COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH

PLANT GENETIC RESOURCES RESEARCH INSTITUTE

ANNUAL REPORT

2014

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 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.

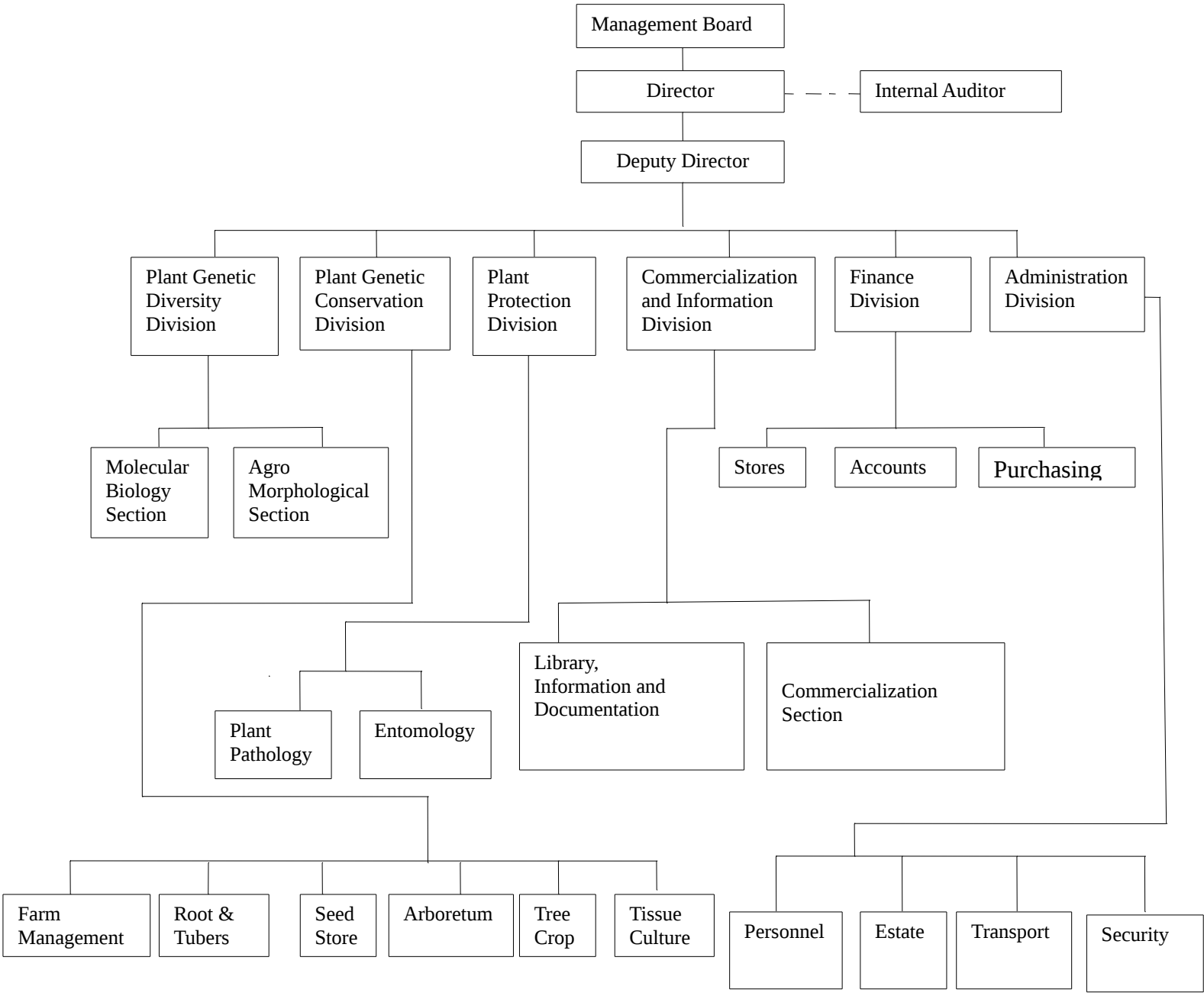
1.4 Goal

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: The performance of 5 selected pepper accessions in comparison with 2 local varieties

Principal Investigator: S.K. **Boateng**

Project Team: L. M Aboagye, C. M. Asare, S. Akrofi, D. K .Gamedoagbao, K. F. Egbadzor, E. Osei Owusu, E. D. Boamah, O. Bonsu, M. Quai.

