

## **1.0 EXECUTIVE SUMMARY**

The Plant Genetic Resources Research Institute (PGRRI) is one of the 13 research institutes under the Council for Scientific and Industrial Research (CSIR). The CSIR-PGRRI has the mandate to collect, characterize, evaluate, document, conserve, distribute and utilize plant genetic resources (PGR) from Ghana and abroad. The PGR are fundamental to plant improvement but are threatened through the activities of man and natural hazards. The activities at CSIR-PGRRI are administered by the Director and assisted by 6 Divisional Heads. The divisions are: Plant Genetic Diversity, Plant Genetic Conservation, Plant Protection Division, Finance, Administration and Commercialization and Information. The research programmes involve: surveys, collection, characterization, evaluation, documentation, conservation, regeneration, distribution and utilization of legumes, cereals, vegetables, root and tuber crops, medicinal plants, fruit trees, spices, forest species. The commercialization activities involve the production and sale of planting materials (seedlings), farm produce, rendering of consultancy services, eco-tourism and training. The Institute has linkages with international organizations in PGR conservation, CSIR institutes, the Universities and Non-Governmental Organizations.

### **1.1 Mandate**

The mandate of the PGRRI is to collect and conserve PGR of Ghana as well as coordinate PGR activities in Ghana.

### **1.2 Vision**

The vision of CSIR-PGRRI is to become a Centre of Excellence in sustainable plant genetic resources conservation and utilization for wealth creation.

### **1.3 Mission**

The CSIR-PGRRI has the mission to collect and conserve PGR of Ghana and from abroad to prevent their extinction.

### **1.4 Goal**

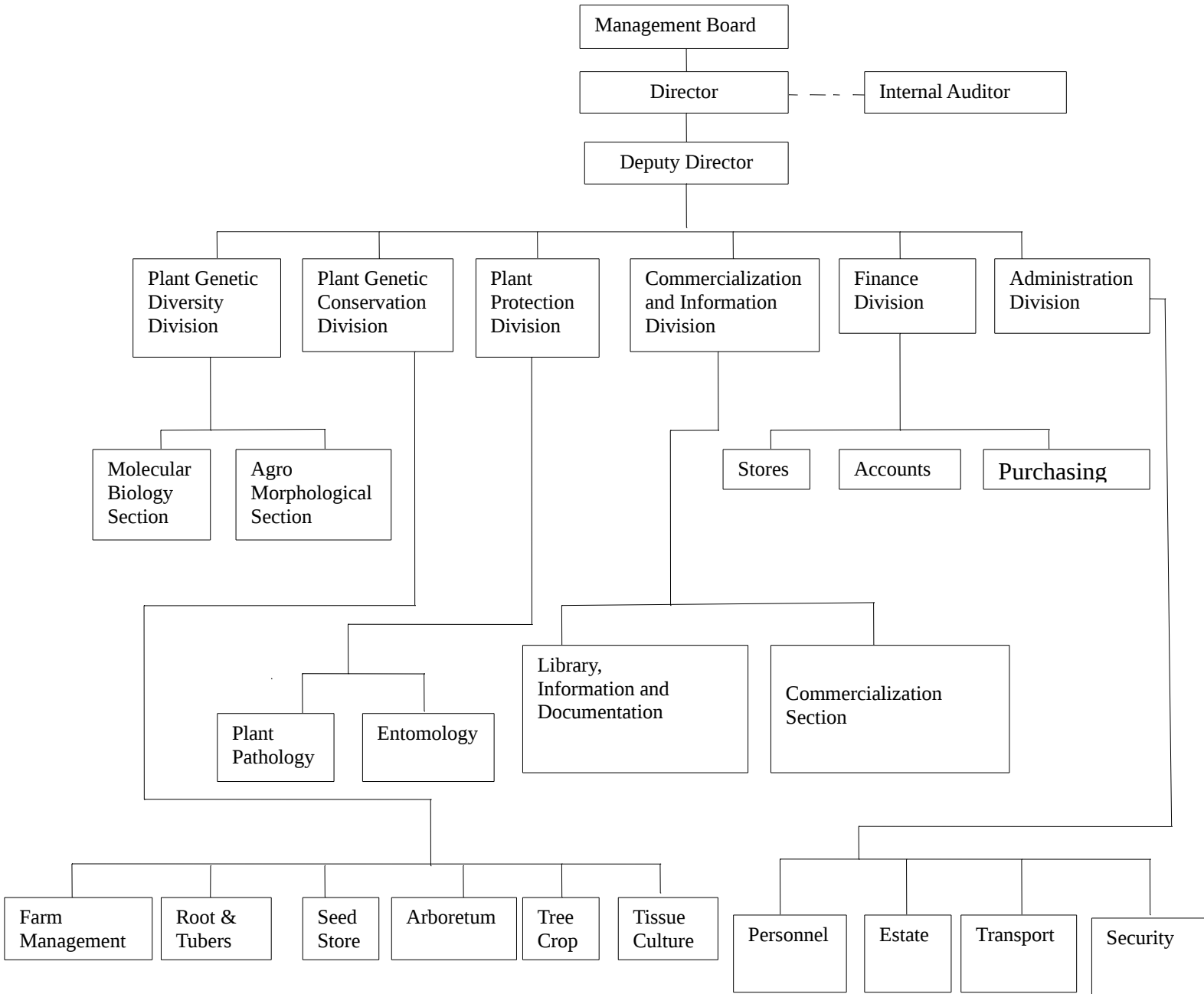
The goal of the CSIR-PGRRI is to ensure effective conservation and use of PGR for food security and sustainable agricultural development.

