

Description

Hot pepper is a member of the solanaceae family which includes potatoes, tomatoes and eggplants etc. the crop is mostly favored in tropical and subtropical regions since it needs enough sunlight and heat for its productivity. Fruits are consumed fresh, dry or in processed forms as vegetable or spices. Hotpepper is rich in vitamin A, C and B6, K, Mg and Fe

Varieties

The common varieties include;

- Hot Red Pepper
- Orange & Yellow Hot Pepper
- Ugandan Red Bird Eye Chilli
- Scotch Bonnet
- Thai Hot Pepper
- Habanero

Ecological Requirements

Soil, the soil should be deep and well drained as too wet or waterlogged is likely to cause leaf drop.

Temperature, Peppers thrive when temperatures are warm . being sensitive to the cold, planting should be delayed until temperatures are 70 - 80 degrees Fahrenheit during day and 60-70 degrees Fahrenheit at night

Rainfall; 600-1200mm annually

Altitude; 0-1200 meters above sea level

PH; Range of 5.5 to 6.5

Visual



Credit: pexels-pixabay-265216

NOTE

The crop needs a good nutrient supply which can be helped by the addition of organic materials such as manure, compost and decomposed mulches.

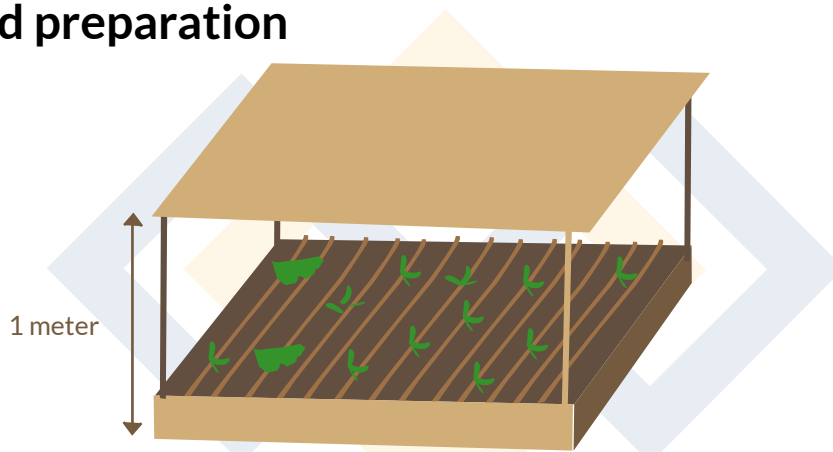
Too much nitrogen is not recommended as it makes the crop grow fast making it susceptible to diseases and less productivity.

Crop Cycle

Land Preparation

- Well drained soil. At early stages, the seedlings are mostly affected by damping off. Optimal water retained in the soil is required to avoid fungal reproduction and affection
- Therefore prefer loam or sandy soil as you avoid claylike soils for setting nursery bed
- Pests and disease free land. The nursery should be sited on the plot that has not been planted with any member of the solanaceae family for at least 3 years. For example tomatoes, eggplants, potatoes, green pepper, chili, sweet pepper or any other horticultural crop
- Avoid the garden near cereal crops like maize, sorghum as they have common pests like thrips; this ensures that there's no transfer of any pests or diseases to the young seedlings.

Nursery bed preparation



Nursery bed lay out (Source: east-west seeds crop guide)

- **Step1.** Clear the vegetation and weeds, then did the soils so that there's no lumps and soil is friable. This ensure uniform and easy seed germination.
- **Step2.** A week before planting, add 7cm of compost or well decomposed manure. use one wheelbarrow full of compost for every 3 square meters. Mix into the soil and water the bed
- **Step3.** Raise bed 15 cm to 20cm high above the ground and width of 1m wide and length of 3-5m then level it well, slightly slanting on one side to ensure that excess water flows out of the land.
- **Step4.** Float the seeds to remove all the dead and non viable seeds by picking all the floating seeds. Soak them in for at least 6-12 hrs to break seed dormancy.
- **Step5.** Small drills 3cm deep and 20cm apart are made by use of hand. seeds are mixed with soil and thinly spread along the drills. Cover the seeds slightly with soil. Water it and then cover it with dry grass.
- **Step7.** Seedlings will have germinated in 10-14 days. Remove the grass and raise the shade 1 meter above the ground

NOTE

The nursery should be watered twice a day. In the morning and evening, ensure that the soil is dry and not too wet but moist

The bed should be set across the direction of the sun. This ensures that the seedling gets the morning sunlight (between 8am-11am) and evening sunlight (between 4pm-6pm)

The shade should be 1M high and should be thinly covered to allow penetration of low rate sunshine.

