MoFA

Modernizing Agriculture in Ghana

REPUBLIC OF GHANA

DIRECTORATE OF AGRICULTURAL EXTENSION SERVICES (DAES)

Cucumber PRODUCTION Guide

2021

CUCUMBER PRODUCTION GUIDE

This production guide was developed to complement existing Information, Education and Communication (IEC) materials available on the Agronomy of selected commodities under the "Planting for Food and Jobs" campaign. It is designed for use by Agricultural Extension Agents and other farmers who can equally use to train their colleague farmers.

ACKNOWLEDGEMENT

The Directorate of Agricultural Extension Services would like to acknowledge the contributions of staff, Regional Directors, Regional Extension Officers who contributed directly or indirectly to the development and printing of this production guide.

The Directorate would also like to thank colleagues from other Directorates of the Ministry of Food and Agriculture who reviewed and edited the final draft copy of the production guide prior to printing. We appreciate the untiring efforts of the following people;

Paul Siameh	**Director, DAES, MoFA**
Prosper Akpablah	**DAES – ISU, MoFA**
Collins Oppong	**DAES – ISU, MoFA**
Esther Agyekum	**DCS, MoFA**
Hannah Serwaa Nuamah	**PPRSD, MoFA**
Portia Tandoh	**DAES – ISU, MoFA**

The Directorate is also grateful to the Modernizing Agriculture in Ghana (MAG) programme for the financial support towards the development and printing of this production guide.

Permission for commercial production should be sought from the:

DIRECTOR,

DIRECTORATE OF AGRICULTURAL EXTENSION SERVICES (DAES)

P. O . BOX M 37 MINISTRIES – ACCRA

DIGITAL ADDRESS: 4 BEACH ST, GA-144-5182

TABLE OF CONTENT

1.0 INTRODUCTION

Botanical name: *Cucumis sativus*

Cucumber is believed to be indigenous to an area in India between the Himalayas and the Bay of Bengal and was introduced to West Africa by the Europeans in 1940.Cucumber (Cucumis sativus) is a creeping vine belonging to the Cucurbitaceae family.

In Ghana, cucumber can be eaten raw as a relish or used in the preparation of vegetable salad, stew or sandwiches. Cucumber fruit contains about 95% water and is recommended as a natural diuretic and for body building. It is low in Vitamin C, and Potassium while the skin contains some amount of vitamin A. The fruit is also used to produce facial mask, body creams, lotions and shampoo. It helps to reduce high blood pressure to healthier levels when eaten regularly and also helps to cure kidney ailments (Thus cucumber is not only needed as food for good health but also as raw material in the cosmetic industry**).**

A typical cucumber farm

2.0 SITE SELECTION /CLIMATIC REQUIREMENTS

Cucumber is a warm-season season crop that can tolerate high temperatures in the presence of sufficient moisture but cannot withstand waterlogged conditions. Cucumber prefers relatively high temperatures (20ºC-25ºC) thriving best during the dry season. However, extreme temperatures (34ºC and above) may cause bitterness in the fruit. Cold night temperatures are required for the development of female flowers. The preferred soil is well-drained sandy loam which is rich in organic manure with a pH of 6.5-7.5.

3.0 SEED/VARIETAL SELECTION

Buy certified seeds from reputable agro-input dealers, MoFA, CSIR-Crop Research Institute. Some of the improved varieties are; Palmetto, Straigt Eight, Long Green, Black Diamond, Marketer, Ashley, Tokyo F1 and Poinsett. The seeding rate is 2kg/ha.

3.1 Germination Test

Conduct a germination test before planting to be sure of the viability of your seed lot.

- Pick 100 seeds from the lot
- Sow in a seed box or bed.
- Count number of seeds germinated after 5-7days
- 85%-95% means seeds are very good but below 85% increase seed rate to make up for the losses.
- Discard seeds with a germination rate below 60%.

4.0 LAND PREPARATION

Cucumbers can be planted on mounds, beds or ridges. Prepare soil and incorporate well-decomposed manure or compost.

5.0 PLANTING

- Seeds are sown directly (2-3 seeds) on the field beds or ridges/mounds.
- On beds (3m x 30m) seeds are sown at the corners so that the vines grow toward the center. On ridges, spacing of 90cm between ridges and 60cm-90cm within rows are used. Thinning is done to obtain one plant per hill at 2 weeks after germination.
- On the other hand, seeds can be sown in seed trays and transplanted onto the field.

5.1 Training

Plants that may be grown on a trellis or individual plants may be staked with two stakes and trained to climb. This prevents foliage and fruit from coming into contact with soil minimizing foliage disease and fruit rot. When the plant has produced 5-6 leaves, the terminal bud must be nipped to promote the production of more branches.