## **1.5 OBJECTIVES**

- To develop technologies for the efficient conservation and utilization of orthodox and recalcitrant PGR materials;
- To strengthen human resource capacity and capability;
- To identify, establish and strengthen inter institutional collaboration and linkages;
- To identify and access external donor funding and commercialized research results and;
- To gather, process and disseminate information relevant to PGR management in Ghana.

1.6

Organisational chart of CSIR-PGRRI



## **2.0 PLANT GENETIC DIVERSITY DIVISION**

**2.1 Project Title:** Development of Large Cream Seeded Cowpea Varieties for the coastal Savannah of Ghana

**Principal Investigator:** K.F., Egbadzor

**Team Members:** D. A. Kotey, D. K, Gamedoagbao, M. Yeboah and K. Ofori

### **Objectives:**

1. To find out the ratios of different seed coat colour types that would segregate from crosses involving cowpea genotypes of different colours
2. To investigate the genetic control of seed size in cowpea
3. To select cowpea lines toward development of large cream seeded varieties

### **Key results:**

- I. The number of phenotypic classes of seed coat colour depends on genotypes hybridized. Two to ten classes were observed in the current experiment. Some individuals were difficult to be classified suggesting quantitative nature of seed coat colour inheritance in cowpea.
- II. Using CB27 and Gh3710 as the large and small seeds respectively in genetic studies, small seed was observed to be partially dominant over the large. Broad and narrow sense heritability estimates were 84 and 35% respectively. Both additive and non-additive genes with their interactions in the exception of additive - additive had significant effect on seed size inheritance.
- III. Twenty four cowpea lines were selected from six different populations by farmers' participation in Ohawu. These lines have been advanced to F5 at Bunso.

## **3.0 PLANT GENETIC CONSERVATION DIVISION**

### **3.1 Tissue Culture Section**

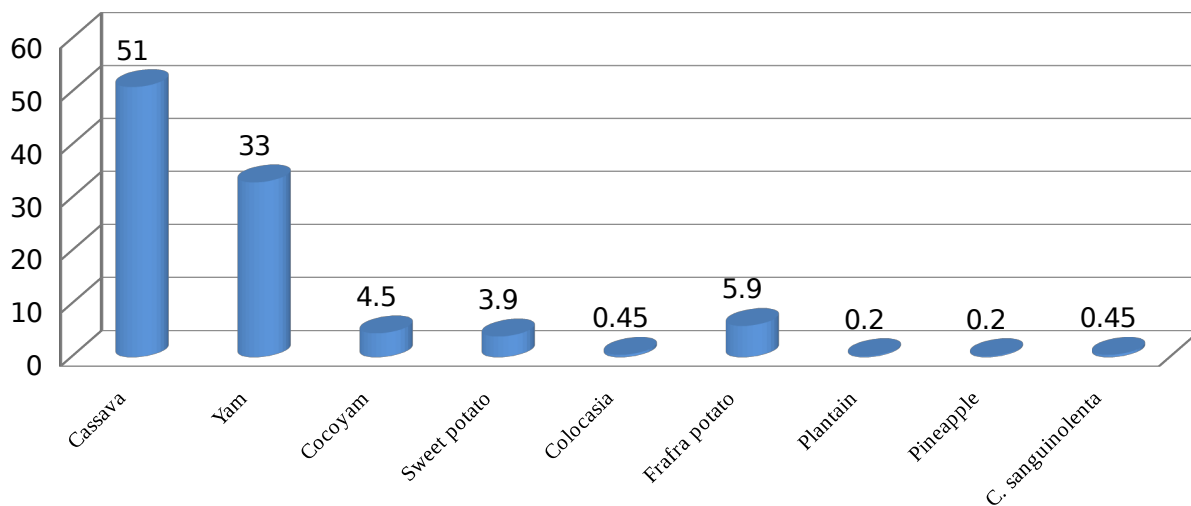
**Project Title:** Introduction of root and tuber accessions *in-vitro* and maintenance of CSIR-PGRRI *in-vitro* gene bank

**Principal Investigator: N. A. Asomani**

**Objectives:** To introduce more accessions of root and tuber germplasm *in-vitro* and maintain the CSIR-PGRRI *in-vitro* genebank.

