA snap bean Integrated Crop Management Project implemented by UoN



Dr. Josiah Kinama (the middle) with colleagues welcoming a guest during an exhibition event by the University of Nairobi



Prof. P.M. Kimani (Head of Plant Breeding Unit) facilitating at workshop