Seedlings should be sprayed with fungicide to minimize fungal infection. Very low concentration of pesticide should be applied

Vegetative development.

- The pepper plant grows with a single stem, until 9 to 11 leaves have been formed. The main stem germinates with a flower. Two or three branches grow from the axils of the highest leaves

Flowering stage

- Under normal conditions the plant starts flowering at about forty days from planting out. The plants should be given another fertilizer application at about this stage. The aim is to assist the plant flowers and fruits. Therefore the fertilizer applied should have higher portions of potassium to Nitrogen

Pollination

- Pollen may be dropped straight from the anthers to the stigma. When insects visit the flower, pollen from one flower may be transported to another resulting in cross pollination

Fruiting

- Following fertilization, the flower petals will fall off and the ovary will begin to mature into a single pepper fruit. The ovary develops into a fleshy pericarp that wraps two or more locular chambers at this stage. The pericarp then thickens and expands to become pepper as we know.

NB: The locular cavities are the hollow areas inside the pepper where the seed develop

Maturity/Ripening

- Hot peppers will stay green for a while, but when they start to ripen, they will change to yellow, orange and finally red. It is at this point that they are ready to pick.

Harvesting

- When harvesting hot pepper, use gloves or wash your hands immediately after picking the fruit. Do not touch your eyes or mouth after harvesting.

Post harvest handling and storage

- Capsicums should never be immersed in water, but cleaned with brushes and water. Sanitisers can help to reduce microbial load and, therefore, storage rots. Capsicums should ideally be cooled below 8 degrees Celsius within 24 hours of harvest. Forced air and well circulated room cooling systems are suitable.

References

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Bacterial diseases

BACTERIAL SPOT

The disease is common at the late stages of plant growth. It is favored by the warm wet conditions

Symptoms

- Water soaked lesions that turn brown on the underside of the leaf and dries out
- Cracked brown lesions on the fruit

Visuals

How the infested crop looks like



How the healthy crop should look like



Management/Recommended practices

- Do not plant pepper in the same garden where the plants of the same family has been planted in previous season like potatoes, tomatoes.
- Use disease free seeds
- Destroy all the plant debris of the previous season

Fungal diseases

DAMPING OFF

This disease mostly affect the young seedling between one day to 2 weeks in the nursery bed
It is favored by excessive water in the soil, excessive nitrogen and overcrowding

Symptoms

- Some seeds may not germinate
- Water soaked lesions on the stem
- Seedlings collapsing and drying, dark stem just above the soil that shrives

Visuals

How the infested crop looks like



How the healthy crop should look like



Management/Recommended practices

- Proper plant spacing
- Plant disease free seeds
- Timely planting
- Avoid using overhead irrigation
- Using the recommended dose of fertilizer
- Ensure proper drainage
- Destroy crop debris which reduce pathogen innocuous

POWDERY MILDEW

The disease is caused by fungi. It occurs in both humid and dry conditions and it mostly affects the older leaves of the plant

Symptoms

- White powdery growth on the underside of the leaf that patches and the spreads all over the leaf

Visuals

How the infested crop looks like



How the healthy crop should look like



Management/Recommended practices

- Prune off the old branches and leaves
- Spray with fungicide when necessary

NOTE

The disease may not have high economic loss on the farmer if the infestation is low.

PHYTOPHTHORA BLIGHT

It's a fungal disease is highly water dependent
The spores spread water splash above the soil and under the soil from root to root.

Symptoms

- Black lesions on the stems
- Wilting and dying of plants.
- Dark lesions on the fruits.

Visuals

How the infested crop looks like



How the healthy crop should look like



POTATO MOSAIC VIRUS

This is a viral disease which affects a range of plants, it is transmitted by aphids
Weeds can also act as a source of inoculum

Symptoms

- Alternating light and green areas on the leaves surfaces
- Distortion and curling of the leaves.
- Stunted growth of the plants

APHIDS

- These are 2-4mm long insects and are found underneath the leaves.
- They are very common in dry conditions and weedy or bushy garden
- Aphids mine plant sap and reduce photosynthetic area of the plant thus resulting in stunted growth, mosaic appearance of leaves and mottling.