**Key Results:**

The number of accessions under *in-vitro* was 440 comprising Cassava (51%), Yam (33%), Cocoyam (4.5%), Sweet potato (3.9%), Colocasia (0.45%), Frafra potato (5.9%), Plantain (0.2%), Pineapple (0.2%) and *Crypelepis sanguinolenta* (0.45%).



**Figure 1. Accessions under in-vitro gene bank**

**3.1.2 Project Title:** Protocol formulation for *in-vitro* conservation of *Allium* species.

**Principal Investigator: N. A. Asomani**

**Objective:** To develop a protocol for *in-vitro* conservation of *Allium* species using mature bulbs.

**Key Results:** Sixty-two percent (62%) shoots grew out of “the basal plate + part of the dome” explants and 15.4% shoots grew out of “basal plate only” explants of the initiated garlic cultures. Rooting was observed in all the control garlic cultures that developed shoots after ten (10) days of initiation.

**3.1.3 Project Title:** Protocol formulation for micropropagation of *Cryptolepis sanguinolenta* (Nibima).

**Principal Investigator:** N. A. Asomani

**Objective:** To develop a protocol for rapid multiplication of *Cryptolepis sanguinolenta* and medicinal plant.

**Key Results:** The maximum number of shoots was developed in the treatments with 2mg/l *Benzylaminopurine* (BAP). Rooting occurred only in the control experiments at a rate of 25% at eight (8) weeks after inoculation. Callus was formed in all treatments except on hormone-free medium. Maximum rooting was observed in cultures grown on MS medium supplemented with 0.2mg/L IBA. All cultures grown on medium supplemented with *Naphthaleneacetic acid* (NAA) developed callus.

### **3.2.0 Tree Crops Section**

**3.2.1. Project Title:** Preliminary investigations into vegetative propagation of Camphor tree (*Cinamomum camphor* J.) by marcotting.

**Principal Investigator:** C. M. Asare,

**Team Member:** E. Osei Owusu

**Objective:** To develop propagation techniques to produce planting materials.

**Key Results:** Marcotted shoots that had green leaves and stem after 12 weeks were considered alive. Marcots that were alive were counted for the different Indole butyric acid (IBA) treatments. Survival was highest in the 4000mg/1 IBA treatment. There was significant difference in survival of 4000mg/1 IBA treated marcots and the other treatments ( $P \leq 0.05$ ). However survival differences were insignificant amongst Indole butyric acid (IBA) treatments 0mg/1, 2000mg/1 and 6000mg/1.

There were significant differences amongst the treatments at ( $P \leq 0.05$ ). Shoots sprout was highest in marcots treated with 4000mg/1 of IBA. There was a significant difference in shoot sprout at ( $P \leq 0.05$ ) between marcot treated with 4000mg/1 of IBA and the other treatments. There were however, little significant differences amongst the other treatments. Roots formed were highest in 2000mg/1 and 4000mg/1 IBA concentrations, 0mg/1 recorded the least rooting percentage.

## PLANT PROTECTION

### 4.0 Plant Pathology Section

**4.1.0 Project Title:** Evaluation of the seed health of regenerated maize accessions in store at the CSIR- PGRRI

**Principal Investigator:** S. Akrofi

**Project Team:** E. N. Ahiatsi, and D. A. Kotey

**Objectives:** (i) To identify seed-borne fungi on maize accessions held at the CSIR- PGRRI gene bank at Bunso.

(ii) To ascertain the disease causing potentials of the pathogens identified.

#### Key Results:

**Table 1:** Occurrence of seed-borne fungi detected and their infection levels on some samples of maize accessions in stock at the CSIR-PGRRI Bunso

| Fungi                           | Incidence (%) | Infection range (%) |
|---------------------------------|---------------|---------------------|
| <i>Aspergillus flavus</i>       | 35.6          | 0 - 86.5            |
| <i>Aspergillus niger</i>        | 28.8          | 0 - 62.5            |
| <i>Aspergillus tamari</i>       | 53.7          | 0- 15               |
| <i>Fusarium verticillioides</i> | 40            | 0 - 97.5            |
| <i>Mucor</i>                    | 57.6          | 0 – 70              |
| <i>Penicillium notatum</i>      | 75.1          | 0 - 100             |
| <i>Penicillium glaucous</i>     | 42.4          | 0 – 80              |
| <i>Armillaria mellea</i>        | 2.5           | 0 - 0.6             |

All the maize accessions were infected by seed borne fungi at different levels. The results on the occurrence and the infection levels of the seed-borne fungi detected on the 117 maize accessions evaluated. Overall six saprophytic fungi and only one pathogenic fungus belonging to four (5)

were detected on the 177 maize accessions. None of the fungi detected were found alone but rather were commonly associated together with up to seven fungal types in 97.4% of the accessions.