Objective: To compare growth and yield of 5 selected accessions to 2 local varieties.

Key Results:

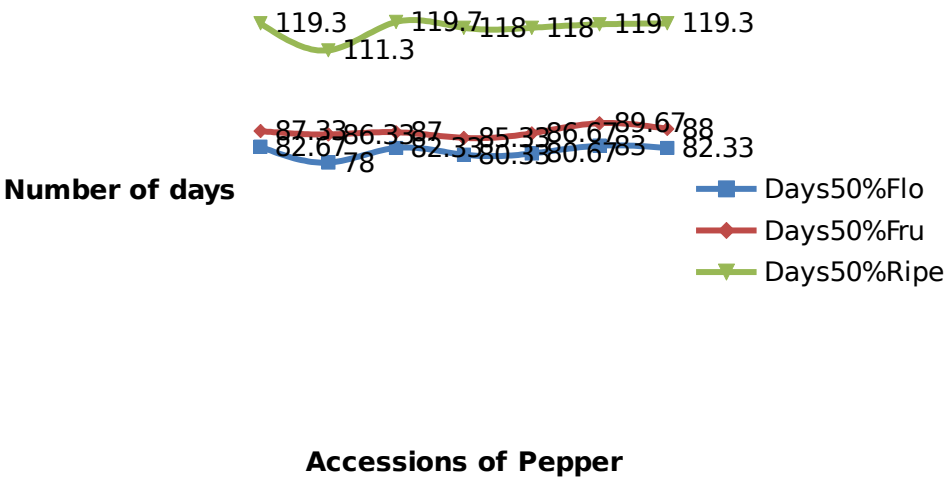


Fig. 1 Number of days to 50% Reproductive stage of Pepper accessions

The total number of fruits harvested was highest in Accession A11A followed by accession A12A and then accession CH8. The number of fruits of accessions A11A and A12A were significantly different from one of the local accessions (BAG0014002A) (P = 0.023). The number of fruits per plant was higher in Accessions A11A and A12A than the other accessions. They were however not significantly different from the rest of the selected accessions and the two local varieties (Controls) (P = 0.087).

The yield per plant was highest in accessions A12A (119.7g) followed by accession SBL26 (107.4g) and lowest in accession A9A. When compared to the local cultivars there were significant differences between the means of the accessions (P = 0.015).The study shows that days to 50% flowering were lowest in Accession CH8 (78 days) and highest in Accession SBL26 (82.6 days). There was however no significant difference between the five selected pepper accessions and the local cultivars (P = 0.471).

Similarly the number of days to 50% fruiting ranged from 85.33 days in A11A to 89.67 days in one of the local cultivars (Accession BAG14002A). There was no significant difference between the accessions (P = 0.77). The study shows that, of the 5 selected accessions, the number of days to 50% ripening of fruits was highest in accession A9A (119.7 days) and lowest in accession CH8 (111.3 days).

Plant height was highest in Accession A9A and was followed by Accession SBL26. Accession CH8 had the lowest plant height (32cm). The height of accession A9A was significantly different from accession CH8 and the local varieties (P = 0.054).Plant spread was widest in SBL26 (49.9cm) and was followed by accession A11A (49.1cm). These were not significantly different from the two local varieties (P = 0.622).

2.1.2 Project Title: The effect of leguminous cover crops on growth and yield of tomato
Principal Investigator: Boateng, S. K.
Project Team: K. F. Egbadzor, D. Allotey

Key Results: The number of fruits per plant was highest in *Canavalia* treated plots and lowest in *Mucuna* plots. The treatments of the leguminous plots of tomato plants were not significantly different from that of the control and the fertilizer applied plots (P = 0.228).Fruit weight per plant was highest in *Canavalia* treated plots (535 g) and lowest in *Mucuna* treated plots (302 g) and there were significant differences between treatments means (P = 0.006). The plant height was highest in the control (73.27 cm) and lowest in the fertilizer applied plots (66.37 cm) and the difference was significant (P= 0.055).

Plant spread was highest in *Canavalia* treated plots (68.3 cm) and smallest in *Mucuna* treated plots (56.7 cm). The differences between them were on the borderline of significance (P = 0.098). Mean fruit diameter ranged from 53.2 mm in cowpea treated plots to 56.59 mm in the control plants. Treatment means were significantly not different (P = 0.659). The number of days to 50% flowering was earliest in *Canavalia* treated plots (60 days) and in cowpea it was 63.33 days. These were not significantly different from the control and fertilizer applied plots (P = 0.282). The number of days to 50% fruiting was similarly lowest in *Canavalia* treated plots.

