WATERMELON:

Basic Information

1. Name: Watermelon (*Citrullus lanatus*)
    - Watermelon is a popular summer fruit known for its high water content and refreshing taste. It belongs to the Cucurbitaceae family.
2. Best Season:
    - Watermelon is best suited for warm, dry climates. The planting season varies based on regional climatic conditions:
        - Spring Season: January to March (ideal in most parts of India, including Maharashtra).
        - Summer Season: November to February (in areas with mild winters).
    - Watermelons grow best when temperatures are between 22°C and 35°C.
3. Best Soil Type:
    - Watermelon requires:
        - Well-drained, sandy loam soils rich in organic matter.
        - A soil pH between 6.0 and 7.5 is ideal.
        - Fields with good drainage ensure better root development and prevent waterlogging.
    - Adding compost or farmyard manure improves soil fertility.
4. Time Period:
    - Watermelons take approximately 75–120 days from sowing to harvesting, depending on the variety.
    - Early maturing varieties may take around 70–80 days, while late-maturing ones need 100+ days.
5. Estimated Cost per Acre:
    - The approximate cost of watermelon cultivation per acre is ₹50,000–₹80,000.
        - This includes the cost of seeds, fertilizers, irrigation, labor, and pest management.
        - The cost varies depending on factors like variety, irrigation methods, and pest control measures.
6. Main Varieties:
    - There are several watermelon varieties grown for their taste, size, and adaptability:
        - Sugar Baby: Known for its small size, deep red flesh, and sweetness.
        - Arka Manik: Popular for its high yield, disease resistance, and bright red pulp.
        - Crimson Sweet: A widely cultivated variety with large fruits and excellent sweetness.

- Black Diamond: Valued for its thick rind, which makes it suitable for transport.
- Kiran: A hybrid variety known for its uniform size and attractive red flesh.
- Seedless Watermelon: Preferred for its convenience and growing popularity in the market.

Watermelons are an excellent cash crop for farmers due to their growing demand, especially in summer.

I.Anthracnose (*Colletotrichum orbiculare*):

- Symptoms: Circular, sunken lesions on leaves, stems, and fruits. Fruits may develop cracks and rot.
- Cause: Thrives in warm, humid conditions; spreads through water and infected plant debris.

1) Information

Anthracnose is a fungal disease caused by *Colletotrichum orbiculare*. It primarily affects watermelon leaves, stems, and fruits, leading to significant yield losses and reduced fruit quality. The disease thrives in warm, humid conditions and spreads rapidly through water splash, wind, and infected plant debris.

2) Disease: Anthracnose

a) Symptoms:

- **Leaves**: Circular, jagged, or irregular lesions appear on leaves, often starting as small, water-soaked spots. These lesions enlarge, turn brown, and may cause the leaf tissue to dry out and fall, giving a "shot-hole" appearance.
- **Stems**: Light brown, spindle-shaped lesions develop on stems, often with water-soaked margins.
- **Fruits**: Sunken, round lesions form on the fruit surface, often with a salmon-colored spore mass in the center. These lesions can expand, causing fruit rot and cracking.

b) Cure - Fertilizers:

- **Balanced Nutrition**: Apply fertilizers rich in potassium and phosphorus to strengthen plant resistance.
- **Fungicides**: Use fungicides like chlorothalonil, mancozeb, or azoxystrobin at regular intervals during the growing season. Ensure proper application as per manufacturer guidelines.

c) Prevention:

- Use disease-resistant watermelon varieties whenever possible.
- Practice crop rotation with non-cucurbit crops to reduce fungal spore buildup in the soil.
- Remove and destroy infected plant debris after harvest to minimize fungal reservoirs.
- Avoid overhead irrigation to reduce water splash, which spreads fungal spores.
- Ensure proper plant spacing to improve airflow and reduce humidity around the plants.

d) Causes:

- Caused by the fungus *Colletotrichum orbiculare*.
- Thrives in warm, humid conditions with frequent rainfall.
- Spread occurs through water splash, wind, contaminated tools, and infected plant debris.