Visuals

How the infested crop looks like



How the healthy crop should look like



Management/Recommended practices

- Timely weeding
- Spraying plants from beneath with water under high pressure to kill aphids
- Scouting at least twice a week to detect the problem early
- Use of pesticides that include Dudenectin, Cyperthrin, Confidor (systemic).

FLOWER THRIPS (FRANKLINIELLA OCCIDENTALIS)

- This is a pest of significance in hot pepper.
- Thrips are responsible for transmitting various viruses
- They cause damage to plants by piercing the cells of the surface tissues and sucking their contents causing the surrounding tissue to die. The resulting silver grey patches on leaves and the black spots of their excreta indicate their presence in the crop. The vigor of the crop is reduced by loss of chlorophyll. When infestations become serious the leaves themselves shrivel.

FRUIT FLY

- In Uganda there are four sub-species i.e Bactrocera spp, Dacus spp, Ceratitis spp and the melon fly.
- The larva is the most destructive stage
- The female pierce the fruits and lay between 3-30 eggs where the larva hatch from.
- The larvae cause destruction by feeding on the pulp of the fruit and emit the bacteria that cause rotting of fruits.
- Larvae remain in the fruits until fully grown(2 to 3 weeks) and at this time;the larvae exit the pepper and drop to the soil to pupate when the soil moisture and temperature are favorable.

Visuals

How the infested crop looks like



How the healthy crop should look like



Management/Recommended practices

- Use of fruit fly traps(8 traps per acre)
- Timely weeding.
- Routine scouting for early detection of damage.
- Avoid intercropping hot pepper with tall growing crops such as maize, cassava.etc
- Field hygiene, remove all ripe and fallen fruits in the garden and bury them.
- Keep an eye on nearby host plants.
- Apply pesticides such as Nimbecide, Imidacloprid, Dufuacelamectin, Ocelamectin.

FALSE CODLING MOTH

The larvae bore into the fruits causing premature ripening and falling of fruits. The pest can breed all year round (with 5-10 generations a year) under favorable conditions. The female can lay up to 800 eggs in its lifespan.

Visuals

How the infested crop looks like



How the healthy crop should look like



NOTE

A mature larva exits the fruit by eating through the skin for pupation leaving an opening and this may promote secondary infestation by fungus and scavengers hence further damaging the fruit.

Management/Recommended practices

- Use of FCM pheromone traps(8 per acre)
- Timely weeding.
- Routine scouting for early detection of damage.
- Avoid intercropping hot pepper with tall growing crops such as maize.
- Field hygiene, remove all ripe and fallen fruits in the garden and bury them.
- Keep an eye on nearby host plants.
- Planting repellent crops at the boundary such as rosemary and Tobacco
- Keep the boundary clean up to 2m from the main garden.
- Don't harvest for more than one year from the same field.
- Conducting harvest inspection to detect the pest in the early stages.

Deficiencies

NITROGEN DEFICIENCY

Nitrogen deficiency in pepper plants causes chlorosis(yellow leaves) chlorosis is often an early warning sign followed by stunted growth of the plant due to lack of energy

Visuals

How the infested crop looks like



How the healthy crop should look like



Management/Recommended practices

- Compost. Good compost has a balanced mix of nutrients, including nitrogen and humus which promotes the growth of organisms like bacteria, earthworms in the garden, and also helps sandy soils to retain water and improves drainage in clay soils.
- Manure(animal bedding and waste) have a good amount of nitrogen, but the amount will vary depending on the animal it came from.

CALCIUM DEFICIENCY

- Too little calcium can cause major health problems when it comes to the fruit that plants produce.
- Calcium plays a big role in pepper plants' cell development. Pepper plants need calcium for the fruits to develop strong, thick walls.
- Without calcium the tissues won't be strong and will collapse and leak fluids before eventually dying
- Calcium deficiency causes a condition called blossom end rot, this condition affects immature peppers especially the plants earliest fruits and causes them to develop a pale green or yellow sunken area on the bottom of the fruit.

