

# MINUTES OF THE UNIJOS TETFUND CENTRE OF EXCELLENCE AND FOOD SECURITY CAPACITY BUILDING WORKSHOP ON “POTATO SEED AND WARE PRODUCTION”

Venue: TETFund Centre of Excellence and Food Security, Permanent Site, Naraguta Campus, University of Jos, Plateau State

Date: Monday, 2nd December 2024 - Friday, 6th December 2024

Theme: “Hands-on Training on Potato Seed and Ware Production”

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## DAY 1: Monday, 2nd December 2024

### Session: Seed Production

#### 1. Arrival and Registration:

The program commenced with the arrival of the Dean, Faculty of Agriculture; Heads of Departments of Crop Production and Plant Science & Biotechnology; facilitators; resource persons; and students. Physical registration was conducted from **9:00 am to 10:00 am**.

#### 2. Welcome Address and Orientation:

At **10:00 am**, the Moderator, **Dr. Engr. Ezekiel Oiganji**, welcomed participants, gave an orientation into the training, and established ground rules. A technical team was formed, comprising **Muta’a Naphtali** and **Abdullahi Muhammad**, while the media team was led by **Amos Onoja** and the Secretary was **Ejali Maria**, all undergraduate students from the Department of Crop Production.

#### 3. Recognition of Guests:

Special guests were introduced, including:

- **Prof. Paul Amaza** (Director, Centre of Excellence)
- **Prof. Nuhu Gworgwor** (Dean, Faculty of Agriculture)
- **Dr. Steven Dachi** (Head of department of crop production)
- **Prof. Ali Ahmed** (Head of Department, Plant Science & Biotechnology)
- **Dr. Daniel Lenka** (Facilitator of the day)
- **Dr. Engr. Ezekiel Oiganji** (Faculty Focal Lead)
- **Mrs. Doris Francis** (Secretary, Centre of Excellence)
- **Mr. Azap Frank** (Accountant, Centre of Excellence)

#### 4. Student Introduction:

Participants attendance:

- **19 undergraduate students** from the department of crop production Faculty of Agriculture
- **11 students** from the Department of Plant Science & Biotechnology
- One NYSC Corps member, MSc student, and PhD students.

#### **Welcome Remarks:**

- **Prof. Ali Ahmed (Head of Department, Plant Science & Biotechnology):**  
Encouraged students to actively engage in the training and emphasized its potential as a catalyst for career breakthroughs.
- **Dr. Stephen Dachi (Head of Department, Crop Production):**  
Stressed the importance of taking the training seriously as a practical foundation for future endeavors.
- **Prof. Nuhu Gworgwor (Dean, Faculty of Agriculture):**  
Appreciated the effort of the Centre of Excellence in organizing the training and emphasized punctuality and attentiveness, highlighting the hands-on nature of the program.
- **Prof. Paul Amaza (Director, Centre of Excellence):**  
Highlighted the aim of the training: to develop seed potato entrepreneurs in Plateau State and enhance income and job creation. He emphasized the integral role of seed production in agriculture and greenhouse technology.

#### **Group Photograph:**

A group photo was taken in front of the Centre of Excellence to commemorate the event. including the director centre of excellence, dean faculty of agriculture, Head f department from both departments Facilitators and resource persons and all undergraduates and post graduate students present.



## Lectures:

Lectures commenced at **11:00 am** with presentations from:

- **Prof. Paul Amaza:** *“Seed and Ware Potato Production as an Agribusiness”*
  - Discussed the aim of developing seed potato entrepreneurs in Plateau State.
  - Key points:
    - Insights into seed potato production.
    - Major challenges faced by seed potato farmers.
    - Requirements for a successful seed potato agribusiness.
    - Sources of funding and capital.
  - Duration: **11:00 am – 11:22 am**.
- **Dr. Daniel Lenka:** *“Importance of Seed Potato, Seed Quality, and Potato Production Systems”*
  - Covered:
    - Common sources of seed potato disease transmission (soil-borne, water-borne, spore-transmitted, insect-transmitted, seed-transmitted, and contact-transmitted diseases).
    - Categories of seed classification: breeder seed, foundation seed, and certified seed.
  - Duration: **11:22 am – 12:15 pm**.

