

The background of the entire page is a photograph of a hydroponic farm. In the foreground, a woman with dark hair tied back, wearing a red and blue plaid shirt, is looking down at a plant. In the background, another person is visible, holding a smartphone. The plants are growing in a structured, indoor environment with green leaves and some reddish-purple foliage.

Training Curriculum

Advanced

2022/2023

SOILLESS FARM LAB

Technology | Business | Opportunities

Advanced Boot camp Training

This is for growers with great experience and wish to diversify or increase knowledge in a specific area, this also covers specialties in various parts of CSA. These include lessons in tissue culture, and the class takes place on our farm (Abeokuta) and partner farms (Abeokuta and Ibadan). This is a 5 day class or 4 Saturdays classes, the fee for this is two million naira (**#2,000,000**). Below is the syllabus;

Greenhouse Plant Physiology: Explores the way light, temperature and humidity interacts with horticultural crops and their connection to greenhouse plant physiology & environmental management:

- Light a plants eye view (UV, PAR, LUX, Global, Radiation Intensity, DLI & Sum)- basic plant processes
- temperature & photosynthesis respiration
- Plant transpiration principles
- Mollier diagram (psychometric chart)
- Relative humidity vs. humidity deficit
- Plant development

Water Quality, EC & pH: Participants will be able to assess water quality, characteristics of different treatment systems and their application, and understand the principal factors involving EC & pH incorporation:

- Hydroponic system requirements
- Types of hydroponic systems
- Factors influencing water demand
- Osmosis and other root influences
- EC & pH change through systems
- Practical management
- Raw water treatment systems
- Water treatment options (RO, UV, UF, Chemical, etc.)

Greenhouse Environmental Management: Participants will be able to understand the principal factors affecting environmental management principles, systems and their management:

- Outside conditions effects on inside conditions (temperature, wind, radiation, rain)
- Grower's tools to influence environment (heating, cooling, fans, screens, climate control systems, fogging, etc.)
- Ventilation principles
- Practical grower examples (case studies)
- Temperature integration

Plant Structure, Nutrition & Nutrient Management: Participants will be able to assess plant structure, photosynthesis, nutrition, characteristics of different root-zone factors and their application, and understand the principal factors involving Nutrient Management (including basic formula calculations):

- Functions of nutrient elements

- Nutrient uptake principles
- Plant disorder symptoms, deficiencies & toxicities
- Nutrient management
- Difference between root zone & input solutions
- Interpretation of root zone nutrient analysis
- Adjusting input solution based on drain analysis

Irrigation, Media's Manager: Explores the impact irrigation strategies have on growing media and crop production (includes EC, pH, Water Content & Drain percentage):

- Irrigation strategies to match growing media
- Irrigation strategies to match water uptake and drainage
- Irrigation strategies to control root-zone Water Content & EC
- Plant evaporation & transpiration
- Practical calculations for irrigation capacity, required pump capacity, maximum number of irrigation valves

Media Types and their Characteristics: Participants will be able to assess media types, characteristics, and their application, and understand the principal factors affecting their selection:

- Ideal media properties
- Void space, porosity, aeration, CEC, pH, etc.
- Commercial hydroponic media types and their characteristics

Crop Registration & Plant Balance, A Professional Approach to Growing: Explores the monitoring, recording & responding approach to good crop balance (includes 'reading' a crop and tools to change balance):

- Managing plant balance
- Crop assessment (evaluating a crop)
- Crop steering (changing crop balance)
- Crop reading (what a crop tells a grower)
- Crop data collection and measurements
- Plant vigour and balance chart

Common Greenhouse Pests, Diseases, & IPM: Participants will be able to assess common pests and characteristics of different diseases, and understand the principal factors involving Integrated Pest Management and how to implement bio-controls to control common greenhouse pests (i.e. spider mites, whitefly, thrips, fungus gnats, aphid, russet mite, broad mite, caterpillars, etc).

- Integrated pest management program
- Sources of plant pests & diseases
- Crop hygiene - insect life cycles
- Plant fungal, bacterial & virus conditions
- Common physiological problems and their treatments

Oxygen Enrichment of Greenhouses: Explores the benefits, costs, geometry and equipment required to correctly enrich a greenhouse with carbon dioxide for maximum crop growth & quality:

- CO2 enrichment principles
- Influence of light & temperature on CO2 enrichment
- Enrichment: technology options; targets & strategies; and modeling with 'Tomsim' (CO2 crop modeling software)

Recirculation, how to convert to a Closed System: Explores how to convert a media based free-drainage system to a closed recirculation system. Demonstrates how growers can easily save 40% on water use, 60% on fertilizer use, maintain balanced root-zone nutrition and become environmentally sound & responsible:

- Design principles for closed systems
- Savings and costs estimates
- Calculate annual water and fertilizer savings
- Pre-EC set-points calculations for various crops
- Nutrition in closed systems
- Comparing analysis with standard reference
- Basis for corrective action
- Sterilization options costing
- Sterilization types (heat, UV, slow biological, Ozone and other chemical systems)

Greenhouse Crop Protection Principles: Understand basic principles of crop spraying (calculate volume, speed and pressure) for high volume, low volume and ultra-low volume systems and a suitable vertical & horizontal spray system for greenhouses crops:

- Chemical crop protection options (Dripping, Spraying / Fogging / LVM, Dusting, Sulphur Evaporators, Traps (lamps, lights, glue, pheromones)
- Spray techniques and assessments
- Calculate walking speed for vertical and horizontal spraying
- Characteristics of a good greenhouse spray system

Implement a Hydroponic Maintenance Program: Monitor plant health, monitor the Hydroponic environment, monitor the nutrient solution, and perform routine maintenance checks, maximizing greenhouse efficiency and energy conservation:

- Daily measurement schedule
- Fertilizer measurement
- Routine weekly, monthly & annual maintenance tasks
- Preventative maintenance and frequency plan & log
- Asset registers

NFT Systems: Explores best practice model for modern Nutrient Film Technique (NFT) systems

- Fundamental principles and system types
- Gully Profiles (length, width, slope, etc.)
- Control & dosing equipment
- Water, EC, pH, nutrition, oxygen management
- Disease management & sterilization options
- NFT system design principles