3) Pest/Insect

a) Symptoms: Anthracnose is not directly caused by pests, but pests like aphids and cucumber beetles can weaken the plant, making it more susceptible to fungal infections. Symptoms of pest activity include:

- Sticky honeydew secretions on leaves (from aphids).
- Feeding damage on leaves and stems (from beetles).

b) Cure - Fertilizer:

- Use neem-based organic fertilizers to deter pests naturally.
- Apply systemic insecticides like imidacloprid or carbaryl to control pest populations.
- Promote biological control agents such as ladybugs and lacewings to reduce aphid infestations.

4) Nutrition Deficiency

a) Symptoms: Nutritional deficiencies can weaken watermelon plants, making them more prone to diseases like Anthracnose.

- **Nitrogen Deficiency**: Yellowing of older leaves, stunted growth, and reduced foliage.
- **Potassium Deficiency**: Browning or scorching of leaf edges and tips, weak stems, and poor fruit quality.
- **Calcium Deficiency**: Distorted young leaves, yellow or brown spots, and cracking of fruits.

b) Cure - Fertilizer and Compost:

- **Nitrogen Deficiency**: Apply nitrogen-rich fertilizers like urea or ammonium nitrate. Organic options include composted manure or fish emulsion.
- **Potassium Deficiency**: Use potassium sulfate or muriate of potash. Organic alternatives include wood ash or banana peels.
- **Calcium Deficiency**: Add lime, gypsum, or crushed eggshells to the soil. Enrich the soil with calcium-rich compost to improve overall nutrient availability.

II.Fusarium Wilt (*Fusarium oxysporum f. sp. niveum*):

- Symptoms: Yellowing and wilting of leaves, vascular discoloration, and eventual plant death.
- Cause: Soilborne fungus; survives in the soil for years.

1) Information

Fusarium Wilt is a soilborne fungal disease caused by *Fusarium oxysporum f. sp. niveum*. It primarily affects watermelon plants by attacking their vascular system, leading to wilting, stunted growth, and plant death. The fungus can persist in the soil for many years, making it a challenging disease to manage. It thrives in warm, sandy soils with low pH and can spread through infected seeds, soil, and water.

2) Disease: Fusarium Wilt

a) Symptoms:

- **Early Stage**: Leaves appear dull gray-green and wilt during the hottest part of the day but recover at night.
- **Progression**: Gradual yellowing of leaves, stunted growth, and wilting of individual runners.
- **Advanced Stage**: Permanent wilting, vascular discoloration (brown to reddish streaks) in stems, and plant death.
- **Root Symptoms**: Roots may initially appear healthy but later turn dark brown with soft rot near the crown.

b) Cure - Fertilizers:

- **Balanced Nutrition**: Apply fertilizers rich in potassium and phosphorus to strengthen plant resistance.
- **Fungicides**: Use fungicides like prothioconazole (Proline®) through drip irrigation to reduce disease severity.

c) Prevention:

- **Crop Rotation**: Rotate with non-cucurbit crops for 5–6 years to reduce fungal spore buildup in the soil.
- **Resistant Varieties**: Plant Fusarium-resistant watermelon varieties.
- **Soil Management**: Maintain soil pH above 6.5 and improve drainage to reduce fungal activity.
- **Sanitation**: Remove and destroy infected plant debris after harvest.
- **Seed Treatment**: Use certified disease-free seeds and treat seeds with fungicides before planting.

d) Causes:

- Caused by the fungus *Fusarium oxysporum f. sp. niveum*.
- Thrives in warm, sandy soils with low pH (5.5–6.5).
- Spread occurs through infected seeds, contaminated soil, water, and tools.

3) Pest/Insect

a) Symptoms: Fusarium Wilt is not directly caused by pests, but pests like nematodes can damage roots, making plants more susceptible to fungal infections. Symptoms of nematode activity include:

- Root galls or knots.
- Stunted growth and yellowing leaves.

b) Cure - Fertilizer:

- Use neem cake or neem oil-based fertilizers to deter nematodes.
- Apply biological controls like beneficial nematodes to reduce harmful nematode populations.
- Maintain soil health with organic amendments to suppress nematode activity.

4) Nutrition Deficiency

a) Symptoms: Nutritional deficiencies can weaken watermelon plants, making them more prone to Fusarium Wilt.