The saprophytic fungi *Penicillium notatum* (75.1%), *Mucor* (57.6%) and *Aspergillus tamari* (53.7%) were the most common with infection levels ranging from 0- 100%; 0-70% and 0-15%. These were followed by the pathogenic fungus *Fusarium verticillioides* which is known to cause ear/kernel rot disease of maize was present on 40% of the maize accessions with infection levels ranging from 0-97.5%. The less common were the saprophytic fungi *Penicillium glaucous* (42.4%), *Aspergillus flavus* (35.6%) and *Aspergillus niger* (28.8%) with 0-80%, 0-86% and 0-62.5% infection levels. The least common was the pathogenic fungus *Armillaria mellea* 0.6% with 0- 2.5% infection level.

Five out of the eight fungi detected on the maize accessions showed highly variable infection levels (0 - > 60% and < 90%) with *Fusarium verticillioides* showing higher variability (0-97.5%). The inconsistency in the cold storage conditions in which the collection of maize seeds are kept at the CSIR-PGRRI, Bunso may have created a favourable moisture and temperature environment for the development of the seed borne fungi detected. It is therefore necessary to ensure that the cold storage conditions at the CSIR-PGRRI, Bunso is constantly maintained at sub-zero temperatures to reduce infection by seed borne fungi.

**4.2.0 Project Title:** Evaluation of *Capsicum* species land races for tolerance to Pepper mild mottle virus disease: *effect of Tri-sodium phosphate ( $Na_3PO_4$ ) on seed germination of *Capsicum* species.*

**Principal Investigator:** E. Osei Owusu

**Team Members:** S. Akrofi, E. N. Ahiatsi

**Objectives:** To determine the effect of tri-sodium phosphate ( $Na_3PO_4$ ) on seed germination of *Capsicum* spp land races



**Key Results:**

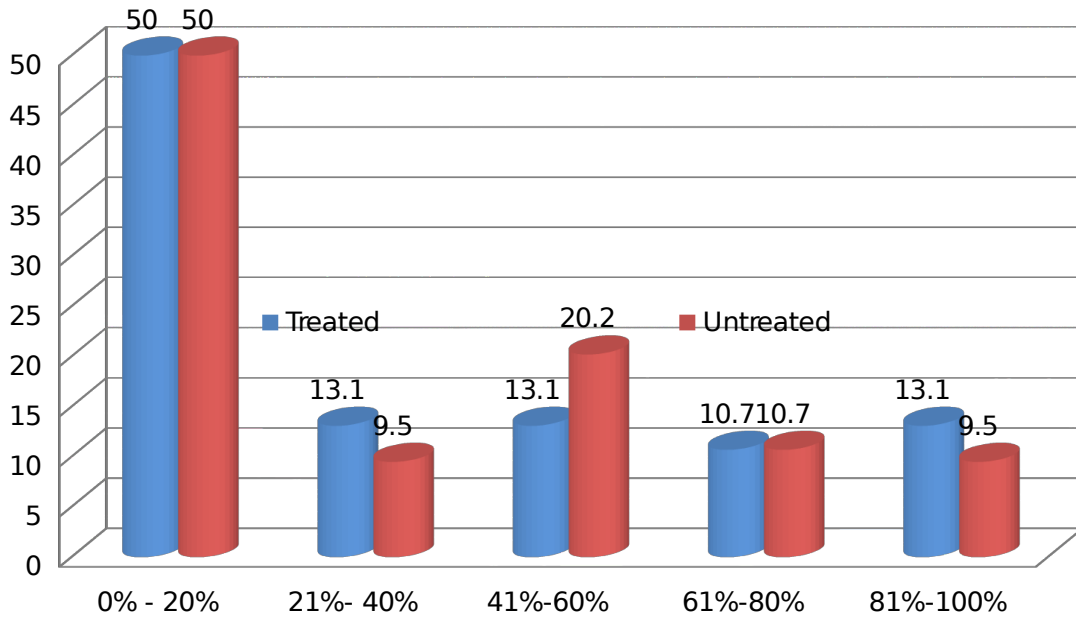


Figure 2: Effect of treatment on germination of 84 accessions of *Capsicum* species

The average germination range of the untreated seeds were higher 34.7% than the *tri-sodiumphosphate* treated seeds (33%) however the differences were insignificant at ( $P \geq 0.05$ ) according to Duncans multiple range test. The accessions fared fairly the same with both treated and untreated seeds on the field.