## Q&A Session:

- A student from Plant Science asked about the classification of potato varieties as breeder, foundation, or certified seeds.
- Another student asked about the safety of GMO’s for human consumption.
- Dr. Daniel Lenka provided detailed responses.

## Break/Lunch:

**12:42 pm – 1:50 pm**

## Afternoon Session:

- **Dr. Daniel Lenka:** *“Potato Pest Management: Identification and Management of Pests”*
  - Discussed:
    - Common pests: aphids, potato tuber moth, red spider mites, wireworms.
    - Storage pests and diseases: dry rot (*Fusarium* spp.), soft rot (black leg), mealy bugs, rats.
    - General storage practices for pest control and Integrated Pest Management (IPM) strategies.
  - Duration: **1:50 pm – 2:25 pm**, followed by a Q&A session.

## Closing Remarks:

Dr. Ezekiel Oiganji briefed participants on the next day’s session and closed the day’s activities at **3:00 pm**.

**Closing Prayer:**

The training came to an end with a closing prayer led by **Amos Onoja**, Course Representative, Department of Crop Production.

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**Day 2 Tuesday, 3<sup>rd</sup> December, 2024**

**SEED PRODUCTION****Opening prayer**

Day 2 of the training started with opening prayer which was done by Engr.Dr. Ezekiel Oiganji by 9am,

**Opening remark**

Engr.Dr. Ezekiel Oiganji welcome the participants to the second day of the training, this was followed by a recap of day 1 of the training which was basically on the need to see seed and ware potato production as and agribusiness, the need for pest and disease management as well as importance of seed potato, classification and certification.

**Attendance**

the participants of the training includes 16 undergraduates from crop production department and 14 PG students from plant science and biotechnology department.

Participants responded by expressing gratitude with the opportunity presented to them as training like this could be a life changing opportunity, the need to present participants with certificates after the training was also suggested.

**Lectures**

Lectures started at exactly 9:40am with a presentation on the topic: *planting and management of rooted apical cuttings and tubers* this was presented by Mr. Daure by means of power point presentation. Highlight from his presentation include: site selection for planting potato, source of irrigation water, sanitation of tools to be used during planting, land preparation, preparation of seed bed, soil analysis, fertilizer application, planting and proper spacing of potato, weeding, hilling, and dehaulming of potato.

By the end of the presentation, questions was asked regarding the topic, viz

**Question:** is there any known selective herbicide for the control of weed in a potato farm

**Answer:** even though other crops such as legumes have selective herbicides (legume force), potato has no known selective herbicide for the control of weed.

The second lectures started by 11:20am on the topic: ***fungal disease of potato: chemical and non-chemical control methods, environmental consideration***. It was presented by Prof. Brains Okechalu by means of power point. Outline of the presentation include: late blight disease of potato (*Phytophthora infestans*), early blight (*Alternaria solani*), Fusarium wilt (*Fusarium spp*), powdery scab (*spongospora subterrenia*), common scab (*Streptomyces spp*).

How to identify the aforementioned pathogens, signs and symptoms as well as method of controlling the aforementioned fungal pathogens. However, he emphasize on using environmentally free method of control which will not pose any threat to biodiversity.

This session lasted for 60mins.

At exactly 12:20 pm, Prof. Brains started his second presentation on the topic: ***potato nematodes: chemical and non-chemical control, environmental consideration***. Outline of the presentation include:

- Potato cyst nematode (*Heterodera spp* and *globodera spp*). Signs and symptoms, method of spread as well as prevention method
- Root-knot nematodes (*melodogyne spp*). Signs and symptoms effects on potato and method of control.
- Stem and bulb nematodes (*ditylenchus destructor*). Identification as well as method of control
- Sting nematode.

This session lasted for 50minutes followed by questions and answers

### **QUESTION AND ANSWER SESSION 1:10pm**

**Question:** is there any chemical which will be effective in the control of both fungal and nematodes which cause disease in potato?

**Answer:** no single chemical is effective in the control of all potato pathogen; fungicides control fungi effectively while nematicides control nematodes.