Number of days to 50% flowering and fruiting of tomato plants on different treatment plots (67 days) and highest in Cowpea treated plots (69.33 days). These results were not significantly different from the control and fertilizer applied plots (P = 0.313).

PLANT GENETIC CONSERVATION DIVISION

3.0 Tissue Culture Section

3.1 Project Title: Protocol formulation for in vitro conservation of *Allium* species.
Principal Investigator: N. A. Asomani

Objective: 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. Thirty point one percent (30.1%) of leaves developed by six (6) weeks old secondary garlic cultures grown on hormone free medium dried out. At six weeks old 57.4% of secondary cultures on hormone free medium had developed roots.

4.0 PLANT PROTECTION

4.1 Plant Pathology

4.1.1 Project Title: Development of Control Measures for Leaf Twisting and Basal Rot diseases of onion in the Eastern Region of Ghana.

Principal Investigator: S. Akrofi.

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

Objectives

- To determine the most effective fungicide seed treatment that can control leaf twisting and basal rot diseases of onions in the field.
- To identify onion varieties that are tolerant to leaf twisting and basal rot diseases.

Key Results:

(*i) Evaluation of two different fungicides as seed treatment for the control of leaf twisting and basal rot diseases of onion.*

There were little significant differences between fungicide treatments and the control treatment with regard to plant establishment, incidence of basal rot disease and yield obtained ($p > 0.05$), but significant difference was observed with regards to the incidence of leaf twisting disease ($p < 0.05$) (Figs. 1 and 2). The application of the non-systemic fungicide Mancozeb as seed treatment significantly reduced the incidence of leaf twisting disease compared with the control (7.8% vs. 32.7%), but this was statistically at par with the application of systemic fungicide Victory (7.8% vs. 9.1%). These results may suggest that the use of the non-systemic fungicide, Mancozeb as seed treatment is effective in reducing the incidence of leaf twisting disease compared to no fungicide seed treatment.Its effect is however similar to that of the systemic fungicide Victory. The effectiveness of these two fungicides is $p < 0.05$different compared with the no fungicide seed treatment with regard to the control of basal rot disease. Studies have shown that mancozeb seed treatment reduced seed mycoflora on onion and increased the germination percentage.

ii. Evaluation of the farmers' onion variety Malavi against four improved onion varieties

There were significant differences between the onion varieties with regard to plant establishment; incidence of basal rot disease and yield ($p<0.05$) but little significant differences were observed between the varieties in the incidence of leaf twisting disease ($p>0.0.05$). The results showed that percentage plant establishment of the farmers' variety Malavi was significantly higher than that of Norflaye (74% vs. 48%) and consequently produced a significantly higher yield than Norflaye (13t/ha vs. 3t/ha) but was statistically at par with the other improved varieties in these characteristics. There were no significant differences between Malavi and the improved varieties with regard to the incidence of leaf twisting disease. The incidence of basal rot disease in Malavi was significantly higher than in Texas grano (0.2 vs. 0)but was similar to the other improved varieties. These results may suggest that the farmers' onion variety Malavi is similar in tolerance to leaf twisting disease as the improved varieties but tolerance to basal rot disease and yield could be better than some of the improved varieties. These findings support the opinion of the onion farmers in the Fanteakwa district that Malavi is a better choice of variety for cultivation in their area. Nevertheless an improved onion variety has been identified in Burkina Faso that is resistant to both leaf twisting and basal rot diseases. PREMA 178a newly released onion variety is tolerant to high rainfall and humidity and can produce yields as high as 25t/ha compared with traditional variety Violet de Galamy which do not grow well in high humidity and rainfall and produces only about 20t/ha even in the dry season(USAID/West Africa, 2013). Field evaluation of the variety Malavi against PREMA 178 would be very useful.

4.1.2 Project Title: Control of Cassava root rot disease in the Brong-Ahafo Region of Ghana, by appropriate farm management practices.