- **Nitrogen Deficiency**: Yellowing of older leaves, stunted growth, and reduced foliage.
- **Potassium Deficiency**: Browning or scorching of leaf edges and tips, weak stems, and poor fruit quality.
- **Calcium Deficiency**: Distorted young leaves, yellow or brown spots, and cracking of fruits.

b) Cure - Fertilizer and Compost:

- **Nitrogen Deficiency**: Apply nitrogen-rich fertilizers like urea or ammonium nitrate. Organic options include composted manure or fish emulsion.
- **Potassium Deficiency**: Use potassium sulfate or muriate of potash. Organic alternatives include wood ash or banana peels.
- **Calcium Deficiency**: Add lime, gypsum, or crushed eggshells to the soil. Enrich the soil with calcium-rich compost to improve overall nutrient availability.

III.Powdery Mildew (*Podosphaera xanthii*):

- Symptoms: White powdery spots on leaves and stems; leads to leaf distortion and reduced photosynthesis.
- Cause: Fungal spores spread by wind and high humidity.

1) Information

Powdery Mildew is a fungal disease caused by *Podosphaera xanthii*. It primarily affects watermelon leaves, stems, and sometimes fruits, leading to

reduced photosynthesis, stunted growth, and lower yields. The disease thrives in warm, dry climates with high humidity and spreads rapidly under favorable conditions.

2) Disease: Powdery Mildew

a) Symptoms:

- **Leaves**: White, powdery fungal growth appears on the upper and lower surfaces of leaves.
- **Stems**: Powdery patches may extend to stems, causing them to weaken.
- **Fruits**: In severe cases, the fungus may spread to fruits, causing discoloration and reduced quality.
- Affected leaves may curl, dry out, and fall prematurely, leading to reduced plant vigor.

b) Cure - Fertilizers:

- **Balanced Nutrition**: Apply fertilizers rich in potassium and phosphorus to strengthen plant resistance.
- **Fungicides**: Use sulfur-based fungicides or systemic fungicides like azoxystrobin or myclobutanil. Spray at the first sign of infection and repeat as needed.

c) Prevention:

- Plant resistant watermelon varieties to reduce susceptibility.
- Ensure proper plant spacing to improve airflow and reduce humidity around the plants.
- Avoid overhead irrigation to minimize water splash and spore dispersal.
- Remove and destroy infected plant debris to prevent the spread of fungal spores.

d) Causes:

- Caused by the fungus *Podosphaera xanthii*.
- Thrives in warm, dry conditions with high humidity.
- Spread occurs through wind, water splash, and contaminated tools.

3) Pest/Insect

a) Symptoms: Powdery Mildew is not directly caused by pests, but pests like aphids can weaken the plant and create favorable conditions for fungal infections. Symptoms of pest activity include:

- Sticky honeydew secretions on leaves and stems.
- Clusters of aphids feeding on plant sap.

b) Cure - Fertilizer:

- Use neem-based organic fertilizers to deter pests naturally.
- Apply systemic insecticides like imidacloprid to control aphid populations.
- Promote biological control agents such as ladybugs and lacewings to reduce pest infestations.

4) Nutrition Deficiency

a) Symptoms: Nutritional deficiencies can weaken watermelon plants, making them more prone to Powdery Mildew.

- **Nitrogen Deficiency**: Yellowing of older leaves, stunted growth, and reduced foliage.
- **Potassium Deficiency**: Browning or scorching of leaf edges and tips, weak stems, and poor fruit quality.
- **Calcium Deficiency**: Distorted young leaves, yellow or brown spots, and cracking of fruits.

b) Cure - Fertilizer and Compost:

- **Nitrogen Deficiency**: Apply nitrogen-rich fertilizers like urea or ammonium nitrate. Organic options include composted manure or fish emulsion.
- **Potassium Deficiency**: Use potassium sulfate or muriate of potash. Organic alternatives include wood ash or banana peels.
- **Calcium Deficiency**: Add lime, gypsum, or crushed eggshells to the soil. Enrich the soil with calcium-rich compost to improve overall nutrient availability.