Training Cucumber

Pinching-out also known as stopping is the removal of the growing point of a stem to encourage lateral shoots or side branches which will eventually bear more flowers. It redirects auxin movement from the apical part to areas below the plant to stimulate lateral buds development.

5.2 Irrigation

Water as often as possible especially in the dry season. Irregular irrigation results in bitter fruits.

6.0 FERTILIZER RECOMMENDATION

Use soil test as a guide to fertilizer application.

- ❖ Cucumber responds well to soils with relatively high organic matter content. The soil should receive a dressing of up to 8t/ ha of well-decomposed poultry manure during the early stages of soil preparation. Broadcast and mixed with soil at least 2weeks before planting.
- ❖ In high rainfall areas, apply lime at a rate of 1-2 tons/ha during land preparation to improve calcium levels and reduce soil acidity.
- ❖ Cucumbers require a good supply of nitrogen for high yield of well-shaped and well-coloured fruits adding manure to the soil before planting using 10 buckets full per bed (10L capacity bucket) by /30 tons per hectare.
- ❖ At planting, apply 15-15-15 NPK compound fertilizer at 250kg/ha, 5g/plant). Three weeks (3wks) after planting, apply100kg/ha of Urea and repeat 3 weeks later.

.

7.0 WEED MANAGEMENT

The field must be hoed periodically to control weeds. Hoeing must be done carefully at the flowering and fruit set. Pre-emergence weedicides may be applied before seeding.

8.0 PESTS AND DISEASES MANAGEMENT

8.1 PESTS;

(i) Fruit flies (Dacus aramatus, D. biittatus, D. ciliates, D. punctatifrons, D. vertebratus and Zeugodacus (=Bactrocera) curcubitae)

Symptoms

- Look for signs of infestation which include dot-like scars, fruit flies lay their eggs inside the skin of the fruit and larvae (maggots) feed inside the fruit. Check for rotten and fallen fruit
- Look for adult flies on the plants

Melon fruit fly

Fruit fly damage

Fruit fly damage

Management

- Start monitoring as soon as fruits begin to develop
- For early detection , use commercial pheromone traps with cuelure, methyl eugenol and trimedlure (3 traps/ 50m^2)
- Collect dropped fruits and bury them outside the fields at a depth of 60 cm with plastic bags if possible use it to feed animals such as pigs.
- Use food baits e.g. waste brewers' yeast at 45ml/L of water

(ii) *Red pumpkin beetles (Aulacophora foveicollis*)

Symptoms

- Examine the leaves, flowers and fruits for feeding damage by adults. They feed between leaf veins, often cutting and removing circles of leaf, and fly between plants
- Larvae tunnels into the roots causing them to become swollen, discoloured and distorted

Red pumpkin beetle

Red pumpkin beetle damage

Management

- Avoid planting new crops next to those which are already infested with beetles – the adults can easily fly between plants and fields - make sure nearby farmers manage these bettles on their farms
- If possible do not plant in a previously infested field. Otherwise wait at least 1-2 months after harvesting and destroying previous crop remains (bury or burn) before planting the new crop
- Cover seedlings with polythene bags to protect against beetle damage or mosquito nets to act as a barrier between plants and fields
- Encourage healthy plant growth by applying manures and/ or commercial fertilizers and providing adequate water. This is especially important for seedlings which are particularly vulnerable to beetle damage
- For small infestations, collect beetles using hand nets in the early hours of the morning when beetles are sluggish. Kill them using kerosene
- Spray wood ash onto the crop. Add half a cup of wood ash and half a cup of lime to 4 L water. Test the strength of the mixture on a few infested plants before spraying the whole crop

8.2 DISEASE MANAGEMENT

Observe the following;

- Practice Crop rotation
- Use healthy seeds of resistant varieties
- Avoid planting at high density