**4.3.0 Project Title:** Evaluation of some Cowpea Accessions against Insect Pests at Bunso

**Principal Investigator:** E.D Boamah,<sup>1</sup>

**Team Members:** D.A., Kotey,<sup>1</sup> E. A. Osekre<sup>2)</sup>

**Objectives**

The objectives were to:

- Determine the susceptibility/resistance of the cowpea accessions to insect pests of the crop in the field.
- Determine insect pests incidence on the various cowpea accessions and;

- Determine the damage caused to these accession

### Key Results:

**Table.2:** Performance of some cowpea accessions to flower bud thrips infection level in major and minor season.

| Accessions | Major season | Minor season |
|------------|--------------|--------------|
| GH 2278    | 50.41        | 19.18b       |
| GH 2307    | 37.70        | 16.48c       |
| GH 2332    | 31.47        | 25.10b       |
| GH 3670    | 36.24        | 29.59ab      |
| GH 3685    | 47.19        | 37.45ab      |
| GH 3687    | 20.88        | 52.13a       |
| GH 5038    | 42.25        | 43.16ab      |
| GH 5344    | 48.30        | 49.70a       |
| GH 6046    | 41.21        | 23.33bc      |
| GH 7167    | 28.09        | 37.21ab      |
| GH 7234    | 29.70        | 38.81ab      |
|            | NS           | P(0.007)     |

Significance different were observed in the effect of flower bud thrips on the eleven accessions evaluated with (P= 0.007) in minor season but not significant in the major season. The accession GH 3687 had the highest level of infestation and GH 2307 the least.

**Table.3:** Percentage healthy pods in major and minor season.

| Accessions | Major season | Minor season |
|------------|--------------|--------------|
| GH2278     | 22.56bc      | 18bc         |
| GH 2307    | 20.75bc      | 30.26ab      |
| GH2332     | 19.07c       | 19.31bc      |
| GH 3670    | 33.94a       | 33.95a       |
| GH 3685    | 21.16bc      | 25.44b       |
| GH 3687    | 14.66c       | 22.91bc      |
| GH 5038    | 31.32ab      | 24.76bc      |
| GH 5344    | 29.57ab      | 26.76ab      |
| GH 6046    | 19.78c       | 22.20bc      |
| GH 7167    | 22.56bc      | 13.32c       |
| GH 7234    | 15.52c       | 20.18bc      |
|            | P(0.001)     | P(<0.001)    |

Percentage healthy pods was significant in the accessions in both major and minor season. GH 3670 had the highest percentage in both major and the minor season whilst GH 3687 and

GH7167 had the lowest percentages in both major and minor season respectively as shown in Table 3.

**Table 4:** Percentage shriveled pods in both major and minor season.

| Accessions | Major season | Minor season |
|------------|--------------|--------------|
| GH 2278    | 67.07ab      | 71.59ab      |
| GH 2307    | 68.06a       | 58.67c       |
| GH 2332    | 62.75ab      | 70.46ab      |
| GH 3670    | 53.90c       | 53.94c       |
| GH 3685    | 69.77a       | 64.97ab      |
| GH 3687    | 64.74ab      | 68.32ab      |
| GH 5038    | 51.82c       | 60.69bc      |
| GH 5344    | 54.86bc      | 59.97bc      |
| GH 6064    | 65.94ab      | 64.01bc      |
| GH 7167    | 62.98ab      | 77.12a       |
| GH 7234    | 69.93a       | 69.84ab      |
|            | P(0.001)     | P<0.001      |

Table 4 Shows significant differences were observed among the accessions evaluated on the percent shriveled pods in the major and the minor seasons. The accessions GH 5038 and GH 3670 had the lowest percentage in both the major and minor season. The highest percentages were also recorded in GH 7234 and GH 7167 in the major and minor seasons respectively.

**Table 5:** .Performance of some cowpea accessions at Bunso in major and minor season 2013.

| Accessions | Days to maturity | Grain yield(kg/ha) |              |
|------------|------------------|--------------------|--------------|
|            |                  | Major season       | Minor season |
| GH 2278    | 65-75            | 1500               | 400          |
| GH 2307    | 65-75            | 2100               | 600          |
| GH 2332    | 65-75            | 1250               | 600          |
| GH 3670    | 65-70            | 2900               | 1000         |
| GH 3685    | 70-80            | 1700               | 500          |
| GH 3687    | 75-85            | 800                | 700          |
| GH 5038    | 65-70            | 2100               | 700          |
| GH 5344    | 65-70            | 3500               | 1000         |
| GH 6046    | 65-70            | 1700               | 500          |
| GH 7167    | 75-85            | 400                | 400          |
| GH 7234    | 65-70            | 1400               | 400          |

The yield of the accessions evaluated during the major and minor seasons at Bunso were as follows: the number of days to maturity ranged from 65-85, and GH 7234 matured earliest while GH 7167 matured late. The grain yield in major season ranged from 400 kg/ha (GH 7167) to 3500kg/ha (GH 5344). The yields were low in minor season and ranged from 400 kg/ha (GH 7167) to 1000 kg/ha (GH 3670). The low grain yield recorded in the minor season might be due to high insect pressure and the drought.

