

# Organic Plant Protection

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## Introduction:

The key to organic farming (without chemicals) is correct growing methods and prevention. All of organic farming is dependent on 3 basic practices:

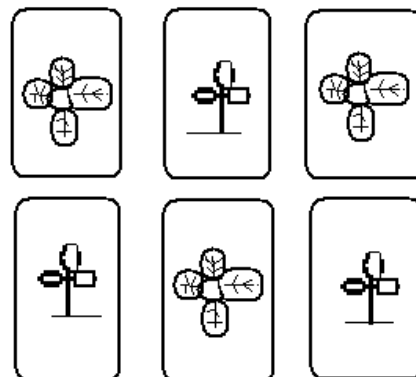
- **Proper crop rotation:** Crops of the same family should not follow each other (example: Tomato cannot follow eggplant).
- **Correct Fertilization/watering:** Plants that are not healthy are easily sick or attacked by insects. Over watering can cause root and stem fungi that can destroy the plant.
- **Crop watching and treatment:** Spot check (check a few plants in different places) for insects and disease every day and treat for the problem. Diseases and insects are easier to control when the problem is small. Be sure to check around wells or other places with standing water as they may be insect breeding sites.

## Pest Prevention through Mixed Cropping and Garden Sanitation:

In order to properly control pests and diseases, the first step is to try and stop them from entering the garden. Areas where water is constantly standing (near wells) can be sites for insect breeding- causing more insects to enter the garden. Also, nearby garden plots can be a source of insects/diseases if they are not managed properly by their owner. Plant pest repelling crops such as marigolds, mint or lemongrass around wells and garden plots to discourage insects from entering the area. Be careful not to over water your garden plots as this can often cause root, stem and leave diseases. If you can press water from the soil with your hand, it is too wet and you should reduce watering.

Different crops can also be planted together in order to prevent insects. Many Insects find their food (your crop) by sight or smell. Certain crops can be grown together to confuse certain insects. If you have had insect problems in the past, you may be able to prevent it by growing crops in different places throughout your garden. This will also stop the spread of disease if one plant becomes affected. For example- mixed cropping tomato with cabbage can help prevent diamondback moth. For more examples see table below.

Mixed Cropping with Cabbage and Tomato



## Physical Barriers for Control of Insects and Disease:

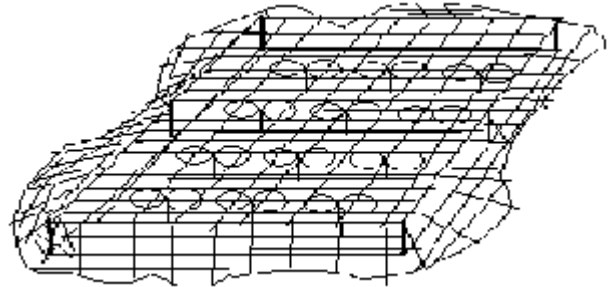
☒ An easy way to prevent insect damage is to stop them from reaching the plant.

- **Mosquito net**

Mandinka=            Wollof=

**Diseases controlled:** insect damage and virus transmission. Especially effective in the nursery.

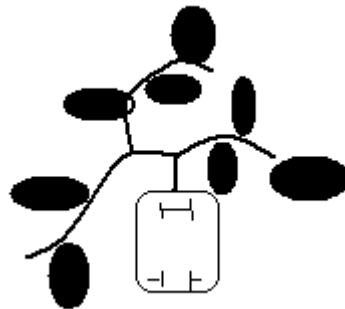
**How to make it:** Stake short wood sticks on the ground surrounding the nursery. You will probably need 4 sticks per m<sup>2</sup>. Place the mosquito net over top. Leave enough space for the plants to grow. **THE MOSQUITO NET SHOULD NOT TOUCH THE PLANT.** Otherwise the insects can reach the plant through the net.



### Paper Covers for Cucumbers:

**Diseases controlled:** Fruit Fly Damage

**How to make it:** Make a small bag out of paper (newspaper or a telephone book). Close it at both ends. \* Make sure there is enough room for the cucumber to grow. **CATION:** Cucumber covers may cause the fruit to ripen faster than usual. Make sure your cucumbers are shaded by the plants leaves.



### Natural Pest and Disease Sprays:

Once you have spotted an insect or disease in your garden, you should apply the proper organic treatment. Organic sprays often need to be sprayed regularly- one time may not be enough.

*REMEMBER: IT IS VERY IMPORTANT TO CHECK YOUR GARDEN EVERYDAY TO IDENTIFY INCECTS/DISEASE WHEN THEY ARE SMALL.*

### Plants for Pest Control:

☒ For most of the natural sprays, it is necessary to spray every 3 to 5 days until the problem has finished.

