# SPGRC

SADC Plant Genetic Resources Centre

# Twenty Third Annual Report
# 2012/2013

SPGRC
Lusaka, Zambia
2013

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## Abbreviations

| | |
|---|---|
| **ABCIC** | African Biodiversity Conservation and Innovations Centre |
| **AIMS** | Agricultural Information Management System, SADC |
| **ARC** | Agricultural Research Council, South Africa |
| **BioFISA** | Finnish-Southern Africa Partnership Programme to Strengthen NEPAD/ SANBio Network |
| **CTA** | Technical Centre for Agricultural and Rural Cooperation |
| **CGIAR** | Consultative Group of International Agricultural Research |
| **DRC** | Democratic Republic of Congo |
| **EMBRAPA** | *Empresa Brasileira de Pesquisa Agropecuária* (Brazilian Agricultural Research Corporation) |
| **FAO** | Food and Agriculture Organisation (United Nations) |
| **GCDT** | Global Crop Diversity Trust |
| **ICT** | Information and Communication Technology |
| **INERA** | *Institut National pour l'Etude et la Recherche Agronomiques* (National Institute for Agronomic Study and Research), DRC |
| **ISTT** | In-Service Training Trust, Zambia |
| **LAN** | Local Area Network |
| **NPGRC** | National Plant Genetic Resources Centre |
| **NPGRCom** | National Plant Genetic Resources Committee |
| **PGR** | Plant Genetic Resource |
| **PGRFA** | Plant Genetic Resources for Food and Agriculture |
| **RCWG** | Regional Crop Working Group |
| **SADC** | Southern African Development Community |
| **SANBio** | Southern African Network for Biosciences |
| **SDIS** | SPGRC Documentation and Information System |
| **Sida** | Swedish International Development Co-operation Agency |
| **SPGRC** | SADC Plant Genetic Resources Centre |
| **SPO** | Senior Programme Officer, SADC |
| **TCP** | Technical Cooperation Programme |
| **TEEAL** | The Essential Electronic Agricultural Library |
| **UNZA** | University of Zambia |
| **VPN** | Virtual Private Network |
| **ZCAS** | Zambia Centre for Accountancy Studies |
| **ZESCO** | Zambia Electricity Supply Company |

## Report Highlights

- 29th SPGRC Ordinary Board Meeting Held in Lusaka, Zambia
- Technical Review and Planning meeting in Lusaka, Zambia
- General Discussions from planning meeting
- FAO-TCP Support for Development of Conservation Strategies

# 1 MANAGEMENT AND ADMINISTRATION

## 1.1 The 29th Ordinary Board Meeting Held in Lusaka, Zambia

The 29th SPGRC Board meeting was held in Lusaka, Zambia on 26th – 27th September 2013. On behalf of the Permanent Secretary in the Ministry of Agriculture and Livestock, the meeting proceeding was officiated by Mr Julius Shawa, a Director in the same ministry. He welcomed Board Members to Zambia and wished them successful deliberations and a happy stay in Lusaka.

The Chairperson, Dr Julian Jaftha in his opening remarks, conveyed heartfelt condolences to the people of the Republic of Zambia for the passing on of Mama Betty Kaunda, wife of the former Republican President, Dr Kenneth Kaunda. He then welcomed the Board Members to its 29th meeting. He cautioned members to be ready to contribute to towards food security of their respective countries in the wake of global warming. He encouraged the Board to continue interacting with SPGRC to assist it in its endeavours throughout the year and not only during the Board meeting.

*Group photo: SPGRC Board 2012*

Following delivery of welcome remarks by the Zambian Board member, Mr Godfrey Mwila, the Director of FANR, Mrs Margaret Nyirenda expressed happiness for attending the Board Meeting once again and thanked the Government of Zambia for supporting SPGRC. She reminded Board Members that the SADC Secretariat was also affected by the global financial crisis and as a result, its budgets have been static for the past three (3) years. She thus urged SPGRC to try and get out of the dependence situation for its sustainability, with the assistance of the Board in mobilisation of resources.

## 1.2 Workshops and Meetings

### 1.2.1 Annual Technical Review and Planning Meeting

The regional stakeholders' meeting on information exchange of national strategies on PGRFA was held on 10th – 13th September 2012, at Protea Hotel – Cairo Road in Lusaka, Zambia.

The meeting brought together representatives from all SADC Member States (NPGRCs) with the objective to:

- initiate planning and implementation of the FAO-funded project that would see national strategies for PGRFA developed for selected SADC countries;

- review the implementation of the technical activities for 2011/2012 cropping season;
- evaluate the technical and budgetary plans for the 2012/2013 cropping season; and
- facilitate information sharing on any other technical and networking issues.

In attendance were twenty eight (28) participants from NPGRCs, SPGRC, FAO, and ABCIC.

On the first day (10th September 2012) the Project task Force comprising of the SPGRC Head, Regional Project Coordinator, a Consultant and FAO representatives met. The remaining days were dedicated to purely core network activities, including planning for implementation of the FAO-TCP project.

In his opening remarks, the Head of SPGRC was happy that SPGRC has been able to hold such a meeting after the ending of funding by Nordic, thanks to SPGRC's own efforts and the generous funding by FAO. He acknowledged and thanked the presence of strong FAO delegation and that of ABCIC as consultants. He welcomed back Mr Godfrey Mwila, a senior officer from Zambian NPGRC who was away for a few years working with the Global Crop Diversity Trust.

Despite many challenges, the Head outlined some of the major achievements scored during the reporting time. These include successful conclusion of the GCDT funded regeneration project and safety duplication of materials to CGIAR centres in 2011; completion of the non-binding regional PGR policy guidelines with funding from SANBio; preparation of the 5th Phase completion report; updating of the SPGRC long-term sustainability plan; development and submission of two competitive project proposals for possible funding by donors; and programme development for the FAO-TCP project aimed at developing national PGRFA conservation strategies for selected SADC Member States.

*Delegates' group photo: Planning meeting 2012*

In his remarks during the opening session, the Zambia Country FAO Representative, Mr Ad Spijkers expressed his gratitude for being invited to the meeting and also for FAO having opportunity to work with SPGRC network through a TCP that he confirmed was recently signed. He

urged the network to strive to be in the forefront for raising agricultural productivity in the region. His experience in Asia tells the potential for Africa as having room for improved productivity.

Mr Spijkers reminded the meeting that FAO was not a funding agency but a technical facilitator to support countries improve agriculture in areas that include soil fertility, land, water, labour, seed, marketing, *etc*. He revealed that Africa is the next basket of food and therefore with the application of existing and appropriate knowledge and technology, average production could increase 2-3 folds.