IV.Downy Mildew (*Pseudoperonospora cubensis*):

    - Symptoms: Angular yellow spots on leaves, which later turn brown and necrotic.
    - Cause: Spread by water splash and humid conditions.

1) Information

Downy Mildew is a destructive foliar disease caused by the oomycete *Pseudoperonospora cubensis*. It primarily affects cucurbits, including watermelon, leading to reduced yields and poor fruit quality. The disease thrives in cool, moist conditions and spreads rapidly under favorable environmental conditions.

2) Disease: Downy Mildew

a) Symptoms:

- **Leaves**: Angular, yellow lesions appear on the upper surface of leaves, bound by veins. These lesions turn brown and necrotic over time.
- **Underside of Leaves**: Gray-brown to purplish-black fungal growth is visible during humid conditions.
- **Advanced Stage**: Leaves curl upwards, dry out, and die prematurely, exposing fruits to direct sunlight and increasing the risk of sunscald.

b) Cure - Fertilizers:

- **Balanced Nutrition**: Apply fertilizers rich in potassium and phosphorus to strengthen plant resistance.
- **Fungicides**: Use fungicides like chlorothalonil, mancozeb, or copper-based products. Spray at regular intervals during humid conditions to control the disease.

c) Prevention:

- Plant resistant watermelon varieties to reduce susceptibility.
- Ensure proper spacing between plants to improve airflow and reduce humidity.
- Avoid overhead irrigation to minimize water splash and spore dispersal.
- Remove and destroy infected plant debris to prevent the spread of fungal spores.

d) Causes:

- Caused by the oomycete *Pseudoperonospora cubensis*.

- Thrives in cool, moist conditions with high humidity.
- Spread occurs through wind, water splash, and contaminated tools.

3) Pest/Insect

a) Symptoms: Downy Mildew is not directly caused by pests, but pests like aphids can weaken the plant and create favorable conditions for fungal infections. Symptoms of pest activity include:

- Sticky honeydew secretions on leaves and stems.
- Clusters of aphids feeding on plant sap.

b) Cure - Fertilizer:

- Use neem-based organic fertilizers to deter pests naturally.
- Apply systemic insecticides like imidacloprid to control aphid populations.
- Promote biological control agents such as ladybugs and lacewings to reduce pest infestations.

4) Nutrition Deficiency

a) Symptoms: Nutritional deficiencies can weaken watermelon plants, making them more prone to Downy Mildew.

- **Nitrogen Deficiency**: Yellowing of older leaves, stunted growth, and reduced foliage.
- **Potassium Deficiency**: Browning or scorching of leaf edges and tips, weak stems, and poor fruit quality.
- **Calcium Deficiency**: Distorted young leaves, yellow or brown spots, and cracking of fruits.

b) Cure - Fertilizer and Compost:

- **Nitrogen Deficiency**: Apply nitrogen-rich fertilizers like urea or ammonium nitrate. Organic options include composted manure or fish emulsion.
- **Potassium Deficiency**: Use potassium sulfate or muriate of potash. Organic alternatives include wood ash or banana peels.
- **Calcium Deficiency**: Add lime, gypsum, or crushed eggshells to the soil. Enrich the soil with calcium-rich compost to improve overall nutrient availability.

V.Gummy Stem Blight (*Stagonosporopsis cucurbitacearum*):

- Symptoms: Water-soaked lesions on stems and leaves, producing a gummy exudate.
- Cause: Thrives in moist conditions and spreads through infected seeds and debris.

1) Information

Gummy Stem Blight is a fungal disease caused by *Stagonosporopsis cucurbitacearum* (formerly *Didymella bryoniae*). It affects cucurbits, including watermelon, leading to foliar blight, stem cankers, and fruit rot. The disease is seedborne and thrives in warm, humid conditions, causing significant yield losses.