Principal Investigator: S. Akrofi

Project Team: E. Moses, G. A, Bolfrey, K. Akuako, E. D. Boamah and G. Quansah

Objectives:

1. To determine the incidence and severity of cassava root rot disease in Forest and Transition zones of the Brong- Ahafo Region
2. To identify the causal organism(s) of the cassava root rot disease and its host range
3. To identify resistant/tolerant improved varieties and local cultivars of cassava to cassava root rot disease in these areas
4. To identify cultural practices that favour the spread and persistence of cassava root rot disease in these areas
5. To disseminate findings to farmers and other stakeholders through extension service, scientific publications and workshops.

Key Results:

Fig. 2: Cassava tubers with symptoms of soft root rot

Three local cassava cultivars *Abenewoha*, *Ankra* and *Bosomnsia* were identified in farms, with each farmer cultivating two (2) acres on average. The most popular variety cultivated was *Abenewoha*. Fifteen (15) out of the twenty two (22) cassava farms surveyed showed symptoms

of cassava root rot. The infected farms had matured plants aged one (1) year to one and half ($1^{1}/_{2}$) years. All the infected farms had been cultivated with cassava for three or more consecutive years. These farms were planted either as a monocrop or intercropped with crops such as maize, cocoyam, pepper and groundnut. The farmers did not harvest their entire mature cassava crop at once, especially if it is meant for sale, due to lack of ready markets for storage roots. The cassava farmers in the three districts did nothing to control the disease. Farm sanitation was very poor as heaps of the rotten cassava tubers were left in the farm after harvest; which could provide sources of primary inoculum for subsequent crop. The incidence of cassava root rot ranged from 0.8% to 13% and severity from 10% to 13%. The variety *Abenwɔha* showed the highest root rot incidence and severity. Both cassava dry and soft root rot were observed in the field (Figs.2). The fungi isolated from some of the rotten specimen included *Lasiodiplodia theobromae*, *Fusarium* sp., *Armillaria* sp., and *Aspergillus* sp and some bacteria. Other major diseases also prevalent in the farms surveyed were cassava mosaic disease (CMD), cassava bacterial blight (CBB), and cassava anthracnose disease (CAD).These diseases also reduce yield and the amount of healthy stems available for subsequent planting.

4.2.0 Entomology Section

4.2.1 Project Title: Integrated management of *Plutella xylostella* (DBM) and *Leucinodes orbonalis* (EFSB) in the Volta region

Principal Investigator: D. E. Boamah

Project Team:S. Akrofi, D. K. Gamedoagboa, K. F.Egbadzor, E. O., Owusu, K.Afreh-Nuamah, H. Davies, E. F. Appiah, A. N. Eyram, I. F. Addo-Okyireh, L. Kudoto**,** W. Afari, P. Y. Kpa.

Objective: To increase production of cabbage and garden egg through the development and dissemination of an integrated pest management (IPM) strategy for *Plutella xylostella* and *L. orbonalis*.

Key Results:

Fig.3 Focus group discussions at Abuipe (left) and field inspection at Aneta (right) during the diagnostic survey.

All twelve (12) farms visited revealed that the main garden egg variety cultivated is 'Kpando." Cultivation is mainly in the major rainy season (March-June). The major insect pest problem in the area was the eggplant fruit and shoot borer (EFSB) *L. orbonalis.* The level of infestation in all the 12 farms visited was above 80%. Though there were other insects like leaf rollers and stem borers; their levels of infestation were minimal. Farmers in the area relied on Organophosphates, cabamates, and synthetic pyrethroids insecticides to control the insect pest, spraying volumes higher than the recommended levels at very short time intervals.

The infested garden egg fruits and shoots sampled from the farmers' field during the diagnostic survey were cultured at the laboratory for further studies. About 95% of adults emerged were identified to be eggplant shoot and fruit borer *L. orbonalis*

5.0 COMMERCIALIZATION AND INFORMATION DIVISION

5.1 Commercialization Section

Team Leader: Gamedoagbao, D. K.
Project Team: D. K. Gamedoagbao, B.Briamah, P. Somevi, G. Oppong,

- **AREAS OF INCOME**

1. Planting materials production
2. Sale of Farm produce
3. Contract Research.

Projection & Actual Income 2014

Item	Quantity Projected	Unit Price (GH¢)	Projected 2014 (GH¢)	Jan – Dec. 2014 (GH¢) Actual	Variance
Seedlings					
Citrus	18,000	1.00	18,000	16,094.00	(1,906)
Coconut	3,000	5.00	15,000	8,725.00	(6,275)
Oil Palm	4,000	3.00	12,000	11,886.00	(114)
Nutmeg	10,000	1.50	15,000	9,931.00	(5,069)
Minor s	5,000	1.00	5,000	17,171.00	12,171
Ornamentals				3,473.00	3,473
Palm fruits	100,000	.15/kg	15,000	18,042.00	3,042
Other Fruits	50,000	0.10	5,000	2,239.00	(2,761)
Ecotourism					
Entrance fees			5,000	4,010.00	(990)
Total			**90,000.00**	**91,571.00**	1,571