## 5.0 COMMERCIALIZATION AND INFORMATION DIVISION

5.1 Commercialization Section L.M. Aboagye, D. K. Gamedoagbao, F. Adjei, C. A. Mpere,, P. Somevi)

### Seedling Production:

Filling of bags with top-soil, nursing of seeds/rootstock, budding and grafting/ Collection of bud wood, watering. Sowing and transplanting of seedlings, weed control, and sale of seedlings. Nursery maintenance and harvesting of fruits.

### Ecotourism:

Maintenance of the arboretum and construction of trails, enrichment of planting, printing of flyers and posters. Erection of sign posts.

#### ➤ Revenue from Sale of various items.

| Item                | Total Amount (GH¢) |
|---------------------|--------------------|
| Citrus              | 17,539.00          |
| Coconut             | 10,290.00          |
| Oil palm            | 10,004.00          |
| Nutmeg              | 5,839.50           |
| Minor seedlings     | 6,174.50           |
| <b>Farm Produce</b> |                    |
| Oil palm fruits     | 7,301.05           |
| Other fruits        | 3,509.00           |

**Ecotourism**

|                        |                  |
|------------------------|------------------|
| Entrance Fee and Tours | 4,208.00         |
|                        | -----            |
| <b>Total</b>           | <b>64,865.05</b> |
|                        | =====            |

**Expenditure**

|                           |                  |
|---------------------------|------------------|
| Avocado and Mango stones  | 550.00           |
| Tractor Maintenance       | 1,510.00         |
| Citrus planting materials | 226.50           |
| Coconut seednuts          | 1,992.00         |
| Polybags                  | 3,477.60         |
| Agro-chemicals            | 1,878.00         |
| Repair of Equipment       | <u>1,315.00</u>  |
| <b>Total</b>              | <b>10,949.10</b> |
|                           | -----            |

**Net Income (64,865.05 – 10,949.10) = 53,539.95**

**5.2.0 Library and Documentation Section (R. A. Dogoe, P. S. Osei-Kofi,)****Objective**

The general objective of the library during the report period was to identify, acquire and make available a wide range of relevant information resources and more especially to provide information services to researchers and staff as well as interested users of plant genetic resources information.

**User Services:** During the year, the Section routinely, provided the following services to clients: literature searches, current awareness services, selective dissemination of information, reference and lending services. One thousand eight-hundred and sixty eight (1, 868) visits were made to the library during the review period. .

**Literature searches:** During the year, 28 literature search requests submitted to the library were duly answered and forwarded to clients.

**Technical Services:** The Section acquired forty-six (46) information resources during the year under review including print and electronic books, journals, technical and annual reports. These were duly accessioned, analyzed and assigned metadata.

**User Training:** During the year, the library offered a one-on one training in information search strategies to fifteen users.

**Extension Activities:** The Section extended its services to four basic schools in the East Akim District by way of soliciting children's books donation from Biblionef Ghana on their behalf.

### 5.2.1 Germplasm Documentation Activities

**Project Title:** Assembly and digitization of germplasm collection

**Principal Investigator:** P. S. Osei-Kofi

**Member:** R. A. Dogoe,

**Objective:** To provide an update of a necessary backup to genebank collection information

**Key Results:** One hundred and sixteen (116) germplasm collected from 12/9/2011 to 7/5/2013 were digitized. Nineteen (19) accessions of the germplasm documented were leguminosae comprising cowpea (1), *Pueraria phaseoloide*(1), *Papilionaceae* (2), *Cucurbitaceae* (1), Solanaceae (7) and Araceae 87(*Colocacia esculanta*).

**Projects Database:** All On-going Research Projects database were updated and new project records were added during the year.

**Staff publications database:** The Staff Publications database was updated, reformatted and uploaded to CSIR-INSTI for inclusion in the on-going Directory of CSIR Research Publications being compiled at INSTI.

## 7.0 FINANCE DIVISION (FINANCIAL ACCOUNTING)

### 2013 BUDGET PERFORMANCE (GOG)

| ITEM               | INCOME GH¢ | ACTUAL GH¢ | VARIANC GH¢ |
|--------------------|------------|------------|-------------|
| Compensation       | 4,422,145  | 4,422,145  | -           |
| Goods and Services | 404,306    | 404,306    | -           |
| Assets             | 8,979      | 8,979      | -           |
| IGF                | 79,739     | 79,739     | -           |
| Totals             | 4,915,169  | 4,915,169  | -           |

### RECURRENT EXPENDITURE 2013

|                               |                  |
|-------------------------------|------------------|
| Compensation                  | 4,422,145        |
| General Administration        | 271,611          |
| General Repairs & Maintenance | 46,601           |
| Travel and Transport          | 45,044           |
| Financial Charges and Fees    | 11,352           |
| Direct Research Expenses      | 29,698           |
| Total                         | <b>4,826,451</b> |

## 6.0 ADMINISTRATION DIVISION

**Key activities:** The major activities at the Administration Division during the year under review included Human Resource function, Spanning from Recruitment through Training to Retirement

**Meetings:** The institute held fourteen meetings during the year under review

**Staff Training:** Four staff pursued further training in tertiary institution. This included one MPhil seed science, two HND in Laboratory Technology and Agriculture, and one DBS Secretary ship.