In addition to the routine discussions and deliberations on conventional SPGRC network activities, the meeting also discussed status and challenges faced by NPGRCs in hosting NPGRComs, and reasons for little uptake of on-farm/in-situ activities in the countries. It also explored reasons for inconsistent sending of materials to the base for conservation, potential for use of solar energy in conservation, role of SPGRC in multilateral systems, and issues of domestication of the Treaty.

### 1.2.2 Regional Crop Working Groups

No Regional Crop Working Groups (RCWGs) meetings were held during the reporting period due to financial constraints. The outputs from previous meetings continued to be used in the implementation of strategies for collection and conservation of plant genetic resources of various species groups.

### 1.3 Visitors

During the reporting period, SPGRC received many visitors including school pupils, university students, scientists, farmers and prominent individuals. These are listed in the Appendix III.

## 2. PERSONNEL, EQUIPMENT AND SUPPLIES

### 2.1 SPGRC Personnel

The staff compliment at SPGRC changed with the resignation of the former Technical Officer – Documentation & Information, Mr Kennedy Hamudulu in October 2011. He was replaced by Mr Mike Daka who took over from 21st May 2012 through a competitive recruitment process.

Mr. **Mike Daka** joined SPGRC on 21st May 2012 to fill the post of Technical Officer – Documentation &

Information. He has a vast technical background in handling ICT related issues at many levels which he has been doing for the past 5 years. He has previously worked as an Assistant IT Technician for the Zambia Centre for Accountancy Studies (ZCAS), one of the largest higher learning institutions in Zambia. He has also worked as a part-time ICT Consultant/Technician with the Ministry of Education in Luanshya on the Copperbelt Province of Zambia where he contributed in supporting and developing growth of their ICT infrastructure. He holds a BSc in Computing, an Advanced Diploma in Computer Studies majoring in Internet systems and a Diploma in Information Systems.

## 2.2 Staffing in NPGRCs

The meeting was informed of the return of Ms Domingas Tomás in April 2012 following successful completion of 2 years MSc course in Brazil. An abstract of her thesis work is on *in-situ*/on farm conservation. Mr Godfrey Mwila from Zambia returned after service with the Global Crop Development Trust in Rome, Italy.

The DRC staffing for the newly established NPGRC were reported as Professor Mbikayi Nkonko –Director Scientific Research at INERA, Mr Ramazani Lumbe – Head of Division Management of Genetic Resources, and Program Chiefs at respective Research Centres across the country.

It was reported that a long-serving *In-Situ* Conservation officer for Lesotho was appointed to a higher position in the Ministry of Agriculture; whereas, Tanzania reported to have recruited one field officer with BSc, Ms Getrude Kanyairita.

Mauritius reported that there had been changes in staffing in the past two years and has Mr K. S. Ramsurrun as the head of the Genebank of Mauritius.

The year 2012 was considered as the inception year for Seychelles NPGRC. The NPGRC's budget of Rs. 4.1 million (approx. US$ 327,400) were secured for the construction of the new Soil Laboratory which once completed will create space for the setting up of the NPGRC in the infrastructure currently being used by the Soil Laboratory.

Lastly, the meeting was informed that Drs Dickson Ng'uni and Claid Mujaju from Zambia and Zimbabwe respectively returned to their respective countries after successful completion of their doctoral studies and that at the time of the meeting, they were both in South Africa doing their post-doctorate studies.

## 2.3 Equipment and Supplies

Frequent power outages from the State utility company (ZESCO) continued causing damage to some equipment in the genebank. The standby generator as reported earlier on is very old and need either a major overhaul or preferably, replacement. A new standby generator will be procured during the current financial year with funds from FAO-TCP project.

Through FAO-TCP funding, SPGRC also plans to procure a new heavy-duty photocopier to replace the ageing one which has become expensive to maintain.

The established NPGRC for DRC is reported to have secured an office and a faulty desktop computer at INERA in Kinshasa. As a result of joining the network late, DRC has not received any kind of equipment support and was therefore asking for SPGRC to enable it start up activities.

Rehabilitation of the Swaziland NPGRC building was reported as completed. The standby electric generator set, though connected in 2011 was for a long time not running because of a failing fuel pump was now reported to be working.

### 1.4 SPGRC Buildings (Offices and Staff Houses)

There has been no change in status during the year under review. SPGRC continued to pay heavily for frequent and expensive maintenance of office buildings and staff houses mainly due to initial poor workmanship, for example poor plumbing materials used. Major maintenance work on buildings including replacement of substandard materials is required to solve the problem of frequent breakdowns of infrastructure once and for all.

## 3. MEETINGS, TRAINING AND EDUCATION

### 3.1 Training and Education for NPGRC Staff

The traditional annual PGR Management Short Course could not take place during the reporting period due to financial constraints. However, there is window for conducting such or related course during the implementation of FAO-TCP in the coming 1½ years.

Angolan NPGRC reported that it was preparing for a training course in pre-characterization for agronomists and middle-level technicians in October 2012, with participation of two specialists from EMBRAPA, Brazil. Meanwhile, there were preparations going on for an MSc course in PGR Conservation and Utilization to be held at Agostinho Neto University in 2013.

A number of network scientists are pursuing postgraduate studies in PGR management at different universities. Mr Lawrent Pungulani from Malawi and Ms Sonja Loots from Namibia are studying for PhD in New Zealand and Sweden respectively.

While Ms Nolipher Khaki from Malawi and Mr. Abilio Virissimo Afonso from Mozambique continued with their MSc programmes in Uganda and Sweden respectively, Tanzanian Mr. E. Mausa and Mr. S. Mungure are attending MSc. level training in Biotechnology and Laboratory Sciences at Sokoine University of Agriculture in Morogoro, Tanzania.

Ms Remmie Moses from Namibian NPGRC is scheduled to complete her Honours in Plant Sciences (University of Pretoria) early in 2013. The Namibian NPGRC conducted on-job training to B. Alweendo on germination test of pearl millet.

While South Africa's Mr Percy Moila is pursuing MSc in Sustainable Agriculture at Free State University, Ms Jermina Moeaha is doing MSc. in conservation, and Ms Maluleke a BSc Honours degree.

Mozambican Mr Francisco Reis is pursuing his BSc. Hons. in Agronomy at the Polytechnic Institute in Maputo. Two research officers from Zimbabwe, Ms Fungai Chinosengwa and Mr Onismus Chipfunde are pursuing their MSc degrees South Africa and Zimbabwe respectively. One research officer, Mr Peter Mavindidze returned after successfully completing a BSc degree programme in Zimbabwe.

There was a general outcry from all NPGRCs for lack of funding for short courses and long term training for Gene bank staff.

### 3.2 FAO-TCP Project Training

The SPGRC conducted a two-weeks training in breeding and molecular characterization from 17th February to 1st March 2013 at the University of Zambia (UNZA) in Lusaka.