EXPENDITURE (JAN – DEC. 2014)

	PROJECTED	ACTUAL
Refund of seedlings sold (Planting)	GH¢4,000.00	GH¢200.00
Top Soil	GH¢2,000.00	GH¢1,000.00
Coconut seed nuts	GH¢5,000.00	GH¢0.00

consumables (Polybags) Labour	GH¢10,000.00	GH¢4,863.31
Meeting and Conferences	GH¢2,000.00	GH¢5,891.30
Agro Chemicals(Fuel for irrigation)	GH¢3,000.00	GH¢11,340.70
Repair of Equipment	GH¢1,600.00	GH¢3,822.00
Farm Implements	GH¢2,000.00	GH¢1,388.00
Contract Printing (Invoice)		GH¢1,500.00
Per Diem Allowance		GH¢1,442.00
Security Expenses		GH¢900.00
Total	**GH¢27,600.00**	**GH¢32,347.31**

Net Income (Jan-Dec 2014)
GH¢91,571.00 - GH¢32,347.31 = GH¢59,224.69

5.2 Library and Documentation Section

Introduction: The Library Section continued to provide information services to users during the year. In line with its mission as information services centre, the library in addition to its regular services (lending, reference services, current awareness services, and selective dissemination of information.) also engaged in community services aimed at improving the information resource base of selected Basic School libraries.

Key Results: A total of forty-nine (49) library resources were acquired during the year under review. These included annual reports, books, brochures, and journals.A total of one thousand three hundred and thirty-four (1334) visits were recorded during the period.

Literature searches: Fifteen literature search requests were received and answered during the year under review. However, in the absence of Internet facility at the Library, the staff had to rely only on offline resources to answer the requests.

Extension Services: An initiative carried out by the library during the year was the provision of an extension service aimed at helping basic schools to acquire books for their libraries.

In addition, the library is partnering with Biblionef Ghana to develop a manual for the schools, to help them organize their library collections and to provide effective library service to the school pupils and teachers.

6.0 ADMINISTRATION DIVISION

6.1 Key activities: Performs human resource function spanning from recruitment through training and retirement

Table 3: Meetings

No.	Type of Meetings	No. of Meetings
1	Management Board	3
2	Internal Management Committee	3
3	Heads of Division	3
4	Human Resource Development Committee	2
5	General Meeting	2
6	Tourism Management Team	3

6.1.2 Resumption ofduty: One (1) Senior Member and Two (2) Junior Staff resumed duty after successfully completed programme at KNUST and Sunyani Polytechnic respectively.

Table 4: Staff Training

No.	Name	Programme	Institution of study	Period of training
1	Daniel AshieKotey	PhD. Entomology	University of Port Hare South Africa	3 yrs
2	Sophia Ackon	MPhil. Agronomy	KNUST	2 yrs
3	William AmoakoAntwi	BSc. Business Administration	KNUST	3 yrs

4	Walton Adu	Certificate in Agriculture	Kwadaso Agric College	2 yrs

6.1.3 Promotion: Seven (7) Senior Staff and 10 Junior Staff were promoted during the year 2014

6.1.4 Upgrading: One (1) Junior Staff was upgraded to the Senior Staff grade.

6.1.5 Retirement: Four (4) Senior Staff and two (2) Junior Staff proceeded on compulsory retirement

6.1.6 National service: Eight (8) National service personnel were posted to the Institute to undertake their national service assignment.

6.1.7 Industrial attachment: Twelve students undertook their industrial attachment at the Institute during the year under review.

APPENDIX I: PUBLICATIONS

Refereed Journal Paper

1. Asare, C.M., Owusu, E.O. and Bedeh, D.K. 2014. Vegetative propagation of Camphor tree (*Cinnamomum camphora* L.) by cuttings: Effect of shoot physiological age. Ghana Journal of Agricultural Science. Vol.47 55-59.