**Promotions:** Thirteen staff were promoted as follows: five Senior Staff and eight Junior staff

**Resumption of Duty:** One (1) Senior Member and 1 Junior Staff resumed duty after completing their respective courses.

**Retirement:** Four (4) Senior Staff and 2 Junior Staff retired compulsorily from the Service of the Council.

**National Service:** Seven (7) National Service Personnel's were posted to the Institute for their national service assignment.

**Practical Attachment:** The Institute accepted 9 students to do industrial attachment at the various Divisions.

## **Appendix I: Publications**

### **Refereed Journal Paper 2013**

Asare, C. M., Owusu, E. O. (2013). Effect of shoot physiological age and indole-3-butyric acid on vegetative propagation of velvet tamarind (*Dialiudguineese* wild) by stem cutting. Ghana Journal of Forestry, Vol. 49 (1&2): 60-66



Aaron T. A., Bhavani S. G., Galyuon, I. K. A., **Aboagye, L. M.**, Takrama, J. F., Padi, F. K., and Timko, M. P. (2013). Identification of potential sources of *striga* resistance in cowpea [*VignaUnquiculata*(L.) walp.] accessions from Ghana. *Journal of Microbiology and Biotechnology Research*, Vol 3.1: 14-22 (<http://scholarsresearchlibrary.com/archive.html>)

**Asiedu-Darko, .E** (2013). Agricultural extension delivery in Ghana: A case study of factors affecting it in Ashanti, Eastern and Northern regions of Ghana. *Journal of Agricultural Extension and Rural Development* Vol. 5(2), pp. 37 –41, February, 2013 Available online at <http://www.academicjournals.org/JAERD> DOI: 10.5897/JAERD12.121

**Egbadzor, K. F.**, Yeboah, M., Offei, S. K. and Danquah, E. Y. (2013). Farmers' key production constraints and traits desired in cowpea in Ghana *Journal of Agricultural Extension and Rural Development* Vol. 5(1), pp. 14-20, Available online at [http:// academicjournals.org/JAERD](http://academicjournals.org/JAERD) IJ

**Egbadzor, K. F.**, Yeboah, M., Danquah, E. Y. and Offei, S. K. (2013). Identification of SNP Markers Associated with Seed Size in Cowpea [*Vignaunquiculata* (L) Walp] *International Journal of Plant Breeding and Genetics* 7 (2): 115-123, 2013 ISSN 1819-3923/ DOI: 10.3923/ijbg.2013.115.123

Osei, M.K., Offei Bonsu, K., **Asare, C.M.**, Agyeman, A., Gyau, J. And Choi, H.S. 2013. Germplasm collection: A prerequisite for tomato breeding programme in Ghana. *Advance Crop Science*. [www.knowledgesPublisher.com/Home](http://www.knowledgesPublisher.com/Home). Vol.3. No.9:568-578.

Rudebjer, P., Chakekeredza, S., Dansi, A., Ekaya, W., Ghezae, N., **Aboagye, L. M.**, Kwapata, M., Njoroge, K., and Padulosi (2013). Beyond commodity crop: Strengthening young scientists' capacity for research on underutilized species in Sub-Saharan Africa. "Proceeding of 2<sup>nd</sup> International Symposium on Underutilized Plant Species" Eds: Massawe, F., et al. *Acta Hort*, 979, ISITS, 577-587.

## Technical Reports

**Asare C. M.**, Owusu E. O., Bedeh D. K. (2013). Vegetative propagation of *Cinnamomum camphora* (L.) Presl by Cuttings: effect of shoot physiological age. CSIR-PGRRI/RE/CMA/2013/79

## Thesis

**Opoku Mensah, Abednego Tei** (2013). Knowledge and perception of consumers on Black coloured cowpea. A dissertation on 'knowledge and perception of consumers on Black coloured cowpea' submitted to the Department of Agribusiness, Presbyterian University College, Ghana, Okwahu Campus, Abetifi in partial fulfilment of the award of Degree in Agribusiness.