The course, aimed at enhancing the capacity of the SPGRC/NPGRC personnel to improve the utilization of plant genetic resources in the genebanks covered among other areas, molecular characterization, pre-breeding, seed quality control, certification and seed policy.

*Group photo: FAO-TCP trainees, 2013*

Attended by 13 participants from the six FAO-TCP participating countries of Botswana, Malawi, Mozambique, Lesotho, Tanzania, and Zambia; the course was delivered by UNZA lecturers (see project background on item 7).

### 3.3 MSc Training in PGR Policy

With sponsorship from the SANBio/BIOFISA project being coordinated by the SADC Plant Genetic Resources Centre (SPGRC), Mr Onismus Chipfunde from Zimbabwean NPGRC was pursuing an 18-month MSc studies in Environmental Policy and Planning on a full time basis at the University of Zimbabwe from January 2012.

Mr Chipfunde will do his research work and write thesis from January 2013 and is expected to graduate in June 2013.

### 3.4 Training of SPGRC Staff

Most SPGRC senior officers had an opportunity to attend a short training on Web 2.0 tools and social media applications conducted at the In-Service Training Trust (ISTT) in Lusaka, Zambia with generous funding from the Technical Centre for Agricultural and Rural Development EU-ACP (CTA).

The training covered advanced online searching, getting information served via alerts and RSS, collaborating remotely using wikis and Google Docs, using VoIP, online mapping and social networking. Participants got hands-on experience on how to use innovative applications, and assessed how they could adopt these innovations within the context of their work and organisation. This Learning Opportunity forms part of CTA initiatives that support development partners in networking, accessing and disseminating information more effectively.

### 3.5 PGR Policy Guidelines Development

The guidelines have now been finalized and translated into French and Portuguese ready for presentation to the Ministers. They will later be printed and distributed widely to stakeholders in SADC region and beyond.

### 3.6 Some Important Meetings Attended by SPGRC Staff

**Table 3.1: Meetings attended by SPGRC Staff**

| | |
|---|---|
| Apr 2012 | – The Head, SPOs Documentation & Information, *Ex-situ* and *in-situ* were on working retreat to finalize SADC policy guidelines for PGRFA, Livingstone, Zambia |
| May 2012 | – SPO Documentation & Information travelled on a peer-to-peer learning visit to Medical Research Institute and International Centre for Genetic Engineering and Biotechnology under SANBio, Cape Town, South Africa |
| June 2012 | – SPO *In-situ* undertook a backstopping trip on conservation of root and tuber crops in Mozambique<br>– The Head travelled to Johannesburg (South Africa) for consultations with the Board Chairperson |

| | |
|---|---|
| July 2012 | – The Head attended the SADC Finance Sub-Committee meeting in Gaborone, Botswana<br>– The Head travelled to Gaborone (Botswana) for consultations with the FANR Director<br>– SPO Documentation & Information travelled on a consultative mission for authentication of SDIS central server at SADC Secretariat, Botswana<br>– SPO *Ex-situ* Conservation travelled to Mauritius on a technical backstopping mission<br>– SPO *In-situ* backstopped Seychelles on the 'every home a garden' concept |
| Aug 2012 | – The Head attended the Council of Ministers meeting in Maputo, Mozambique |
| Sept 2012 | – SPO Documentation & Information and SPGRC Head travelled to attend the BioFISA/SANBio Phase I closure conference and planning for Phase II, Pretoria, South Africa |
| Oct 2012 | – The Head attended the Mzimba Open Day on plant genetic resources in Malawi |
| Nov 2012 | – The Head attended the Natural Resources Management Leaders' workshop held in South Africa<br>– SPO *Ex-Situ* travelled to Arusha-Tanzania to carry out genebank evaluation for compliance to international standards<br>– SPO *Ex-Situ* travelled to Pretoria, South Africa to carry out genebank evaluation for compliance to international standards |
| Dec 2012 | – The Head travelled to Gaborone (Botswana) for consultations with CARDESSA management and attended the SADC Finance Sub-Committee<br>– SPO Documentation & Information travelled to Gaborone, Botswana to consult and work with SADC-AIMS programmer to develop the web-based SDIS<br>– SPO *Ex-Situ* attended the 2nd SADC Seed Centre 2nd Steering Committee meeting, Harare, Zimbabwe |
| Jan 2013 | |
| Feb 2013 | – The Head attended the Council of Ministers' meeting in Maputo, Mozambique<br>– SPO *Ex-Situ* travelled to Arusha-Tanzania to carry out genebank evaluation for compliance to international standards |
| Mar 2013 | – SPO *In situ* undertook a training mission on germplasm collection in DRC<br>– SPO Documentation & Information undertook a backstopping mission to Malawian NPGRC, Lilongwe, Malawi |

# 4. TECHNICAL ACTIVITIES

## 4.1 GERMPLASM COLLECTING AND *IN SITU* CONSERVATION

### 4.1.1 Germplasm Collection

Germplasm collection missions were conducted in nine countries (last year - six countries). A total of 902 samples of crops and wild species were collected including *Vigna* wild crop relatives in Tanzania. Last year, 836 samples were collected. Figures for 2012 collected samples are reflected in Table 4.1.

**Table 4.1: Germplasm Collections in the 2011/12 season**

| Country | Number of Samples | Remarks |
|---|---|---|
| Angola | 268 | Mixed crops |
| Botswana | 37 | Mixed crops |
| Lesotho | 2 | Wild sp. |
| Namibia | 39 | Wild sp. |
| South Africa | 246 | Multi-crop, breeders seed |
| Swaziland | 8 | Mixed crops |
| Tanzania | 25 | Wild *Vigna* |
| Zambia | 277 | African leafy vegetables |
| **Totals** | **902** | |

### 4.1.2 Conservation of Wild Fruits and Medicinal Plants at SPGRC

SPGRC continues to maintain wild fruit trees and medicinal plant species. NPGRCs maintain live collections of root and tuber crops in field gene banks and at the national centres or in specialized institutions.