Visuals

How the infested crop looks like



How the healthy crop should look like



Management/Recommended practices

- Supply pepper plant with calcium nitrate via drip irrigation which will get to the roots efficiently
- Start adding calcium when the plant is blossoming and continue until the fruit has set
- Foliar sprays are sometimes recommended as a solution to calcium deficiency (these do not work well since calcium is transpired within the plant, there's no pathway for it to move from the leaves to the fruit).
- Calcium deficiency caused by insufficient watering is fixed by providing the crop with water they need. Keep the soil moist without over watering. Mulch is also an effective tool to prevent soil from drying out. Adding a layer of mulch will also keep your pepper plants at the

NOTE

Carefully control how much nitrogen you provide to your pepper plants. While nitrogen will enable the plant to develop its foliage, too much can predispose the plant to calcium deficiency

IRON, ZINC AND BORON DEFICIENCY

- A zinc deficiency causes yellow discoloration between veins, and low boron uptake results in distortion, brittle leaves, weak plant and brittle crop.
- An iron deficiency will cause the young leaves at the top of the plant to turn yellow.

Visuals

How the infested crop looks like



How the healthy crop should look like



POTASSIUM DEFICIENCY

- The K deficient pepper shows a severely reduced growth in height and leaf size.
- Leaves are bent down, look flaccid and wilted, while their color remains dark green.
- K deficient leaf blades show marginal and interveinal chlorosis with subsequent necrotic patches on older leaves

Visuals

How the infested crop looks like



How the healthy crop should look like



NOTE

To correct K deficiency, spread organic mulch beneath plants and apply potassium fertilizer. Potassium sulphate may be used and potassium will be held by organic matter and clay particles

phosphorus and potassium can be applied before planting pepper plants along with some nitrogen and Epsom salt.

Hold off on fertilizing for a couple of weeks after transplanting seedlings but apply most of nitrogen before the first fruit set

MAGNESIUM DEFICIENCY

- The Mg deficient plants in many cases show no obvious symptoms, except reduced yields.
- Yellowing of older leaves especially in the areas between the veins (leaf margins and veins stay green) giving the leaves a mottled effect

Visuals

How the infested crop looks like



How the healthy crop should look like



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PHOSPHORUS DEFICIENCY

- Pepper plants with slow, stunted or irregular growth are often displaying symptoms of nutrient deficiencies. Low nitrogen levels cause slow plant growth with little to no fruit development .
- Phosphorous deficiencies result in pants with small, hard, extreme dark green leaves that break off easily when handled
- Phosphorus and potassium can be applied before planting pepper plants along with some nitrogen and Epsom salt.
- Heavy applications of organic materials such as manure, plant residues or green manure crops to soils with high PH values. These do not only supply phosphorus, but on decomposition, provide acidic compounds which increase the availability of monera forms of phosphorus in the soil

Visuals

How the infested crop looks like



How the healthy crop should look like



Land Preparation

Item	Size/ Quantity Sold	Quantity per Acre	Frequency
Force up	1litre	2	1

Planting Stage

Item	Size/ Quantity Sold	Quantity per Acre	Frequency
Hot pepper Scotch bonet	150g	1	1
Easy grow starter	1Kg	1	1
Indofil	250g	4	1

Transplanting Stage(If Applicable)

Item	Size/ Quantity Sold	Quantity per Acre	Frequency
DAP	250g	4	1
Easy grow starter	1kg	1	1

Vegetative Stage

Item	Size/ Quantity Sold	Quantity per Acre	Frequency
Pesticide- Bravo (Imidacloprid)	1Ltr	1	6
Fungicide (T-BUZZ)	1Ltr	1	6

Flowering Stage

Item	Size/ Quantity Sold	Quantity per Acre	Frequency
Foliar fertilizer wuxal	1000ml	1	3
Nimbecidine	250ml	1	2

Maturity/Fruiting Stage(If Applicable)

Item	Size/ Quantity Sold	Quantity per Acre	Frequency
Mancozeb	3kg	3	7
Nimbecidine	3500ml	(3=1000m) (1=500)	14

Post Harvest Stage

Item	Size/ Quantity Sold	Quantity per Acre	Frequency
Tarpaulin	1 (6m*6m)	1	1