2) Disease: Gummy Stem Blight

a) Symptoms:

- **Leaves**: Marginal brown discoloration starts on the leaves, spreading inward to the leaf lamina. Leaves turn dark brown, dry out, and die, reducing photosynthesis.
- **Stems**: Water-soaked lesions develop on stems, often exuding a gummy substance. Stem cankers may girdle the plant, leading to wilting.
- **Fruits**: Black, sunken lesions appear on fruits, often leading to rot.

b) Cure - Fertilizers:

- **Balanced Nutrition**: Apply fertilizers rich in potassium and phosphorus to strengthen plant resistance.
- **Fungicides**: Use fungicides like chlorothalonil, mancozeb, or azoxystrobin to control the disease. Apply sprays at regular intervals during humid conditions.

c) Prevention:

- Use disease-free seeds and treat seeds with fungicides before planting.
- Practice crop rotation with non-cucurbit crops to reduce fungal spore buildup in the soil.

- Remove and destroy infected plant debris after harvest to minimize fungal reservoirs.
- Ensure proper plant spacing to improve airflow and reduce humidity.
- Avoid overhead irrigation to minimize water splash and spore dispersal.

d) Causes:

- Caused by the fungus *Stagonosporopsis cucurbitacearum*.
- Thrives in warm, humid conditions with frequent rainfall.
- Spread occurs through infected seeds, contaminated tools, water splash, and wind.

3) Pest/Insect

a) Symptoms: Gummy Stem Blight is not directly caused by pests, but pests like aphids and cucumber beetles can weaken the plant, making it more susceptible to fungal infections. Symptoms of pest activity include:

- Sticky honeydew secretions on leaves (from aphids).
- Feeding damage on leaves and stems (from beetles).

b) Cure - Fertilizer:

- Use neem-based organic fertilizers to deter pests naturally.
- Apply systemic insecticides like imidacloprid or carbaryl to control pest populations.
- Promote biological control agents such as ladybugs and lacewings to reduce aphid infestations.

4) Nutrition Deficiency

a) Symptoms: Nutritional deficiencies can weaken watermelon plants, making them more prone to Gummy Stem Blight.

- **Nitrogen Deficiency**: Yellowing of older leaves, stunted growth, and reduced foliage.
- **Potassium Deficiency**: Browning or scorching of leaf edges and tips, weak stems, and poor fruit quality.
- **Calcium Deficiency**: Distorted young leaves, yellow or brown spots, and cracking of fruits.

b) Cure - Fertilizer and Compost:

- **Nitrogen Deficiency**: Apply nitrogen-rich fertilizers like urea or ammonium nitrate. Organic options include composted manure or fish emulsion.
- **Potassium Deficiency**: Use potassium sulfate or muriate of potash. Organic alternatives include wood ash or banana peels.
- **Calcium Deficiency**: Add lime, gypsum, or crushed eggshells to the soil. Enrich the soil with calcium-rich compost to improve overall nutrient availability.

VI.Bacterial Wilt (*Erwinia tracheiphila*):

- Symptoms: Sudden wilting of vines and plant death.
- Cause: Transmitted by cucumber beetles and feeding insects.

1) Information

Bacterial Wilt is a vascular disease caused by the bacterium *Erwinia tracheiphila*. It primarily affects cucurbits, including watermelon, leading to sudden wilting and plant death. The disease is transmitted by cucumber beetles, which carry the bacteria in their digestive tracts. Once infected, the plant's water transport system is blocked, causing rapid wilting.

2) Disease: Bacterial Wilt

a) Symptoms:

- **Early Stage**: Leaves appear dull green and wilt during the day but recover at night.
- **Progression**: Wilting spreads down the vine, eventually affecting the entire plant.
- **Advanced Stage**: Leaves turn yellow and brown at the margins, completely wither, and die.
- **Diagnostic Test**: Milky, sticky sap can be observed when the stem is cut near the crown and pulled apart.

b) Cure - Fertilizers:

- There is no cure for infected plants, but maintaining plant health can reduce susceptibility.

- Apply balanced fertilizers rich in potassium and phosphorus to strengthen plant resistance.

c) Prevention:

- Control cucumber beetle populations using insecticides or traps.
- Use row covers to protect plants from beetles during early growth stages.
- Remove and destroy infected plants to prevent the spread of bacteria.
- Practice crop rotation with non-cucurbit crops to reduce beetle populations.

d) Causes:

- Caused by the bacterium *Erwinia tracheiphila*.
- Transmitted by striped and spotted cucumber beetles through feeding wounds.
- The bacteria overwinter in the gut of beetles and are spread through their feces or mouthparts.