### 4.1.3 On-Farm Conservation

**Table 4.2: Status of On-Farm Conservation**

| Country | Progress | Plan 2012/13 |
|---|---|---|
| Botswana | – Conservation activities continuing | – Activities continuing at Serowe |
| Lesotho | | – Assess challenges/resistance of the uptake of on-farm conservation by farmers |

| | | |
|---|---|---|
| Malawi | – Selection of best/ preferred Finger Millet and other local varieties for seed production and commercialization under formal seed systems done<br>– Strengthening of Community Seed Banks on-going.<br>– Bambara promotion in collaboration with Bunda College ongoing. | – Continue with promotion of finger millet production<br>– Bambara promotion sites: Chisi (50 farmers), Mzimba (75 farmers) to be established |
| Namibia | – Material multiplied, and threatened material restored to farmers on request. | – Activity to be rolled out to other communities |
| Seychelles | – A demonstration garden established and activity to be rolled out within the country. | – Planting materials distributed to farmers to encourage crop diversity in the home gardens |
| Swaziland | – Conservation through use strengthened. | – Traditional crop diversity to be promoted in collaboration with the Conservation Agriculture Project |
| Tanzania | – Characterization of trials done.<br>– Establishment of a Community Seed Bank pending.<br>– Crop Diversity Fairs carried out in Morogoro, Dodoma, Mtwara | – On-farm activities to be strengthened |
| South Africa | – Farmers multiplied maize, pearl millet, pumpkin, calabash, cowpea, groundnuts in KwaZulu Natal | – Continue engaging farmers to multiply crops on behalf of the NPGRC |

| | | |
|---|---|---|
| Zambia | – Awareness raising on the importance of conservation continued.<br>– Training participating farmers on sustainable farming practices, utilization of crops for different purposes done.<br>– Crop Diversity fairs conducted at Mamvule, Rufunsa and Nadezwe | – Farmers to be trained on seed management/storage and marketing;<br>– On-farm conservation activities to be continued |
| Zimbabwe | – Restoration of genebank accessions targeting communities continued, | – Restoration of threatened crops to be continued |

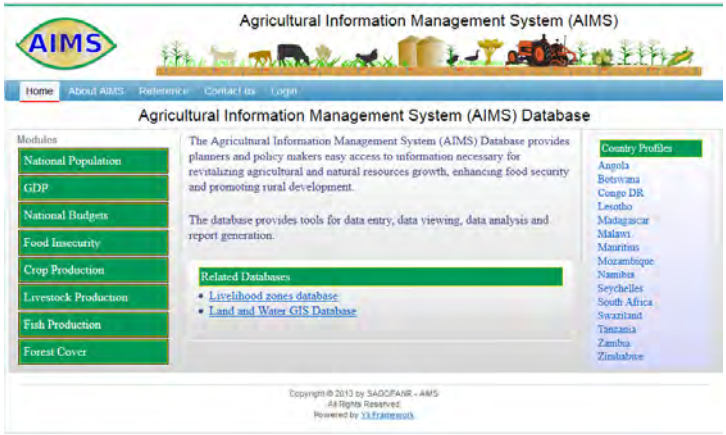
## 4.2 DOCUMENTATION AND INFORMATION

### 4.2.1 Hardware and Software

As a routine, SPGRC updated its software (applications, antivirus) during the reporting period. It was also in the process of procuring, configuring and installing a server for the LAN to replace the old one.

### 4.2.2 Database Development

Development of the web-based SDIS from a stand-alone window based system did not progress well as envisaged. The




*SADC-AIMS Portal where SDIS will be duly posted*

web-based system required Internet access and the SPGRC project funded by Sida built Local Area Networks (LANs) for the countries, and acquired and installed database servers for the same, as well facilitated Internet subscriptions.

The central synchronizing server, designated to control and monitor the network servers through a Virtual Private Network (VPN) environment was acquired, configured and installed in Sweden. It was only transferred to the SADC Secretariat in December 2011 but came without documentation and access codes.

Upon authentication by a SADC Technical Team, the server was found to be old and only partially installed with an operating system. It had its root login disabled. The machine had no installed applications, no Apache found, and no history of the author's activities was found, implying the machine was idle. There were no web servers and no web applications found on the machine. There were no routing table entries on the server that are meant to facilitate communication with the Member State servers.

SPGRC is currently working with the SADC- AIMS programmer to put the SDIS database on the web as planned. A detailed workplan will be developed by the two and resources found to further develop the web-based SDIS. Part of the FAO-TCP funds has been allocated to leverage this activity.

### 4.2.3 Information

#### 5.2.3.1 Network News

The SPGRC annual report for 2011/2012 was published and distributed together with the January-December 2011 SPGRC Newsletter. The two, together with other SPGRC publications have been uploaded to the corporate website (www.spgrc.org.zm) and stakeholders are urged to access them online so that in future, SPGRC reduces printing costs.

Publishing of the newsletter has not been consistent due to lack of articles from scientists. This was specially discussed during the planning meeting and scientists promised to send in articles for publishing.

#### 4.2.3.2 Connectivity to the Internet

To date, DRC, Mozambique, Seychelles, Tanzania, and Zimbabwe remain unreliably connected to the Internet and extra support is needed, especially in the anticipation of the operationalization of the web-based SDIS.

Seychelles need support to build a LAN and annual Internet subscriptions needed for DRC, Mozambique, Seychelles, and Tanzania.

#### 4.2.3.3 Publicity and Awareness of SPGRC

Little publicity was done to enhance SPGRC visibility due to financial constraints that the organisation faced in the year. As a result, SPGRC could not be represented to the Zambian International Trade Fair and at the National Agricultural show where it presents itself to stakeholders.

### 4.2.4 Library Services

SPGRC continued to purchase new books, and journal and serial titles as well as other publications while renewing the existing ones. Four new titles related to biodiversity management were purchased and added to the library collections that serve network scientists to keep themselves abreast with new information, technology and other developments in PGR management.

The SPGRC Network scientists continued to use The Essential Electronic Agricultural Library (TEEAL) facility that was acquired last year by SPGRC. Scientists have access to full-text and searchable database of articles from over 200 top scientific research journals in agriculture and related sciences spanning several years.

Scientists are encouraged to send in requests for full-text articles on subject of their interest. SPGRC will do search on the TEEAL, download selected articles and send them to scientists, at most, within 12 working hours.

### 4.2.5 Support to NPGRCs

Due to limited funding, staff from the Section could not travel to support all NPGRCs that asked for assistance. However, Botswana, Malawi, and Tanzania were technically assisted during the reporting period.

## 4.3 *EX-SITU* CONSERVATION

### 4.3.1 Seed Handling and Storage

While all other things were carried out successfully, the key among challenges the network set to promote this year was the implementation of an obligation the network set itself in 2007, to bridge the gap that had accumulated in previous years between collections held in Member States as 'Active' and at SPGRC as 'Base' collection.

Member States that scaled up efforts and sent duplicate backup collections to SPGRC were the following NPGRCs as follows: 45 from Angola, 309 Botswana, 13 Malawi, 38 Mauritius and 72 from Tanzania.