**Question:** how does one differentiate fungal infection from a nematode infection?

**Answer:** physical examination only while not be enough to determine if the causative agent is a fungus or a nematode. However, pathogenicity test can be used for identification of fungal infection.

### **BREAK/ LUNCH (1:30-2:10pm)**

#### **Afternoon session**

After the lunch, the training continued with a presentation by Dr. Engr. Ezekiel Oiganji by exactly 2:15pm on the topic; *irrigation and water management during seed and ware potato production*. His outline include; understanding the water requirement of potato, quality of water used for irrigation, types of irrigation, techniques for irrigation, and advantages of the techniques. This session lasted for 45minute.

#### **CLOSING REMARKS.**

The training came to an end at 3:00pm with the closing remarks given by the moderator, Dr.Engr. Ezekiel Oiganji and a briefing on the next day's session.

#### **Closing prayer**

Closing prayer was done by Mr. Nasir Ibrahim a PG student from the department of plant science and biotechnology.

### **DAY 3: Wednesday, 4th December 2024**

#### **(SEED AND WARE PRODUCTION)**

##### **1. Arrival and Opening Remarks:**

Participants arrived and settled between **9:00 am – 9:20 am**. The Moderator, **Dr. Ezekiel Oiganji**, delivered an address, urging participants to take the training seriously and develop mentorship relationships within their niches.

#### **Attendance**

the participants of the training includes 18 undergraduates from crop production department and 9 PG students from plant science and biotechnology department.

## 2. Introduction of Facilitators:

Facilitators included:

- **Engr. Dr. Durotimi John (Associate Professor, Soil/Water & Plant Dynamics)**
- **Mr. G.L. Daure (Department of crop production, faculty of agriculture)**
- **Prof. Brains Okechalu (Department of plant science and Biotechnology)**
- **Dr. Vou Moses Shutt (Department of plant science and Biotechnology)**

## 3. Lectures:

- **Prof. Brains Okechalu:** *“Seed Selection and Treatment Methods”*
  - Outlined:
    - Criteria for selecting seed potatoes: certified, disease-free, uniform size, well-sprouted.
    - Treatment methods: pre-planting and post-harvest treatments, including acid mercuric chloride and formaldehyde.
    - Risk assessments for seed treatments.
  - Duration: **9:34 am – 10:17 am.**
- **Engr. Dr. John Durotimi:** *“Storage Methods and Postharvest Handling”*
  - Discussed:
    - Proper storage conditions (ventilation, temperature control, avoiding sunlight).
    - Signs of spoilage and sorting practices.
    - Curing potatoes for long-term storage.
  - Duration: **10:20 am – 10:53 am.**
- **Dr. Vou Moses Shutt:** *“Bacterial and Viral Diseases of Potato”*
  - Covered:
    - Key bacterial diseases: Ralstonia (bacterial wilt), Dickeya and Pectobacterium (soft rot and black leg), Streptomyces scabies (common scab).
    - Management strategies under Integrated Pest Management (IPM).
  - Duration: **10:54 am – 12:00 pm**, followed by a 14-minute Q&A session.

## 4. Break/Lunch:

**12:00 pm – 1:14 pm**

## 5. Afternoon Session:

- **Engr. Dr. John Durotimi:** *“Land Preparation and Greenhouse Farming”*
  - Topics included:

- Land selection criteria: soil pH, temperature, rainfall, altitude, and nutrient requirements.
  - Greenhouse setup and materials used.
- Duration: **2:20 pm – 3:00 pm.**
- **Mr. G.L. Daure: “Seed Selection and Pre-sprouting Techniques”**
  - Discussed criteria for seed potato selection and techniques for enhancing yields.
  - Duration: **3:00 pm – 3:20 pm.**

## 6. Closing Remarks and Prayer:

The day’s session ended with closing remarks by Dr. Ezekiel Oiganji. Closing prayer was led by **Abba Joseph**, a postgraduate student of Plant Science & Biotechnology.

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## DAY 4

**THURSDAY, DECEMBER 5<sup>TH</sup> 2024**

### (WARE PRODUCTION)

Day four of the training starts by 9:15am with a recap of day three; this was done by the moderator Engr. Dr. Engr. Ezekiel Oiganji, basically on the use of green house for potato production, the factors to consider before sitting a green house, the types of greenhouse as well importance of using green house for seed and ware potato production.