3) Pest/Insect

a) Symptoms: Cucumber beetles are the primary vectors of Bacterial Wilt. Symptoms of their activity include:

- Feeding damage on leaves, stems, and flowers.
- Presence of beetles near infected plants.

b) Cure - Fertilizer:

- Use neem-based organic fertilizers to deter beetles naturally.
- Apply systemic insecticides like carbaryl or imidacloprid to control beetle populations.
- Promote biological control agents such as parasitic nematodes to reduce beetle larvae in the soil.

4) Nutrition Deficiency

a) Symptoms: Nutritional deficiencies can weaken watermelon plants, making them more prone to Bacterial Wilt.

- **Nitrogen Deficiency**: Yellowing of older leaves, stunted growth, and reduced foliage.

- **Potassium Deficiency**: Browning or scorching of leaf edges and tips, weak stems, and poor fruit quality.
- **Calcium Deficiency**: Distorted young leaves, yellow or brown spots, and cracking of fruits.

b) Cure - Fertilizer and Compost:

- **Nitrogen Deficiency**: Apply nitrogen-rich fertilizers like urea or ammonium nitrate. Organic options include composted manure or fish emulsion.
- **Potassium Deficiency**: Use potassium sulfate or muriate of potash. Organic alternatives include wood ash or banana peels.
- **Calcium Deficiency**: Add lime, gypsum, or crushed eggshells to the soil. Enrich the soil with calcium-rich compost to improve overall nutrient availability.

VII.Bacterial Fruit Blotch (*Acidovorax citrulli*):

- Symptoms: Water-soaked lesions on fruits, which expand and crack.
- Cause: High humidity and infected seeds contribute to spread

1) Information

Bacterial Fruit Blotch is a bacterial disease caused by *Acidovorax citrulli*. It primarily affects watermelon fruits, seedlings, and foliage, leading to significant economic losses. The disease is seedborne and thrives in warm, humid conditions. It spreads rapidly, especially during the fruiting stage, and can cause up to 90% yield losses in severe cases2.

2) Disease: Bacterial Fruit Blotch

a) Symptoms:

- **Seedlings**: Water-soaked lesions appear on cotyledons and stems, which later turn dark brown and necrotic. Severe infections cause seedling collapse and damping-off.
- **Leaves**: Dark brown lesions develop along veins, often inconspicuous but may lead to chlorosis and leaf death.

- **Fruits**: Irregularly shaped, water-soaked lesions appear on the fruit surface. These lesions enlarge, crack, and may ooze bacterial slime. Fruits become unmarketable due to rot and discoloration2.

b) Cure - Fertilizers:

- **Balanced Nutrition**: Apply fertilizers rich in potassium and phosphorus to strengthen plant resistance.
- **Bactericides**: Use copper-based bactericides or streptomycin sprays to manage bacterial infections. Apply sprays during early fruit development2.

c) Prevention:

- Use certified disease-free seeds to prevent seedborne transmission.
- Treat seeds with hot water or bactericides before planting.
- Avoid overhead irrigation to reduce water splash and bacterial spread.
- Remove and destroy infected plants and debris to minimize bacterial reservoirs.
- Ensure proper plant spacing to improve airflow and reduce humidity2.

d) Causes:

- Caused by the bacterium *Acidovorax citrulli*.
- Thrives in warm, humid conditions with frequent rainfall.
- Spread occurs through contaminated seeds, water splash, wind, and infected plant debris2.

3) Pest/Insect

a) Symptoms: Bacterial Fruit Blotch is not directly caused by pests, but pests like aphids can weaken plants, making them more susceptible to bacterial infections. Symptoms of pest activity include:

- Sticky honeydew secretions on leaves and stems.
- Feeding damage on leaves and stems2.

b) Cure - Fertilizer:

- Use neem-based organic fertilizers to deter pests naturally.
- Apply systemic insecticides like imidacloprid to control aphid populations.

- Promote biological control agents such as ladybugs and lacewings to reduce pest infestations2.