2. Asare, C.M., Ahiatsi, E.N., Owusu, E.O. and Bedeh, D.K. 2014. Effect of Cleopatra mandarin rootstock on bud 'take' of late Valencia sweet orange. Ghana Journal of Agricultural Science. Vol.47 51-54.

3. Egbadzor K.F, Ofori K., Yeboah M., Aboagye L.M., Opoku-Agyeman M.O., Danquah E.Y. and Offei S.K. (2014). Diversity in 113 cowpea [*Vigna unguiculata* (L) Walp] accessions assessed with 458 SNP markers. *Springer Plus: 2014, 3:*541. DOI:10.1186/2193-1801-3-541

4. Egbadzor K.F., Danquah E.Y., Ofori K., Yeboah M. and Offei K. (2014). Diversity in 118 cowpea (*Vigna unguiculata* (L.) Walp) accessions assessed with 16 morphological traits. *International Journal of Plant Breeding and Genetics. 8 (1)*: 13 – 24. ISSN 1819-3595 / DOI 10.3923/ijpbg.2014.13.24

5. Egbadzor K.F., Yeboah M., Gamedoagbao D.K., Offei S.K., Danquah E.Y. and Ofori K. (2014). Inheritance of seed coat colour in cowpea (*Vigna unguiculata* (L.) Walp). 8 (1): 35 – 43. *International Journal of Plant Breeding and Genetics.*ISSN 1819-3595 / DOI 10.3923/ijpbg.2014.35.43

6. Asiedu-Darko, E. (2014). A study of farmers seed selection methods in the Kpandai district of the northern region of Ghana. *International Journal of Agricultural, Forestry and Fisheries, Vol. 2, No. 6*, 2014.

7. Asiedu-Darko, E., Bekoe, S. (2014). ICT as enabler in the dissemination of agricultural technologies: A study in the East Akim District, Eastern Ghana. Asian Journal of

Agricultural Extension, Economics & Sociology 3(3): 224-232, 2014; Article no. AJAEES. 2014.005 Retrieved from sciencedomain international www.sciencedomain.org

8. Asiedu-Darko, E., (2014). Effect of gender, education and age on the adoption of agricultural technologies in Ashanti, Northern and Eastern regions. Journal of Applied Science and Research. 2(1): 112-118 Retrieved from http://www.scientiaresearchlibrary.com/archive.php

9. Asiedu-Darko, E., (2014). Farmers' perception on agricultural technologies a case of some improved crop varieties in Ghana. Agricultural, Forestry and Fisheries 3(1): 13-16 Obtained from http://www.sciencepublishinggroup.com/j/affdoi: 10.11648/j.aff.20140301.13

10. Boateng, S. K. (2014). Vegetative propagation of *chrysophyyllum albidum* by leaf stem cuttings. *Ghana Journal of Agricultural Science Vol.47*: 1-23

Technical Reports

1. E. O. Owusu and C. M. Mpere (2014). Effect of media on survival of dialium guineensis (Wild) shoot cutting. CSIR-PGRRI/RE/EOO/2014/80

2. E. O. Owusu and C. K. Kwoseh (2014). Assessment of farmers' knowledge and perception of *Armillaria* root-rot infection of teak in Taungya plantation systems in the Opro Forest Reserve of the Offinso Forest District of Ashanti Region. CSIR-PGRRI/RE/EOO/2014/81

3. E. O. Owusu and C. K. Kwoseh (2014). Inoculum concentration of *Armillaria mellea*in Rhizosphere mycoflora of teak in Taungya plantation of different intercrops. CSIR-PGRRI/RE/EOO/2014/82

Thesis

1. Egbadzor, K. F. (2014). Genetic control and breeding for seed size and colour in cowpea (*Vigna unguiculata* (L.) Walp). Thesis submitted to the University of Ghana, Legon in partial fulfillment of the requirement for the award of Doctor of Philosophy Degree in Plant Breeding. West Africa Centre for Crop Improvement, College of Basic and Applied Sciences University of Ghana legon. CSIR-PGRRI/TH/KFE/2014/010

2. Darkoh, K. E. (2014). Graft-take growth development of mango (*Mangifa indica*) seedlings as influenced by scion length and shade. Thesis submitted to the University of Ghana, Legon in partial fulfillment of the requirement for the award of Master of Philosophy in crop Science Degree (Horticulture). CSIR-PGRRI/TH/EDK/2014/011