### Attendance

The participants of the training includes 16 undergraduates from crop production department and 12 PG students from plant science and biotechnology department.

### LECTURES

Shortly after the recap, the first lecture of the day start at exactly 9:40am on the topic; ***good agronomic practice: planting date, spacing, depth of planting, hilling, weed control, fertilizer application.*** By Mr. G. L. Daure, the facilitator suggests that low yield in potato production maybe due to poor agronomic practice. Hence, this can be mitigated with good agronomic practice. This can be achieved through seed selection for desired traits, land preparation (land clearing, plow, harrow and ridge), planting/ planting depth, fertilizer application, hilling, and weed control harvesting and tuber selection for seed or ware storage.



This session was followed by questions, they include

**Question:** is hilling being capitalize on to obtain high yield in potato production?

**Answer:** yes, because hilling helps in tuber bulking

**Question:** what is the effect of cutting big tubers for planting does it affect sprouting and yield?

**Answer:** cutting potato tuber is not advice as it predispose it to disease which potentially reduce the yield

The second lecture started by 10:30am on the topic: *seed potato multiplication techniques*. By Dr. Lenka, his outline include: seed multiplication, seed multiplication ratio (1:8 for seed and 1:15 for ware potato), seed multiplication techniques (in-vitro, sexual reproduction, green house and multiplication in the field). The second lectures ended by 11:10am

The next facilitator Dr. Vou Moses Shutt presented on the topic: *harvesting timing and quality handling* her outline includes; proper timing for harvesting, dehauling, harvesting curing potato and disinfection of tools and facilities, this lasted for 40 minutes,

At exactly 11; 50am, the next topic; *viral disease of potato and control method* was presented by Dr. Vou Moses Shutt, she explained that about 50 different viruses and 1 viroid are known to cause disease in potato, but the most important viral disease of potato are: potato leaf roll virus, potato virus Y, potato spindle tuber viroid, alfafa mosaic virus, potato virus S and M. viral disease management should be done employing the integrated pest management strategy rather than focusing only on chemicals

**Questions and answer session 12:10 pm.**

**Question:** why do we need to control aphids?

**Answer:** they are carriers of plant pathogenic virus.

After the question an answer session, participants gave there honest opinion on the training, one of the participants a 500L students is of the opinion that the training is educative. However, it will have been better if there was practical. Another participant is of the opinion that day one of the program was a bit abstract but gradually, she understands everything with the aid of pictorial representation of the various topics covered.

Miss Sumi-lot Amabel a PG also commented on the need for a practical session to be organized, as this will equip the participants with first hand knowledge of the concepts being discussed. Mr Eguda Reuben another PG student expressed gratitude for being part of what he termed most educative, interesting yet free training. This is second to none in the country. However, he suggested participants can volunteer to partake in helping farmers or visit potato research institutes to have practical knowledge.

### **BREAK/ LUNCH (12:30-1:10pm)**

#### **Afternoon session**

After the lunch, the training continued by 1:40pm with a presentation from on the topic; *management of bacteria disease of potato* by Dr. Vou Shutt. The facilitator explained that the approach is to prevent the spread of bacteria rather than curing the disease, bacteria disease of potato such as bacteria wilt, blackleg and soft rot, ring rot, common scab and be managed using integrated pest management strategies such as the use of resistant cultivars, bacterial free seeds, cultural practices, biological method of control and quarantine.

#### **CLOSING REMARKS.**

The training came to an end at 1:44pm with the closing remarks given by the moderator, Dr. Engr. Ezekiel Oiganji and a briefing on the next day's session.