4) Nutrition Deficiency

a) Symptoms: Nutritional deficiencies can weaken watermelon plants, making them more prone to Bacterial Fruit Blotch.

- **Nitrogen Deficiency**: Yellowing of older leaves, stunted growth, and reduced foliage.
- **Potassium Deficiency**: Browning or scorching of leaf edges and tips, weak stems, and poor fruit quality.
- **Calcium Deficiency**: Distorted young leaves, yellow or brown spots, and cracking of fruits2.

b) Cure - Fertilizer and Compost:

- **Nitrogen Deficiency**: Apply nitrogen-rich fertilizers like urea or ammonium nitrate. Organic options include composted manure or fish emulsion.
- **Potassium Deficiency**: Use potassium sulfate or muriate of potash. Organic alternatives include wood ash or banana peels.
- **Calcium Deficiency**

IX.Watermelon Mosaic Virus (WMV):

- Symptoms: Mosaic or mottling patterns on leaves, stunted growth, and malformed fruits.

1) Information

Watermelon Mosaic Virus (WMV) is a plant pathogenic virus belonging to the *Potyvirus* genus in the family *Potyviridae*. It primarily affects cucurbits, including watermelon, causing mosaic patterns, leaf malformation, and fruit distortion. The virus is transmitted by aphids in a non-persistent manner and thrives in warm, temperate, and Mediterranean climates. WMV can lead to significant yield losses and poor fruit quality.

2) Disease: Watermelon Mosaic Virus (WMV)

a) Symptoms:

- **Leaves**: Mosaic or mottling patterns appear on leaves, often accompanied by leaf curling, distortion, and reduced size.
- **Fruits**: Fruits may develop discoloration, uneven shapes, and surface roughness. Severe infections can lead to stunted growth and unmarketable fruits.
- **Plants**: General stunting of the plant with reduced vigor and productivity.

b) Cure - Fertilizers:

- There is no direct cure for viral infections, but maintaining plant health can reduce the impact of the disease.
- Apply balanced fertilizers rich in potassium and phosphorus to strengthen plant resistance and improve overall vigor.

c) Prevention:

- Use virus-free seeds and resistant watermelon varieties to minimize susceptibility.
- Control aphid populations using insecticides or biological agents.
- Remove and destroy infected plants to prevent the spread of the virus.
- Avoid planting cucurbits near infected fields to reduce the risk of transmission.
- Practice crop rotation with non-cucurbit crops to break the virus cycle.

d) Causes:

- Caused by the *Watermelon Mosaic Virus (WMV)*.
- Transmitted by aphids in a non-persistent manner.
- Spread occurs through infected plant material, aphid feeding, and contaminated tools.

3) Pest/Insect

a) Symptoms: Aphids are the primary vectors of WMV. Symptoms of aphid activity include:

- Sticky honeydew secretions on leaves and stems.
- Clusters of aphids feeding on plant sap, leading to leaf curling and yellowing.

b) Cure - Fertilizer:

- Use neem-based organic fertilizers to deter aphids naturally.
- Apply systemic insecticides like imidacloprid or dimethoate to control aphid populations.
- Promote biological control agents such as ladybugs and lacewings to reduce aphid infestations.

4) Nutrition Deficiency

a) Symptoms: Nutritional deficiencies can weaken watermelon plants, making them more prone to WMV.

- **Nitrogen Deficiency**: Yellowing of older leaves, stunted growth, and reduced foliage.
- **Potassium Deficiency**: Browning or scorching of leaf edges and tips, weak stems, and poor fruit quality.
- **Calcium Deficiency**: Distorted young leaves, yellow or brown spots, and cracking of fruits.

b) Cure - Fertilizer and Compost:

- **Nitrogen Deficiency**: Apply nitrogen-rich fertilizers like urea or ammonium nitrate. Organic options include composted manure or fish emulsion.
- **Potassium Deficiency**: Use potassium sulfate or muriate of potash. Organic alternatives include wood ash or banana peels.
- **Calcium Deficiency**: Add lime, gypsum, or crushed eggshells to the soil. Enrich the soil with calcium-rich compost to improve overall nutrient availability.