**Table 4.3: Accessions received from NPGRCs during 2012 – 2013**

| Country | Number of Accessions | Date Received |
|---|---|---|
| Angola | 45 | 13/09/2012 |
| Botswana | 309 | 16/10/2012 |
| DRC | 0 | - |
| Lesotho | 0 | - |
| Malawi | 13 | 13/09/2012 |
| Mauritius | 38 | 13/09/2012 |
| Mozambique | 0 | - |
| Namibia | 0 | - |
| Seychelles | 0 | - |
| South Africa | 0 | - |
| Swaziland | 0 | - |
| Tanzania | 72 | 13/09/2012 |
| Zambia | 0 | - |
| Zimbabwe | 0 | - |
| | 464 | - |

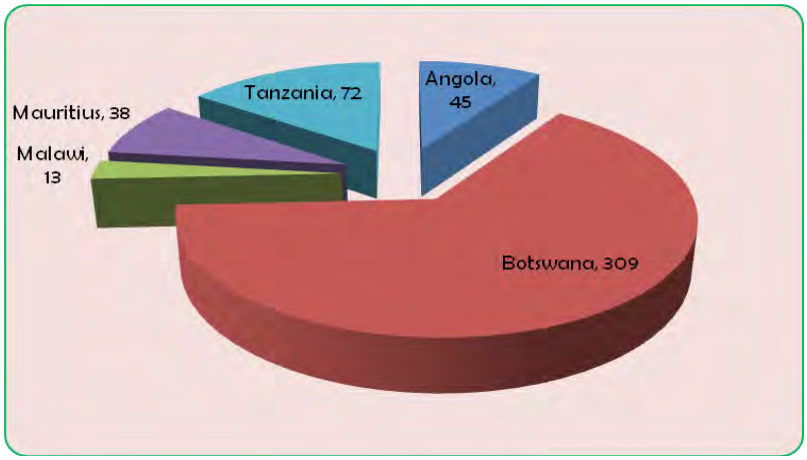



*Figure 4.1: Number of accessions received from NPGRCs in 2012*

### 4.3.2 Facilities and Equipment

Most of facilities and equipment which under the SADC regulations and Procurement Manual were considered old and were indeed not replaced as planned due to unusual financial challenges. A Freezer-Asset-Specific study conducted at SPGRC by SPO Ex-Situ Conservation aimed to find out the minimum budget SPGRC need annually to replace genebank freezers revealed gave a new light. In order to operate effectively and in compliance with SADC Regulations and Procurement Manual "Revised - August 2006", the minimum funds SPGRC needs annually is $20,500 for replacement of freezers only.

### 4.3.3 Regeneration and Multiplication

Multiplication of PGR materials that were received in small quantities from NPGRCs were multiplied at SPGRC experiment station as follows: 101 groundnuts, 40 maize and 30 beans.

The South Africa NPGRC in collaboration with the Agricultural Research Council: Grain Crops Institute (ARC: GCI) have multiplied: bean, maize, bambara nuts, sorghum, melons, calabash and pumpkins. In part to address the requirements of the obligation the network set itself in 2007, work was in progress in preparation of backup collection to be sent to SPGRC for long-term conservation. Materials multiplied in Tanzania were sent to SPGRC for backup conservation. Preparations are also underway in Swaziland to send materials to SPGRC for long-term conservation.

**Table 4.4: Status of collection: 2011 – 2012**

| Country | Collections in Country | Collection held at SPGRC |
|---|---|---|
| Angola | 4,281 | 1385 |
| Botswana | 4480 | 1052 |
| DRC | 0 | 0 |
| Lesotho | 1519 | 1201 |
| Malawi | 3917 | 1784 |
| Mauritius | 4613 | 1418 |
| Mozambique | 491 | 132 |
| Namibia | 2619 | 590 |
| Seychelles | 0 | 0 |
| South Africa | 3091 | 1108 |
| Swaziland | 972 | 483 |
| Tanzania | 6001 | 2240 |
| Zambia | 6500 | 3380 |
| Zimbabwe | 6311 | 2133 |
| | **44,795** | **16,906** |

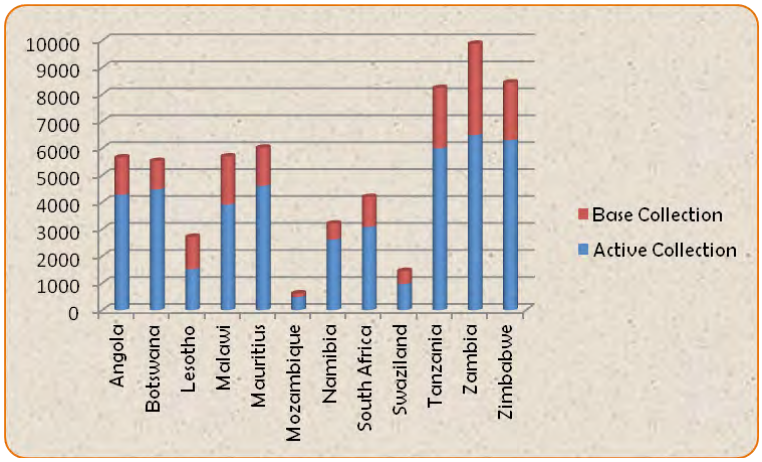



***Figure 4.2: Number of accessions by country at SPGRC***

During the reporting period, the accessions holdings and major species at SPGRC are as shown in tables 4.5 and 4.6 below.

**Table 4.5: Accessions of Major Species held at SPGRC**

| Species | Common Name | Number of Accessions |
|---|---|---|
| *Sorghum bicolor* (L.) Moench | Sorghum | 5133 |
| *Eleusine coracana* | Finger Millet | 1161 |
| *Zea mays* L. | Maize | 2210 |
| *Pennisetum glaucum* (L.) R. Br. | Pearl Millet | 1617 |
| *Vigna unguiculata* (L.) Walp. | Cowpea | 1362 |
| *Arachis hypogaea* L. | Groundnut | 789 |
| *Phaseolus vugaris* L. | Beans | 1132 |
| *Oryza sativa* L. | Rice | 335 |
| *Vigna subterranea* (L.) Verdc. | Bambara Nuts | 395 |
| *Cucurbits (C. Pepo & maxima)* | Pumpkin | 364 |
| *Citrullus lanatus* (Thumb.) Matsumura & Nakai | Water Melon | 217 |
| *Triticum aestivum* L. | Wheat | 142 |
| *Cajanus cajan* (L.) Millsp. | Pigeon pea | 172 |
| *Cicer arientinum* L. | Chickpea | 145 |
| *Pisum sativum* L. | Pea | 106 |
| *Sesamum indicum* L. | Sesame | 101 |
| *L. siceraria* | Gourd | 1121 |
| Others | | 88 |
| **Total** | | **16,590** |