- **Annona species**

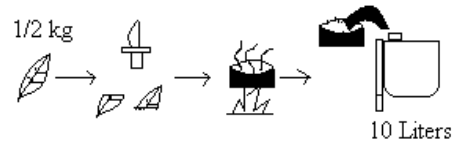
English: sweet and sour sop

Mandinka= tubabosukungo    Wollof= sweep SOP

**Part used:** Leaves

**Insects controlled:** Aphids, caterpillars, Diamond-Back moth, Flea Beetle, grasshoppers, armyworm.

**How to make it:** Chop ½ kilogram of leaves and put in 2 litres water, boil to 1 litre and mix with 10 litres water.



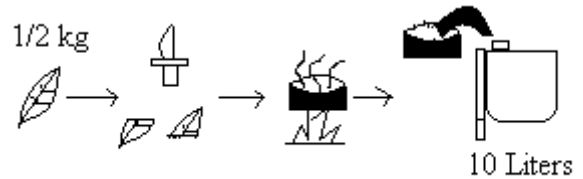
- **Basil**

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**Part used:** Leaves and stem

**Insects controlled:** Red spider mites, Leaf miners, fruit flies.

**How to make it:** Chop of 300 grams fresh basil and put in 2 litres water, boil to 1 litre and mix with 10 litres water.



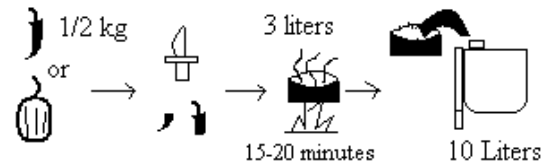
- **Chilli peppers**

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**Part used:** Fruit

**Insects controlled:** Ants, scales, caterpillars, aphids, diamond-back moth.

**How to make it:** Chop of 500 grams fresh chillies and put in 3 litres water, boil to for 15-20 minutes and mix with 10 litres water.



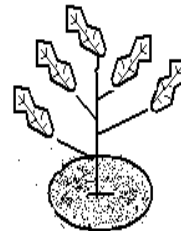
- **Chilli powder (dry)**

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**Part used:** Fruit

**Insects controlled:** Ants and termites.

**How to use it:** spread chilli powder around the base of the plant from near the stem to the furthest leaf.



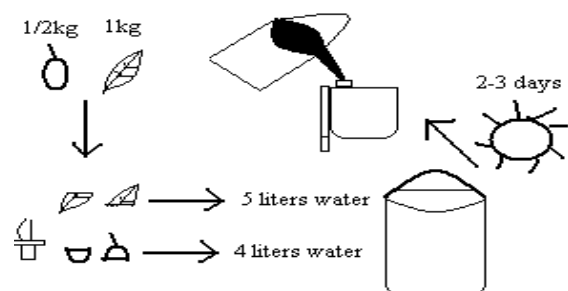
- **Neem**

**Part used:** seeds, leaves, skin (bark)

**Insects controlled:** Controls most insects

**How to make it:** Chop of 1kilogram fresh leaves and put in 5 litres water or pound 1/2 kg unripe fruit and put in 4 litres water, leave it for 2 days and spray every 4 to 5 days. OR ½ litre neem oil in 4 ½ litres water and **spray every 4 to 5 days.**

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- **Tobacco**

**Part used:** leaves

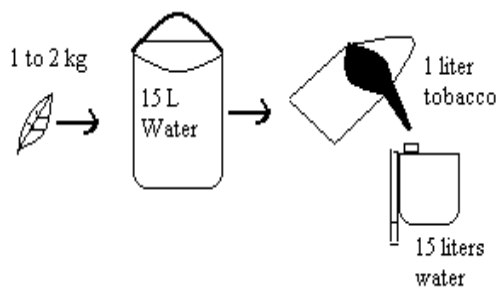
**Insects controlled:** Controls many insects

**Tobacco can carry a virus that easily affects plants of the solanaceous family- DO NOT USE IT ON OR NEAR: Tomatoes, potatoes, chillies, eggplant, Sweet pepper, Bitter tomato, ect. Can be used on cabbage, cucumber, squash, salad, ect.**