#### **Closing prayer**

A minute silence was observed while each participant silently communicated his/ her prayers

### **GRAND FINALE DAY 5 - 6th December 2024**

**(ware production)**

#### **Morning Session (9:00 am - 11:15 am)**

**The day's training commenced at 9:00 am with a recap and feedback session led by Engr. Dr. Ezekiel Oiganji .**

#### **Lecture 1: Storage and Best Handling Practices**

**Presenter: Dr. Daniel Lenka.**

### **Topic Overview:**

- Factors affecting potato storage (respiration, microorganisms, variety, harvest season, exposure to heat, ventilation, physical injuries, evaporation)
- Pre-storage activities (grading and sorting)
- DLS storage systems
- Different potato storage systems and structures

### **Lecture 2: Marketing, Pricing, and Value Addition in Potato Production (Nigerian Context)**

**Presenter: Dr Daniel Lenka**

### **Topic Overview:**

- Market channels (local, wholesale, retail, institutional buyers, export markets)
- Potatoes marketing channels in Nigeria (farmer, rural assembler, rural commission agent, urban assembler, wholesaler, urban retailer, consumers)
- Producer price share of potato prices
- Marketing costs and margins in different marketing channels in Nigeria
- Challenges and opportunities in pricing ware potatoes in Nigeria
- Value addition in potato production (common value-added products and benefits)

### **Next Lecture: Climate Smart Agriculture and Nematode and control methods and management.**

**Presenter: Prof. Brains Okechalu**

### **Topic Overview:**

- Overview of climate-smart agriculture
- What is climate change?
- Crop weather calendar
- Maize weather calendar based on the 2020 seasonal rainfall prediction in different local governments in Plateau state

## Lecture 2: Nematode and control methods and management, Viz

- Potato cyst nematode (*Heterodera spp* and *globodera spp*). Signs and symptoms, method of spread as well as prevention method
- Root-knot nematodes (*melodogyne spp*). Signs and symptoms effects on potato and method of control.
- Stem and bulb nematodes (*ditylenchus destructor*). Identification as well as method of control
- Sting nematode.

Question and answer session was followed after each lecture headed by each facilitator.

### **Feedback from participants.**

Three participants each from both departments were chosen to give a feedback on how the training has been thus far.

Participants expressed thanks to the Director Centre of excellence, facilitators and resource persons for organizing and making this impactful training with topnotch modules and outlines carefully selected for their establishment in potato industry, as some participants are researchers in the field, marketers, while the undergraduate students with the enlightenment given are ever willing to go into this venture, whether direct production, seed production, ware production, consultation on disease management of potato, value addition or been a middle man. These feedbacks were recorded by the media team for reference and planning of the next hands on training for students, even though the students wanted an open field trip as part of the training.

### **Vote of thanks by the director centre of excellence.**

Director Centre of excellence, Prof. Paul Amaza, He thank all the resource persons and facilitators for making out time to give students their best as they were carefully selected as the best and most experienced in Potato production and research. He encouraged the undergraduate students to see opportunities available to them after graduation and not to wait for white collar jobs. And also apologized for not making taking the students for the proposed field trip as modalities were not in place for that purpose, but he promised that arrangements would be made to that effect.

### **Presentation of certificates to participants: (12:15 am- 12:17am)**

Certificates of participation were presented to participants from both departments presented by the Director, centre of excellence, Prof. Paul Amaza, Dr. Daniel Lenka, Prof. Brains Okechalu.

## Closing remarks

The Moderator of the training, Engr. Dr. Ezekiel Oiganji thanked his Boss, Prof. Paul Amaza for the great opportunity to serve under him and facilitate the workshop without any pressure. And for putting together this workshop which was “self funded” by the centre of excellence.

He also thanked all the resource persons those present and absent for giving in their best.

## Closing prayer:

The training ended at exactly 12:25pm with the closing prayer led by Ejali Maria a crop production student followed by the last lunch for the workshop.

## PHOTO GALLERY.



*Participants giving feedback on the workshop on the final day.*



**Sample Certificate presented to participants at the end of the training.**



**Presentation of certificate by Prof. Amaza Paul. Okechalu.**



**Presentation of certificate by Prof. Brains**



**Dr. Vou Moses Shutt presenting her lectures.**





***Students from plant science and biotechnology. Students from faculty of Agriculture, crop production.***



***Cross section of students during lectures.***

***Prof.Brains Okechalu presenting his lectures.***



***Lecture time.***



***Engr.Dr. Ezekiel Oiganji ,moderating the programme. Prof.Paul Amaza, presenting his lectures.***



***Mr.Gambo Daure presenting his lectures.***



***Dr. Daniel Lenka presenting his lectures.***