3. Awuah, S. (2014). Field dynamics of growth parameters of 21 exotic accessions of sesame in the Sunayani Municipality. Thesis submitted to the Department of Genera Agriculture in partial fulfilment of the award of Higher Diploma (HND) in General Agriculture. CSIR-PGRRI/TH/SA/2011/012

4. Mohammed A., Frimpong, G. (2014). The effect of toping on fruit of okro (*Abelmosohus esculentum).* A project work submitted to the Department of Genera Agriculture in partial fulfilment of the award of Higher Diploma (HND) in General Agriculture. CSIR-PGRRI/TH/AM/2014/013

5. Osei-Kofi, P. S. (2015). Journals in the Council for Scientific and Industrial Research (CSIR) Ghana: Trend, challenges and the future. Thesis submitted to the Department of Publishing Studies, Kwame Nkrumah University of Science and Technology, Kumasi in partial fulfillment of the requirements for the degree of Master of Art in Publishing with Research CSIR-PGRRI/TH/PSO/2015/014

Appendix I1: Divisions of PGRRI

Administration Division

No.	Name	Qualifications
1	Lawrence MisaAboagye	BSc Agriculture, MSc Plant Physiology, PhD Plant Breeding and Physiology Director
2	Philip AnnorNyamah	BE.D Educational Foundation, MPA Public Administration Administrative Officer, Head of Administration
3	Emmanuel Asiedu-Darko	BA (Hons) Social Science. MPhil. Adult Education, Administrative Officer

Plant Genetic Conservation Division

No.	Name	Qualifications
1	Chris MpereAsare	BSc. (Hons) Agric., MPhil. Horticulture Senior Research Scientist Ag. Deputy Director, Head of Division
2	Matilda NtowaaBissah**	BSc (Hons) Botany, MPhil Botany Research Scientist
3	Naomi AsomaniAntwi	MSc. Biological Sciences Research Scientist
4	Samuel KwasiOwusu	Dip. Post-Harvest Technology, BSc Agriculture MPil. Post-Harvest Technology,Research Scientist

Plant Genetic Diversity Division

No	Name	Qualification
1	Samuel KwasiBoateng	BSc. (Hons) Botany, MPhil Botany,PhD. (Plant Physiology), Senior Research Scientist
2	Kenneth FafaEgbadzor**	BSc.(Hons) Agric, MPhil (Plant Breeding), PhD. (Plant Breeding), 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.(Agricultural and Environment), Research Scientist Ag. Head of Division
2.	Daniel AshieKotey	BSc. (Hons) Biology, MPhil. Entomology Research Scientist
3.	Emmanuel BoamahDuku	BSc.(Hons) Agric, MPhil Entomology Research Scientist
4.	Edmund OseiOwusu	BSc. Biology., MPhil Plant Pathology
5.	Emmanuel NorkplimAhiatsi	Dip. Ext. and Farm Management, BSc. (Hons) Agric. Assistant Research Scientist

Commercialization and Information Division

No.	Name	Qualifications
1	Dickson KorkuGamedoagbao	BSc. (Hons) Agric., MSc. Eremology Senior Scientific SecretaryHead of Division
2	Regina AtawaDogoe	BA (Hons) Arts, Post Graduate Diploma in Library Studies, Librarian
3	Paul Smart Osei-Kofi*	Dip. Archives Administration, BA(Hons) Social Science, Assistant Librarian

Accounts Division

No.	Name	Qualifications
1	Francis Adjei	BSc. Accounting, MBA Accounting and Finance Assistant Accountant, Head of Division

*MPhil/MSc Student **PhD Student

Appendix III List of Senior Staff

No.	Name	Grade
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 OpokuMensah	Principal Technical Officer
10	Salome Yeboah	Senior Administrative Assistant
11	Ebenezer AduYeboah	Senior Technical Officer
13	Evans Gayomeh	Senior Stores Superintendent
14	Emmanuel Ofori	Senior Administrative Assistant
15	Isaac Tawiah	Senior Assistant Transport Officer
16	NkansahBoakye	Senior Assistant Transport Officer
17	Samuel Abrokwa	Assistant Transport Officer
18	Godwin Hussey	Works Superintendent
19	David OppongAdu	Senior Security Officer
20	Samuel M. Konadu	Security Officer
21	Edward Adams Sangmor	Security Officer
22	Richard Aklatey	Security Officer
23	RansfordAgbedanu	Assistant Farm Manager
24	Juliana Samaah	Assistant Farm Manager
25	Peace Okumka	Assistant Farm Manager