**Table 4.6: Accessions of major species – SPGRC**

| Species | Common Name | Number of Accessions |
|---|---|---|
| *Sorghum bicolor* (L.) Moench | Sorghum | 4,482 |
| *Eleusine coracana* | Finger millet | 1,129 |
| *Zea mays* L. | Maize | 2,215 |
| *Pennisetum glaucum* (L.) R. Br. | Pearl millet | 1,563 |
| *Vigna unguiculata* (L.) Walp. | Cowpea | 1,076 |
| *Arachis hypogaea* L. | Groundnut | 778 |
| *Phaseolus vugaris* L. | Beans | 1,050 |
| *Oryza sativa* L. | Rice | 335 |
| *Vigna subterranea* (L.) Verdc. Ssp. | Bambara nut | 378 |
| *Cucurbits (C. Pepo & maxima)* | Pumpkin | 385 |
| *Citrullus lanatus* (Thumb.) Matsumura & Nakai | Water melon | 265 |
| *Triticum aestivum* L. | Wheat | 142 |
| *Cajanus cajan* (L.) Millsp. | Pigeon pea | 172 |
| *Cicer arientinum* L. | Chickpea | 144 |
| *Pisum sativum* L. | Pea | 106 |
| *Oryza Longistaminata* A. Chev. & Roehr. | Wild rice | 55 |
| *Sesamum indicum* L. | Sesame | 102 |
| *L. siceraria* | Gourd | 113 |
| Others | Others | 1,943 |
| **Total** | | **16,433** |

### 4.3.3 Coordination and Technical Back-up

During the report period, coordination and technical backstopping missions were made to Mauritius and Mozambique and specific evidence based evaluations were made to South Africa, Botswana and Tanzania.

## 5. FARM

Farming activities for the 2012/13 cropping season had to be deferred to the next season due to the delayed procurement of a tractor and financial limitations. The new tractor has since been procured though this happened late in the farming season.

## 6. GENERAL ISSUES: DISCUSSIONS AT PLANNING MEETING

### 6.1 Reasons for little uptake of on-farm/*in-situ* conservation

Despite substantial efforts to step-up establishment and development of on-farm/*in-situ* activities, there has been little uptake as reported by the countries. The meeting was asked to ponder reasons as to what could be the cause.

After long discussions, the network was advised to do research for regional uptake of on-farm/*in-situ* by reviewing successes and failures achieved over the years, and assess the potential for the same. A commissioned study was proposed to undertake this.

While the meeting was advised to find possibilities of advancing on-farm market *niche*s, they should also strive to conserve *ex-situ* materials for future use. Extensive urbanization is engulfing Africa and soon there will be a very small proportion of farming communities that will feed the rest of the population in towns using inorganic materials (seeds, fertilizers, extensive land cultivation methods). Consumers will turn to organic foods whose answer lies in PGR.

The meeting also advocated for repatriation of crop landraces back to farmers, raising awareness on the benefits/advantages of on-farm/*in-situ* conservation and continue with efforts to sell a prepared proposal by SPGRC on the same to potential donors for funding.

### 6.2 Inconsistence in dispatch of germplasm materials to SPGRC for base conservation

It was emphasized during the meeting that sending the country materials for back up at SPGRC base collection is a no-choice and should be taken seriously to save the seeds from any possible mishap at the national genebanks. It is important to utilize the facility that is funded by the SADC Member States.

Clarifying, the SPO – *Ex-situ* Conservation asked the Curators to submit to SPGRC for base collection 1500 seeds, of which, 500 go to base, 500 for testing, and remaining is duplicated for safety to Svalbard Global Seed Vault. Should a country send unprocessed seed, then it should add another 500 seeds (making it 2 000 seeds) that will be used for testing.

### 6.3 Use of solar power for back ups

There was a proposal that given the erratic power supply in a number of countries in the region, NPGRCs could start thinking use of abundant solar power even though its initial capital is high, it becomes cheap in the long run if compared to costs involved in running standby generators.

The meeting agreed that a feasibility study needs to be done to explore use of solar to power genebanks. Since Lesotho had started exploring, it was requested to share findings through SPO – *Ex-Situ* Conservation.

Seychelles promised to share its experience whereby individuals generate solar power excess of which they sell to the national grid and get compensated.

### 6.4 Domestication of the Treaty

It was reported that funds that were available for awareness raising were exhausted and that SPGRC was trying to source other means of funding.

The SPGRC management was advised to resuscitate its relations with the Treaty Secretariat and see if there is possibility for them to provide funds for domestication in the region. SPGRC was advised to write a letter/email to this effect.

### 6.5 Characterization and utilization of germplasm

While characterization was considered important in unveiling crop traits that users (breeders, farmers) look for in any crop development programme, NPGRCs were encouraged to step up characterization and share outcomes so that collected and conserved materials find relevance and importance for the policy makers to support our course of work.

Countries doing morphological characterization might have data which breeders see it insufficient for their work, so molecular characterization seem to be the way and countries should strive to join the bandwagon.

In order to holistically address the producer-user gap, it will be advisable to involve breeders in characterization as well as evaluation after characterization.

## 7. FAO-TCP PROJECT

The SPGRC started implementing a 1½ years (July 2012 to December 2013) project to support for the development of national strategies for plant genetic resources for food and agriculture. With funding from FAO-TCP, the project is being implemented in six SADC countries that include Botswana, Lesotho, Malawi, Mozambique, Tanzania and Zambia.

The project was rationalized by the fact that PGRFA conservation activities have been carried out in the SADC region for over 25 years. Yet, in spite of this success in conservation, the conserved material has not been adequately utilized for the benefit of the region's population. The proposed project aims at addressing the need to link PGRFA conservation to use.

The project therefore aims at enhancing linkage between PGRFA conservation and use in Southern Africa as a means of underpinning regional food security and mitigating the predicted adverse impact of climate change.

## 8. OBITUARY

The SPGRC Network regrets to announce the death of **Ms Alter MURANGI** which occurred on 21st December 2012 in Harare, Zimbabwe.

Ms Murangi was born on the 23rd of February 1967. She was first appointed as an Agricultural Assistant on 1st January 1989 at Seed Services as she was in possession of a certificate in Agriculture. She was later transferred to work at the Genebank in 1997, still as an Agricultural Assistant.

Since joining the Genebank, Ms Murangi acquired a Diploma in Agriculture with subject distinction in practicals at Gwebi college of Agriculture. She went further to acquire a Bachelor of Science Honours Degree in Agriculture at the University of Zimbabwe, with an overall degree class 2.1. She was upgraded to the post of Research Officer on the 1st of August 2007.

Ms Murangi attended the following short courses:

- Documentation and Information Training Workshop in South Africa, from 8- 19 December 2003.
- Training workshop on: Improving the identification, handling and storage of different seeds, sponsored by Kew-FAO, held in Botswana from 5 to 16 November 2007;
- Holistic Foundations for Assessment and Regulation of Genetic Engineering and Genetically Modified Organisms which was held at the Orange Free state, Bloemfontein, in South Africa from 28 June – 03 July 2009.
- Short course in the Netherlands on Plant Genetic Resources and Seeds: Policies and use from the 12th April to the 2nd May 2010.
- Certificate of Participation on Farmer's Rights Training and Trainer's Workshop at Meikles Hotel, Harare 16 July 2009.