**How to make it:** Soak 1-2 kg in 5 litres water for one day. Filter with a cloth and put in 15 litres water.

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Wollof= brince



- **Garlic**

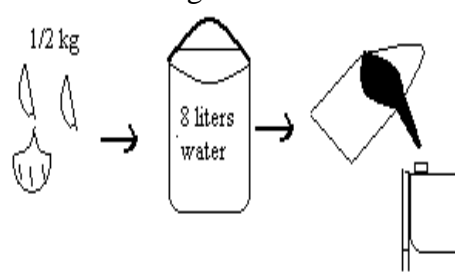
**Part used:** Seed

**Insects controlled:** aphids, leafhoppers, squash bugs, whiteflies

**How to make it:** Chop 500 grams garlic and add it to 8 litres water. Let sit for 2 to 3 days.

Mandinka= ladgo

Wollof= ladge



### Non-plant Materials for Pest Control:

- **Biobit**

**Insects controlled:** many types of worms.

**How to make it:** Put 1 packet in 10 litres of water. Spray on 100 m<sup>2</sup>. Use every 10 days to 2 weeks.

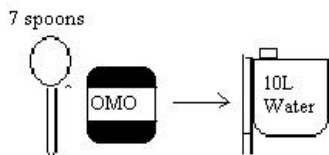
- **Soap**

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**Insects controlled:** soft body insects: aphids, green hoppers. Also works on thrips and mites.

**Do not use it on thin leaved plants in the nursery.**

**How to make it:** Put seven spoons of OMO in 10 litres water or ¼ bar of laundry soap in 10 litres water.



- **Wood Ash**

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**Insects controlled:** soft body insects: aphids, white flies. Also works on Red Spider Mite, and leaf beetles grasshoppers.

**How to make it:** Mix wood ash in later until it is cloudy (not clear). Leave for 1 or two hours to let solids settle. Spray. Also straight wood ash can be put on/around plants to prevent insects.

## **Insect Identification:**

### **Aphids:**

Small soft bodied black/green insects that suck the sap from leaves. Eggs placed on undersides of leaves by ants where they develop into adults. Can cause leaf and flower damage (and therefore damage fruit).

#### **Control:**

To stop aphids, it is necessary to stop ants. Put ash and or chilli powder dusts around the plants base to stop the ants from climbing the plant. If aphids are already present, Spray with soap, chilli peppers, ash or a combination of the three.



### **Diamond Back Moth:**

Mostly affect plants of the brassica family. Moths with light diamond pattern visible on the back- Only flies at night. Larvae (worms) are small and pale green with light brown heads. Young larvae make tunnels in leaves; older larvae make irregular shaped holes in the leaves and heads of cabbage.

#### **Control:**

Cabbage and tomato intercrop. Spray with Biobit or tobacco if larvae are found in the plant.



### **Grasshoppers:**

Small or large brown/green insects with feathery wings and large hind legs. Eats leaves, usually starting at the edge.

#### **Control:**

Cover plants with wood ash and hand picking.

**Leaf hoppers:**

Very small green insects found on the undersides of leaves. Seem to 'hop' when disturbed. Suck plant sap and carry viruses such as Tobacco Mosaic Virus (TMV) and Tomato Yellow Leaf Curl Virus (TYLCV).

**Control:**

Neem solution, soap, chilli solution or a combination.

**Red Spider Mites (RSM):**

Very small red eight legged insects found under leaves. If heavy infestation, webs can be found on the leaves. Red Spider Mites suck the sap from leaves and fruit and can cause complete plant/fruit destruction. Damage comes appears first as a silver color on the leaves, with the leaves eventually dropping.

**Control:**

Water the whole area- the plant, foot paths, edges of the beds, ect- to stop RSM from spreading to other plants. Spray with neem and soap at the first sight of RSM and continue to spray every 5-7 days.

**White Fly:**

Very small flies that suck the sap from plants and carry viruses such as Tobacco Mosaic Virus (TMV) and Tomato Yellow Leaf Curl Virus (TYLCV). Very Damaging to nurseries.

**Control:**

Spray weekly with soap, woodash, garlic or a combination. Cover nurseries with a mosquito net.

**Tomato Fruit Worm:**

Adults are tan moths. Larvae: are light yellow, green, pink, or brown with white and dark stripes along the sides. Heads are yellow and legs are black. Larvae(worms) dig into tomato fruit and cause holes.

**Control:**

Spray with BT or neem and soap solution.



**Fruit Flies:**

Small flies with yellow or white markings on their bodies. Larvae: small white worms feeding on fruit.

**Control:**

Cover fruit with paper. Remove infected fruit and burn it.

**Leaf Beetle:**

Small round flying insect of orange or black colour. Eats round holes in the leaves of okra, cucumber beans and others.

**Control:**

Neem solution, wood ash or a combination

**Blister Beetle:**

Long Black or brown insects with narrow necks and long legs. Eats flowers and large holes in leaves. Mostly affect Okra.

**Control:**

Neem and soap solution, Hand picking.



