Ethiopian mustard – New leafy vegetable crop in Botswana

Background Information
Ethiopian mustard is a leafy crop which is like rape and kale. This vegetable has sharp garlic like odour when cut. This vegetable is common in most African countries example Zambia, Kenya, Tanzania where like in Botswana is mainly use as a leafy crop. However, in developed countries it is used for oil production.

Studies done in Botswana have revealed that in terms of leaf yield, Ethiopian mustard compares well to rape and kale. When the plant start flowering, the leaf area start reducing therefore making the leaves not marketable. One advantage of Ethiopian mustard compared to rape and kale is that it produces seed therefore could reduces problem of seed availability and affordability.

Climatic requirements
Ethiopian mustard prefers a cool weather. Planting of this crop when the temperatures are high encourages flowering therefore reducing the yield of the crop.

Soil preparation
The soil must be prepared to obtain a fine tilth and the ground must be level.

Soil and fertilizer requirement
The crop grows well on a wide range of soils. On sandy soils, organic matter should be added. A pH range of 5.5-7.0 is required for optimal crop growth. A basal dressing of 62.9 kg/ha N and 94.2 kg/ha P and 62.9 kg/ha K will be applied as a compound fertilizer or single fertilisers prior to transplanting or sowing and additional 42 kg/ha N should be applied thereafter at an interval of three weeks as long as harvesting continues. However, the actual amount of fertilizers to be applied will depend on the soil analysis results.

Sowing and propagation method
Ethiopian mustard respond well to direct seeding but transplants will do well. For direct seeded crop, sow 410 – 500g of seed per hectare and later thin after establishment to the required plant population. For the transplanted crop, sow 210 – 250 g of seed in the seedbed or seedling trays for planting in a hectare for plants that are spaced at 50 cm between rows and 40 cm. Plants can be thinned or transplanted when they are 10 cm high. Plants or seed must be spaced at 40 cm between plants and 50 cm between rows. A spacing of 50 cm between plants and 50 cm between rows can also be used.

Harvesting
Leaves are picked as they reach a desired size but should not be left to over grow as the quality will be lost. For selling, the leaves are made into bundles of 0.25 kg – 0.5 kg.

Yield
Yield normally ranges from 35 to 75 tonnes per hectare. Ethiopian mustard normally flowers during warmer months therefore reducing the harvest period and yield.
Diseases and pests affecting Ethiopian mustard

1. **Diamond Back moth (larvae),* Plutella xylostella* (L)**
   Small light green caterpillar feeding on the underside of leaves. Eats the green tissue of leaves leaving holes. Spins a cocoon to pupate.

   **Control**
   Chemicals: Dichlorvos, deltamethrin, Gamma – BHC, carbofuran, methomyl, cypermethrin, endosulfan.

2. **Cabbage Aphid (*Brevicoryne brassicae*)**
   Small pear-shaped soft bodied insects with long legs and antennae. Green or bluish-grey in colour. Aphids suck sap from the leaves and stems and form large compact colonies. High infestations lead to stunted plants and yield reduction.

   **Control**
   Chemicals: Chlorpyrifos, dementon-S-methyl, dimethoate, Gamma-BHC, endosulphan.

3. **Bagrada Bug (*Bagrada hilaris*)**
   Small black shield bug with orange and yellow spots with an orange cross on the back. The adults are winged, male and female are often running around attached each other and facing away from each other. Nymphs are red with dark spots and band around the abdomen. It severely feeds on the crucifers especially at seedling stage. They suck the sap from the tender leaves causing the leaves to die.

   **Control**
   Chemicals: Carbofuran, Gamma-BHC.

Diseases have not been observed so far in Botswana.

**Guide to Fertilizer Calculation**

\[
\text{Amount of fertilizer to apply} = \frac{\text{Nutrient requirement} \times 100}{\% \text{ nutrient in fertilizer}}
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### Amount of nutrient (%) in some fertilizers

- **Urea** = 46% N
- **Lime Ammonium Nitrate** = 28% N
- **Ammonium sulphate** = 21% N
- **Single superphosphate** = 10.5% P
- **Potassium chloride** = 50% K
- **2:3:2 (22)** = 6.3% N
  = 9.4% P
  = 6.3% K

### Examples

A. 62.9 kg/ha N using urea.
   Amount of urea to apply = \( \frac{62.9 \times 100}{46} = 136.7 \) kg

B. 62.9 kg/ha N using ammonium sulphate
   Amount to apply = \( \frac{62.9 \times 100}{21} = 299.5 \) kg.

C. 62.9 kg/ha K using Potassium chloride
   Amount of KCL to apply = \( \frac{62.9 \times 100}{50} = 125.8 \) kg

D. 94.2 kg/ha P using Single superphosphate
   Amount of SSP to apply = \( \frac{94.2 \times 100}{10.5} = 897.1 \) kg

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Department of Agricultural Research

**Ethiopian Mustard Production**

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