

The type of design used was a totally randomized design (CRD) which was a formal experimental set-up. But actually the experiment was carried out on three replications of every cultivar and they all were grown under the same environmental and management conditions and no extreme variations were added.

2.4 Nutrient solution preparation and management

The nutritional needs of the plants were satisfied using the modified Murashige and Skoog (MS) nutrient formulation (Murashige and Skoog, 1962). The nutrient solution was first centred down into two separate stock solutions (Solution 2 and Solution 3) to prevent precipitation of calcium and phosphate salts. Table 1 gives the detailed composition of these stock solutions.

To prepare the working solution, Solution A (500,300 mL) and Solution B (125,300 mL) were mixed in 25,000 mL of water in a 30,000 mL reservoir. The resulting nutrient solution was pumped continuously in the Nutrient Film Technique (NFT) system until the cultivation period ended.

Table 1 Nutrient solution composition

Concentration of Nutrient Solution-A	
Component	Concentration (g/L)
KNO ₃	45.30
Ca (NO ₃) ₂	26.70
NH ₄ NO ₃	1.33
Fe-chelate (6%)	3.00
Concentration of Nutrient Solution-B	
KH ₂ PO ₄	20.00
MgSO ₄	20.00
K ₂ SO ₄	15.30
KNO ₃	14.70
MnSO ₄	0.16
ZnSO ₄	0.23
B	0.23
CuSO ₄	0.03
Na ₂ MoO ₄	0.01

Note: Adopted from Murashige and Skoog (1962)

Solution A was made with the dissolution of 114.12 g of nutrients in 2,500 mL of distilled water and Solution B was made by dissolving 0.605 g of nutrients in 500 mL of distilled water. Table 1 shows the chemical composition of each constituent and its concentrations in both stock solutions in details. Solution A contained mainly nitrogen, calcium, potassium and iron, and Solution B contained phosphorus, magnesium, potassium and essential micronutrients needed to grow the plant.

To prepare the final working nutrient solution, 500 mL of Solution A and 125 mL of Solution B were mixed with 25,000 mL of water in a 30,000 mL nutrient reservoir. Throughout the cultivation period, the nutrient solution was in circulation inside the nutrient film technique (NFT) system. The nutrient solution was observed and corrected periodically to maintain its status in terms of electrical conductivity (EC) and pH to provide the best environment to grow swamp cabbage.

2.5 Monitoring of pH, EC, and TDS

Digital meters were used to measure the pH, electrical conductivity (EC) and total dissolved solids (TDS) of the nutrient solution periodically. The pH level was kept at 6.0-7.0 and is the ideal range of swamp cabbage growth; slight pH increments were corrected with the addition of vinegar. The EC was maintained at 0.8-1.0 MS/cm in the early stage of growth and at 1.2-1.8 MS/cm in the later stages, as recommended in the standard hydroponics. Whenever EC was much higher than the desired level, water was diluted and when EC was much lower than desired, nutrient solution was added.