In September 2010, Ms Alter Murangi was enrolled for MSc Programme in Plant Sciences at Wageningen University in The Netherlands for two years. The course was supposed to end in August 2012; however, she could not complete due to ill health which then led to her death on the 21st of December 2012 and was laid to rest on the 24th of December in Harare.

***She will be greatly missed. May Her Soul Rest in Eternal Peace***

## 9. FINANCIAL REPORT 2011/2012

**Table 9.1: Income & Expenditure Statement for the Year Ended 31st March 2012**

| | 2011/12, US$ | 2010/11, US$ |
|---|---|---|
| **Income** | | |
| Member States Contributions | 1,233,667 | 1,103,397 |
| ICP Contributions | 186,082 | - |
| Other Income | 81,848 | 105,046 |
| **Total Income** | **1,501,597** | **1,208,443** |
| **Expenditure** | | |
| **Operating Expenses** | | |
| Employee Benefits Expense | 373,265 | 331,316 |
| Transport, Subsistence and Conferences | 36,933 | 29,230 |
| Rents | 0 | 0 |
| General Expenses and Supplies | 96,076 | 113,483 |
| Communications | 17,544 | 18,966 |
| Audit and Professional Fees | 4,997 | 6,880 |
| Depreciation | 95,418 | 92,555 |
| ***Sub-Total*** | ***624,233*** | ***592,430*** |
| **Programme Expenses** | | |
| Member States Funded | 858,546 | 639,815 |
| ***Sub-Total*** | ***858,546*** | ***639,815*** |
| **Total Operating Expenditure** | 1,482,779 | 1,232,245 |
| **Operating Surplus** | **18,818** | **-23,802** |
| Finance (Costs)/Income | -5,770 | -6,180 |
| **Operating Surplus** | **13,048** | **-29,982** |
| **Other Comprehensive Income:** | | |
| Exchange Rate Gain/(Loss) | (22,018) | (6,744) |
| **Surplus (Deficit) for the Year** | **-8,970** | **-36,726** |

***Source:*** *SADC Financial Statements for the Year Ended 31st March 2012*

**Table 9.2: Statement of Financial Position as at 31st March 2012**

| | 2011/12, US$ | 2010/11, US$ |
|---|---|---|
| **Assets** | | |
| **Non-Current Assets** | | |
| Property, plant and equipment | 1,747,738 | 1,803,404 |
| | | |
| **Current Assets** | | |
| Debtors and prepayments | 70,773 | 152,567 |
| Cash and cash equivalents | 373,635 | 504,754 |
| | | |
| Current Assets | 444,408 | 657,321 |
| | | |
| **Total Assets** | **2,192,146** | **2,460,725** |
| | | |
| **Member States Funds and Liabilities** | | |
| | | |
| **Member States Funds** | | |
| Reserve Fund | 20,140 | 20,140 |
| Accumulated fund | 168,493 | 253,137 |
| Staff loan fund | 51,732 | 24,784 |
| | | |
| Member States Funds | 240,365 | 298,061 |
| | | |
| **Non-Current Liabilities** | | |
| Post-employment benefit | 1,698,652 | 220,096 |
| Deferred capital grant income | 169,948 | 1,752,687 |
| | | |
| ***Non-Current Liabilities*** | ***1,868,600*** | ***1,972,783*** |
| | | |
| **Current Liabilities** | | |
| Payables | 83,181 | 189,881 |
| | | |
| ***Current Liabilities*** | ***83,181*** | ***189,881*** |
| | | |
| **Total Member States Funds and Liabilities** | **2,192,146** | **2,460,725** |

***Source:*** *SADC Financial Statements for the Year Ended 31st March 2012*

**Table 9.3: Cash Flow Statement for the Year Ended 31st March 2012**

| | 2011/12, US$ | 2010/11, US$ |
|---|---|---|
| **Cash Retained from Operations** | | |
| Surplus for the year | (8,971) | (36,726) |
| **Adjustments** | | |
| Depreciation | 95,418 | 92,555 |
| Profit on Disposal of Fixed Assets | - | (23,257) |
| Finance Income | 5,770 | 6,180 |
| Exchange Gain/(Loss) | 22,018 | 6,744 |
| Transfer from Capital Grants | (54,035) | (64,945) |
| Transfer from Accumulated Fund | - | - |
| | 60,200 | (19,449) |
| Receivables | 81,795 | 17,250 |
| Payables | (106,701) | (26,728) |
| **Net Cash from Operations** | **35,294** | **(28,927)** |
| **Cash Flows from Investing Activities** | | |
| Acquisition of Fixed Assets | (39,757) | (6,962) |
| Proceeds on Disposal of Fixed Assets | - | 23,257 |
| Interest Received | - | 250 |
| Interest Paid | (5,770) | (6,430) |
| Exchange Gain/(Loss) | (22,018) | (6,744) |
| **Net Cash Flows from Investing Operations** | **(67,545)** | **3,371** |
| **Cash Flows from Financing Activities** | | |
| Member States Special Funds | (75,673) | 36,882 |
| Grants Received | - | 2,048 |
| Staff Loan Fund | 26,948 | - |
| Lease Repayments | - | - |
| Gratuity Fund | (50,148) | 1,668 |
| **Net Cash Flows from Financing Activities** | **(98,873)** | **40,598** |
| Net Increase in Cash and Cash Equivalents | (131,124) | 15,042 |
| Opening Cash and Bank Equivalents | 504,758 | 489,716 |
| **Closing Cash and Bank Equivalents** | **373,634** | **504,758** |

***Source:*** *SADC Financial Statements for the Year Ended 31st March 2012*

## 10. APPENDICES

### Appendix I: Members of the Board of SPGRC, 2012/2013

| | |
|---|---|
| Dr Julian Jaftha | – South Africa (Chairperson) |
| Ms Pedro Moçambique | – Angola |
| Ms Mary K. Molefe | – Botswana |
| Prof Jean-Albert M. Nkonko | – DRC |
| Dr Martin M. Ranthamane | – Lesotho |
| Dr Alfred P. Mtukuso | – Malawi (Vice-Chair) |
| Ms Carla do Vale | – Mozambique |
| Mr Nitish Goupal | – Mauritius |
| Mr Steve Carr | – Namibia |
| Mr Marc Naiken | – Seychelles |
| Dr Innocentia S. Kunene | – Swaziland |
| Dr Hussein Mansoor | – Tanzania |
| Dr Stephen W. Muliokela | – Zambia |
| Dr Cames Mguni | – Zimbabwe |
| | |
| ***Ex-Officio Members*** | |
| Mrs Margaret Nyirenda | – SADC Secretariat |
| Dr Jojo Baidu-Forson | – Bioversity International |
| | – Donor |
| Dr Paul M Munyenyembe | – SPGRC (Secretary) |