## **Appendix II: Senior Members**

### **Administration Division**

| <b>No.</b> | <b>Name</b>           | <b>Qualifications</b>   |
|------------|-----------------------|---|
| 1          | Lawrence Misa Aboagye | BSc Agriculture, MSc Plant Physiology, PhD Plant Breeding and Physiology<br>Director              |
| 2          | Philip Annor Nyamah   | BE.D Educational Foundation, MPA Public Administration<br>Administrative Officer                  |
| 3          | Emmanuel Asiedu-Darko | Head of Administration<br>BA (Hons) Social Science. MA. Adult Education<br>Administrative Officer |

### **Plant Genetic Conservation Division**

| <b>No.</b> | <b>Name</b>             | <b>Qualifications</b>   |
|------------|-------------------------|---|
| 1          | Chris Mpere Asare       | BSc. (Hons) Agric., MPhil. Horticulture<br>Senior Research Scientist<br>Ag. Deputy Director |
| 2          | Matilda Ntowaa Bissah** | Head of Division<br>BSc (Hons) Botany, MPhil Botany<br>Research Scientist                   |
| 3          | Naomi Asomani Antwi     | MSc. Biological Sciences  |
| 4          | Samuel Kwasi Owusu      | Dip. Post-Harvest Technology, BSc Agriculture<br>Research Scientist                         |

### **Plant Genetic Diversity Division**

| <b>No</b> | <b>Name</b>             | <b>Qualification</b>  |
|-----------|-------------------------|---|
| 1         | Samuel Kwasi Boateng    | BSc. (Hons) Botany, MPhil Botany ,PhD.<br>Senior Research Scientist |
| 2         | Kenneth Fafa Egbadzor** | BSc.(Hons) Agric, MPhil (Plant Breeding)<br>Research Scientist      |

3 Nicholas Gbenartey Badger\* Dip. Extension and Farm Management,  
BSc. (Hons) Agric. Assistant Research Scientist

**Plant Protection Division**

| No | Name                       | Qualifications  |
|----|----------------------------|---|
| 1  | Susana Akrofi              | BSc. Agric., MPhil Plant Pathology, PhD.<br>Research Scientist Ag. Head of Division |
| 2  | Daniel Ashie Kotey         | BSc.( Hons) Biology, MPhil Entomology<br>Research Scientist                         |
|    | Emmanuel Boamah Duku       | BSc.( Hons) Agric, MPhil Entomology<br>Research Scientist                           |
| 3  | Edmund Osei Wusu           | BSc. Biology., MPhil Plant Pathology  |
| 4  | Emmanuel Norkplim Ahiatsi* | Dip. Ext. and Farm Management, BSc. (Hons)<br>Agric. Assistant Research Scientist   |

**Commercialization and Information Division**

| No. | Name                       | Qualifications   |
|-----|----------------------------|--|
| 1   | Dickson Koroku Gamedoagbao | BSc. (Hons) Agric., MSc. Eremology<br>Senior Scientific Secretary Head of Division |
| 2   | Regina Atawa Dogoe         | BA (Hons) Arts, Post Graduate Diploma in Library<br>Studies, Librarian             |
| 3   | Paul Smart Osei-Kofi*      | Dip. Archives Administration, BA Social Science<br>Assistant Librarian             |

**Accounts Division**

| No. | Name          | Qualifications   |
|-----|---------------|--|
| 1   | Francis Adjei | BSc. Accounting, MBA Accounting and Finance<br>Assistant Accountant Head of Division |

\*MPhil/MSc Student

\*\*PhD Student

**Appendix III: List of Senior Staff**

| No. | Name             | Grade                   |
|-----|------------------|-------------------------|
| 1   | Forson K. Ayensu | Chief Technical Officer |

|    |                        |                                    |
|----|------------------------|------------------------------------|
| 2  | Robert Darko           | Chief Technical Officer            |
| 3  | Edward K. Darkoh*      | Chief Technical Officer            |
| 4  | Philip C. Somevi       | Chief Technical Officer            |
| 5  | George Oppong          | Chief Technical Officer            |
| 6  | Samuel Wilson K. Asare | Chief Security Officer             |
| 7  | Joseph K. Oboe-Sam     | Chief Purchasing Assistant         |
| 8  | Catherine E. Dzokoto   | Principal Technical Officer        |
| 9  | Abednego Opoku Mensah  | Principal Technical Officer        |
| 10 | Salome Yeboah          | Senior Administrative Assistant    |
| 11 | Ebenezer Adu Yeboah    | Senior Technical Officer           |
| 12 | Isaac F. Asare-Larbi   | Assistant Farm Manager             |
| 13 | Evans Gayomeh          | Senior Stores Superintendent       |
| 14 | Emmanuel Ofori         | Senior Administrative Assistant    |
| 15 | Isaac Tawiah           | Senior Assistant Transport Officer |
| 16 | Nkansah Boakye         | Senior Assistant Transport Officer |
| 17 | Samuel Abrokwa         | Assistant Transport Officer        |
| 18 | Godwin Hussey          | Works Superintendent               |
| 19 | David Oppong Adu       | Senior Security Officer            |
| 20 | Samuel M. Konadu       | Security Officer                   |
| 21 | Edward Adams Sangmor   | Security Officer                   |
| 22 | Richard Aklatey        | Security Officer                   |
| 23 | Ransford Agbedanu      | Assistant Farm Manager             |
| 24 | Juliana Samaah         | Assistant Farm Manager             |
| 25 | Peace Okumka           | Assistant Farm Manager             |
| 26 | Ishmael Owusu          | Assistant Farm Manager             |