Woorowo recently planted on the field

C. Sprouting: Well treated cuttings often start producing roots at 7 days after planting while the first set of new leaves is produced at about 10-15 days after planting.

D. Staking: The growing plant must be staked to obtain higher and good quality leaves. Staking helps to minimize leaf disease infection and thereby increase income. Staking is done by using bamboo sticks or by using wood with trellis.

Woorowo growing under natural shade

Woorowo growing under artificial shade

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CAPE BRETON UNIVERSITY

UNIVERSITY OF MANITOBA

NI-CAN-VEG Project for Food security

Cultivation of WOOROWO

(*Solanecio biafrae* or *Senecio biafrae*)

- ✓ Site selection
- ✓ Land preparation
- ✓ Planting operations
- ✓ Seed germination

Foreign Affairs, Trade and Development Canada | Affaires étrangères, Commerce et Développement Canada

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A. Site selection and land preparation: Woorowo is a sciophyte , otherwise called shade-loving plant. Select land that is rich in organic matter with loam texture and neutral pH. As much as possible, avoid water-logged soils. It does better under natural shade at the floor of trees than under artificial shade. Traditionally in southwest Nigeria, *Woorowo* grows in the wild at the floor of cacao plantation. Clear the land of vegetation, remove stumps and debris, mark out the plots and prepare the seeding beds. The seeding beds are usually 2 m × 3 m or 3 m × 3 m or 3 m × 4 m or any suitable dimension. Ensure that the beds are well tilled, pulverized and of fine tilth.

Seeds bed prepared for planting Woorowo under natural shading

B. Planting operations:

Method of propagation: *Woorowo* is a trailing climber and it is propagated by vegetative method using stem cuttings. The plant is known to produce seeds after 3-4 years of uninterrupted growth but the seeds have less than 0.5% viability. Therefore propagation by seed is not a reliable method. Cuttings are prepared by selecting mature vines (stems) then cut into 15 cm length. Each cutting must have 4-6 nodes to enhance the underground and above-ground sprouting. The mature and vigorous cuttings sprout better and faster than weak and tender cuttings.

Woorowo vines prepared for planting

ii. **Cutting treatment**: The cuttings are treated by dipping the vines in insecticide-fungicide mixture formulated as Seed Plus 30 ws, Cibadrex, Seedrex, or Apron Plus to prevent attack by insects and fungi. Prepare the mixture by dissolving one sachet of insecticide-fungicide powder in one litre of water. The chemical is toxic, therefore care should be taken during handling. Necessary precautions during preparation and application include the use of hand gloves, plastic apron, nose and mouth guard and rain boots. The chemical container should be properly disposed of after use. Wash hands, face and feet thoroughly immediately after application.

iii. **Planting method**: The stem cutting (15 cm length) is planted immediately after treatment by spot planting method. The older portion of the cutting is inserted into the bed with at least 2-3 nodes buried in the soil.

vi **Planting density**: Planting is done at 25 cm x 50 cm or 50 cm x 50 cm. For 2 m × 3 m plot, we expect a population of 50-60 stands.

- The leaves are eaten as a separate dish or sauces together with other ingredients including pepper, tomato, onions, locust beans and fish or meat.
- The vegetable is rich in iron and other mineral elements that support human health.
- *Woorowo* is known to contain high amounts of anti-oxidant components (tocopherols, flavonoids, phenolics and ascorbic acid) and it also possesses high value of harmful radical scavenging activity.
- At the local level in southwest Nigeria, extract from *Woorowo* leaf is used to stop bleeding.

J. Importance of Woorowo to human health

- The leaf is rich in vitamins A, B-group (folic acid, niacin thiamin, riboflavin), C and E; and minerals. It is also rich in iron and potassium, hence the contribution to growth and the maintenance of human health.
- The leaf contains high amounts of antioxidants (ascorbic acid, tocopherols and flavonoids) which fight cellular damage and help mitigate the risk of heart disease, cancer, parkinson's disease, atheroscienrosis, heart attack and Alzheimer's disease.
- It contains dietary fiber. Fiber which is an important component found only in plant foods. As part of a healthy diet, fiber helps scour bad cholesterol out of the arteries, thus lowering risk of heart disease.
- Fiber keeps digestive system running smoothly.

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(*Solanecio biafrae* or *Senecio biafrae*)

- ✓ Field management
- ✓ Bio-control of pest and
- ✓ Importance

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E. Field Management:

i. **Weeding:** Remove weeds manually when necessary (avoid the use of herbicides).

ii. **Fertilizer application:** Apply organic fertilizer (farm yard manure) supplemented with mineral fertilizer e.g. NPK or Urea.

iii. **Irrigation**: Water supply is critical for realizing optimum leaf yield of *Woorowo*. Irrigate when there is shortage of water, especially during the dry season vegetable production. Irrigation should be done early in the morning and late in the evening.

iv. **Staking:** The growing plant must be staked to obtain higher and good quality leaves. Staking helps to minimize leaf disease infection and thereby increase income. Staking is done by using bamboo sticks or by using wood with trellis.

F. Bio-control of pest: Use neem plant extract (*Azadiractha indica*) to control insect leaf defoliators and other pathogenic infections when noticed. The neem plant is called "dongoyaro" in southwest Nigeria. Neem leaf extract is very effective in controlling insect pests of vegetables.

Preparation and application of neem extracts

Collect mature neem leaves and rinse with water to remove contaminants. Fill one *Kongo* with fresh neem leaves (about 200 g). Add into a pot containing ten *Kongos* of water (5L) and boil (100 °C) for five minutes (caution: over boiling may render it ineffective). Allow the extract to cool and then sieve to remove the leaves. Dilute the extract at 1 part into 10 parts of water (10%) and apply to the plants. Repeat application two weeks after.

G. Harvesting: Harvesting commences at about 35 days after planting. Harvesting is done by cutting the tender shoot of *Woorowo* and subsequent harvestings are done on fortnightly basis or once in three weeks to allow for production of more leaves. Harvesting can continue for as long as the condition is conducive for the vegetable to grow, usually up to 4 years.

i. **Expected leaf yield**: 30 kg/6 m^2 after 10 successive harvests.

ii. **Expected income**: N 3400/6 m^2 during the raining season and: N 7400/6 m^2 during dry season.

H. Nutrition: Parts of the plant consumed are young leaves and fresh vines. The fresh leaves are good source of dietary fibre, minerals, vitamins and antioxidants.

I. Uses of *Woorowo* vegetable

- Fresh and tender shoots are cooked and consumed as a vegetable