## Appendix II: SPGRC Staff Members, 2012/2013

| | |
|---|---|
| Dr Paul M Munyenyembe | Head, SPGRC (*18 July 2008*) |
| Ms Thandie J Lupupa | Senior Programme Manager – *In-Situ* Conservation (*16 May 2006)* |
| Mr Barnabas W Kapange | Senior Programme Manager - Documentation & Information (*09 May 2006*) |
| Mr Lerotholi L Qhobela | Senior Programme Manager – *Ex-Situ* Conservation (*15 May 2006*) |
| Mrs Mary B Phiri | Assistant Administrative Officer (*01 March 2000*) |
| Ms Florence C Chitulangoma | Assistant Finance Officer (*08 March 1993*) |
| Mrs Peggy S Ng'ono | Technical Officer-Conservation (*01 June 2005*) |
| Mr Mike Daka | Technical Officer - Documentation & Information (21 May 2012) |
| Mr Ferdinand Mushinge | Technical Officer – *In situ* (*01 March 2004*) |
| Mrs Phyllis M Litula | Personal Secretary (*12 November 2001*) |
| Mr Wilbroad M Chashi | Senior Finance Clerk (*01 July 2002*) |
| Mr Alexius M Nyambe | Driver (*01 February 1991*) |
| Mr Kapelwa E Songa | Typist/Receptionist (*01 September 1989*) |
| Mr Gibson Zulu | General Worker (*01 August 1989*) |
| Mr John Mfwembe | Worker (*04 September 1989*) |
| Mr Wale Banda | General Worker (*01 April 1990*) |
| Mr Olipen Phiri | General Worker (*05 January 2009*) |

## Appendix III: List of Some Prominent Visitors to SPGRC (2012/2013)

| | |
|---|---|
| Chikelu Mba | FAO, Rome, Italy |
| Dan Kiambi | ABCIC, Nairobi, Kenya |
| Patson Phiri | *SADC Today*/PAZA, Lusaka, Zambia |
| Kalibwani Freddie | International Water Management Institute (IWMI), Pretoria, RSA |
| Carol Thompson | North Arizona University, USA |
| Charles Nkhoma | CTDT, Lusaka, Zambia |
| Ad Spijkers | FAO Representative, Lusaka, Zambia |
| Marc Naiken | Seychelles Agricultural Agency, Seychelles |
| Nitish Goupal | Ministry of Agro-Industry & Food Security, Mauritius |
| Blessing Siwela | SADC FANR – Agric. Information Systems, Gaborone, Botswana |
| Paul Kasalwe | District Commisioner's Office, OVP |
| Elijah Ng'uni | District Commisioner's Office, OVP |
| Christine Kobili | Sen. Supt., P.U. Lusaka, Zambia |
| Brighton Mvumi | Univeristy of Zimbabwe, Trade Centre (Consultant SADC – RISDP) |
| C. Chuma | SADC Secretariat, TIFI Directorate, Gaborone, Botswana |
| Kambole Musonda | ZAMTEL, P. O. Box 3700, Lusaka, Zambia |

## 11. PUBLICATIONS

**Pungulani, L., D. Kadyampakeni, L. Nsapato, M. Kachapila (2012). Selection of High Yielding and Farmers' Preferred Genotypes of Bambara Nut (*Vigna subterranea* (L.) Verdc) in Malawi. *American Journal of Plant Sciences*, 2012, 3, 1802-1808**

**Abstract:** Bambara nut (*Vigna subterranea* (L.) Verdc) is a nutritious legume, however, its production is characterised by use of landraces, which have been maintained by farmers. Lack of improved varieties has contributed to low yields. This re- search was done to identify potentially high yielding and farmers' preferred genotypes for improved production of Bambara in Malawi. A completely Randomised Block Design experiment with eight genotypes (181CR, 181RD, 194, 137CR, 137RD, 317, 2762 and 2768) and four replicates was implemented at Chitedze, Chitala and Mbawa Research Stations to identify high yielding genotypes. In addition to the yield, farmers' criteria based on plant vigour, ability to fully bury its pods in the ground (mounding), yield at harvest, maturity period, seed colour, grain size, taste of boiled dry grain and taste of fresh pods were used to identify farmers' preferred genotypes. Significant yield differences were identified between genotypes ($P < 0.0001$), sites ($P < 0.001$) and interaction between genotypes and sites (environment) ($P < 0.001$). Yield means across sites show that genotype 181CR yielded highly (1322 kg/ha) followed by 2768 (1066 kg/ha), 181RD (1064 kg/ha) and 2762 (841 kg/ha). In contrast to the high yielding genotypes, genotype 137RD gave the lowest yield (485 kg/ha) followed by 194 (573 kg/ha), 317 (617 kg/ha) and 137CR (620 kg/ha). Mbawa Research Sta- tion showed significantly high yields with site mean of 1177 kg/ha compared with Chitedze and Chitala with site means of 703 kg/ha and 530 kg/ha respectively. Farmers ranked the eight accessions in order of importance as follows: 181RD, 181CR, 2768, 137CR, 194, 137RD, 2762 and 317. Combination of yield and farmers' preference identified three geno- types (181RD, 181CR and 2768) as potential varieties for production in Malawi. Accessions 181RD and 2768 were specifically selected for relish unlike 181CR, which has been selected for use as snack. However, further research on nutrition, value addition and marketing needs to be conducted on the identified genotypes.

**L.L.M. Pungulani1, J.P. Millner and W.M. Williams (2012). Screening cowpea (*Vigna unguiculata*) germplasm for canopy maintenance under water stress. *Agronomy New Zealand 42, 2012***

**Abstract:** Cowpea provides a cheap source of proteins, vitamins and other important nutritive elements to smallholder farmers in Malawi, but moisture stress remains a big production challenge in drought prone areas. With the aim of identifying locally adapted cowpea germplasm with drought tolerance, 36 accessions were characterised for canopy maintenance in a glasshouse at Massey University, Palmerston North. Seedlings were adequately watered until the third week after germination, and then received no water for four weeks before being re-watered for the final two weeks. Canopy responses were scored using leaf wilting scales,

leaf wilting index (LWI), relative water content, re-growth and stem greenness. The accessions showed highly significant variations (P<0.0001) for all the measured parameters. Accessions 479, 601, 645, 2226 and 3254 showed apical re-growth, high relative water content, stem greenness and lower scores for both leaf wilting scales and LWI at a soil moisture content of 2.9%. In contrast, accessions 517, 2231, 2232, 2883 and 3215 showed high levels of drought susceptibility. Multivariate analysis identified 5 distinct clusters with accessions in cluster 4 being drought tolerant and accession in cluster 5 being the most susceptible. The accessions in these contrasting clusters could provide genotypes for further genetic and crop improvement studies.