(i) Cucumber Mosaic Virus

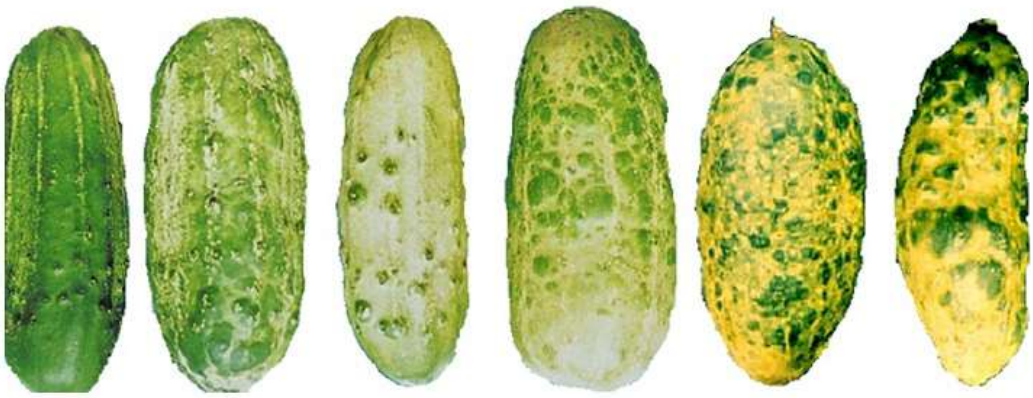
Symptoms

- Cucumber mosaic virus is transmitted by over 80 species of aphids (the most common are *Myzus persicae* and *Aphis gossypii*) therefore the prevention and management of aphids is important
- Stunting of plants
- Mosaic pattern on growing points similar to yellow streaking and spotting, ring-spots or line patterns on leaves of affected plants.
- Older leaves develop chlorotic and then necrotic areas along leaf margins which later spread over the entire leaf
- Ring-spots or line patterns on fruit fruits, pale green or white areas intermingled with dark green, bumpy areas. It may be miss hapen but with a smooth-grey-white colour and

irregular green areas

- Flower colour becomes pale and not many produced
- Infected plants do not produce enough runners.

Cucumber mosaic virus on leaves
Leaves showing signs of infection with the cucumber mosaic virus



Cucumber mosaic virus on fruit
Fruits showing signs of infection with the cucumber mosaic virus

Management

- Check the plant plants for aphids about 7 days after planting
- Keep a close check on plants after they are about 6 weeks old, look for virus symptoms which typically start to appear from this stage onwards
- Check for ants as this may be a sign that aphids are present. Ants eat the honey dew produced by aphids and in return protect the aphids
- Do not take cuttings from an infected plant, even if it does not show symptoms since it is

likely to be infected

- When possible do not plant in previously infected areas and areas which have high populations of aphids
- Sanitize tools and machinery. The virus is mostly aphid transmitted but can be transmitted between plant through tools such as prunning knives
- Spray plants with neem oil extract are usually recommended as 1 to 2% oil solution in water
- Remove diseased plants from the field by placing them in a bag and dispose off by buring or burning.
- Spray crop with Imidacloprid based products.

(ii) Downey mildew

Symptoms

- Downey mildew is a fungi-like organism that is transported by the wind, splashing water or by mechanical means to another suitable host with repeated cycles.
- Inspect crop weekly for symptoms
- Disease starts from lower mature leaves and spreads progressively to younger leaves
- Small pale green areas appear on upper side of the lower leaves and soon change to yellow angular spots bounded by leaf veins
- Lesions on leaves may appear water-soaked after long periods of leaf wetness. As lesions age, they usually become necrotic and result in defoliation and a reduction in yield. During moist weather, the underside of the infected leaves may become covered with a purplish- grey downy fungal growth

Downey mildew on cucumber fruit

Downey mildew on cucumber leaves

Management

- Planting on slope parts of the field increases the incidence of the disease. This is because the disease spreads by the wind.
- Do not plant downwards of an infected field since the fungus spreads via wind
- Plant in field with good drainage
- Select sites with good air movement and minimal shading
- Keep plants healthy and more resistant to infection by applying optimal levels of fertilizer and irrigation
- Remove volunteer and wild cucurbit plants in and around fields to reduce nutrient competition, planting density and the amount of planting material that Downey can live on
- Downey mildew does not survive on dead plants/crop debris so there is no need to burn or plough into crop remains

9.0 HARVESTING

Fruits mature **50 – 60 days after planting** depending on the variety. Cucumbers must be completely green at harvest. Fruits may be picked when the skin still has ridges and prickles on them. Smooth skinned seeded fruit signifies over maturity. Picking must be done three times a week to promote female flower production and fruit set. The fruits ripen at different times on the vine. It is good to pick them when they are ready to avoid a bitter flavour that developes in cucumbers that are left on the vine for too long.

10.0 Yield

A potential yield of 45.0 – 50.0 mt /Ha can be obtained depending on the variety and with the best agricultural practices.

10.1 Packaging

Cucumbers must be handled carefully to avoid bruises and cuts. Transport in crates lined with straw and keep fruit in a fairly cool moist environment.

10.2 Storage

Cucumbers can store for between 10-14 days under cool temperature with high humid conditions.