1. CROP INFORMATION
1.1 Crop Name: Cotton (Gossypium spp.)
1.2 Brief Description:
Cotton is a soft, fluffy staple fiber that grows in a protective case around the seeds of cotton plants. It is one of the world's most important textile fibers and a significant cash crop. Cotton plants are cultivated in warm climates and play a crucial role in the agricultural economies of many countries.

1.3 Diseases:
1.3.1 Disease Name: Cotton Aphid
1.3.1.1 Causal Agent:
Insect - Aphis gossypii
1.3.1.2 Disease Description:
Cotton aphids are small, soft-bodied insects that feed on plant sap. They can cause significant damage to cotton crops by stunting growth, reducing yield, and transmitting viral diseases. Aphid infestations often occur during periods of mild temperatures and high humidity.
1.3.1.3 Symptoms:
- Curling and distortion of leaves
- Stunted plant growth
- Presence of honeydew and sooty mold on leaves
- Yellowing of leaves
1.3.1.4 Prevention Methods:
- Maintain field hygiene and remove weeds
- Use resistant cotton varieties
- Encourage natural predators like ladybugs and lacewings
- Implement crop rotation
1.3.1.5 Treatment/Cure:
- Home-based: Spray a mixture of neem oil and water on affected plants
- Chemical control: Imidacloprid (₹500-700 per liter) or Thiamethoxam (₹1,200-1,500 per kg)
- Integrated Pest Management (IPM) techniques

1.3.2 Disease Name: American Bollworm
1.3.2.1 Causal Agent:
Insect - Helicoverpa armigera
1.3.2.2 Disease Description:
The American bollworm is a serious pest of cotton that can cause significant economic losses. The larvae feed on cotton bolls, flowers, and leaves, leading to reduced yield and quality of cotton. Outbreaks often occur during warm and dry conditions.
1.3.2.3 Symptoms:
- Circular holes in leaves and bolls
- Presence of frass (insect excrement) on damaged parts
- Shedding of squares and young bolls

- Defoliation in severe cases
1.3.2.4 Prevention Methods:
- Plant trap crops like marigold or okra around cotton fields
- Use pheromone traps for monitoring and mass trapping
- Implement proper irrigation and fertilization practices
- Encourage natural enemies like parasitic wasps
1.3.2.5 Treatment/Cure:
- Home-based: Handpick and destroy larvae, use neem-based preparations
- Chemical control: Spinosad (₹1,800-2,200 per liter) or Emamectin benzoate (₹1,500-1,800 per kg)
- Biological control using Bacillus thuringiensis (Bt) formulations

1.3.3 Disease Name: Anthracnose
1.3.3.1 Causal Agent:
Fungus - Colletotrichum gossypii
1.3.3.2 Disease Description:
Anthracnose is a fungal disease that affects cotton plants at various growth stages. It can cause significant yield losses, especially in warm and humid conditions. The disease can infect seeds, seedlings, leaves, and bolls, leading to reduced plant vigor and cotton quality.
1.3.3.3 Symptoms:
- Small, dark, sunken lesions on leaves, stems, and bolls
- Reddish-brown to black spots on leaves
- Boll rot and premature boll opening
- Seedling damping-off
1.3.3.4 Prevention Methods:
- Use disease-free, certified seeds
- Practice crop rotation with non-host plants
- Ensure proper field drainage
- Maintain optimal plant spacing for good air circulation
1.3.3.5 Treatment/Cure:
- Home-based: Remove and destroy infected plant parts
- Chemical control: Carbendazim (₹400-600 per kg) or Mancozeb (₹300-400 per kg)
- Seed treatment with fungicides before planting

1.3.4 Disease Name: Boll Rot
1.3.4.1 Causal Agent:
Various fungi, including Diplodia gossypina and Fusarium spp.
1.3.4.2 Disease Description:
Boll rot is a complex disease caused by multiple fungal pathogens. It affects cotton bolls, leading to significant yield losses and reduced fiber quality. The disease is favored by high humidity, excessive rainfall, and poor air circulation within the crop canopy.
1.3.4.3 Symptoms:
- Discoloration of bolls, ranging from brown to black
- Soft, watery decay of boll contents

- Premature boll opening
- Presence of fungal growth on affected bolls
1.3.4.4 Prevention Methods:
- Maintain proper plant spacing and row orientation for good air circulation
- Avoid excessive nitrogen fertilization
- Control insect pests that can create entry points for fungi
- Use cultivars with tight boll structures
1.3.4.5 Treatment/Cure:
- Home-based: Improve field drainage and remove affected bolls
- Chemical control: Copper oxychloride (₹350-450 per kg) or Propiconazole (₹1,200-1,500 per liter)
- Foliar application of potassium to enhance plant resistance

1.3.5 Disease Name: Cotton Mealy Bug
1.3.5.1 Causal Agent:
Insect - Phenacoccus solenopsis
1.3.5.2 Disease Description:
Cotton mealy bugs are soft-bodied insects that feed on plant sap, causing significant damage to cotton crops. They secrete honeydew, which promotes the growth of sooty mold on leaves. Severe infestations can lead to reduced plant vigor, yield loss, and poor fiber quality.
1.3.5.3 Symptoms:
- White, waxy coating on leaves and stems
- Presence of honeydew and sooty mold
- Stunted plant growth
- Leaf yellowing and premature leaf drop
1.3.5.4 Prevention Methods:
- Maintain field sanitation and remove alternative host plants
- Use sticky traps for monitoring
- Encourage natural predators like ladybirds and lacewings
- Avoid excessive use of nitrogen fertilizers
1.3.5.5 Treatment/Cure:
- Home-based: Spray a mixture of dish soap and water on affected plants
- Chemical control: Profenofos (₹600-800 per liter) or Buprofezin (₹1,000-1,200 per kg)
- Release natural enemies like Cryptolaemus montrouzieri beetles

1.3.6 Disease Name: Cotton Whitefly
1.3.6.1 Causal Agent:
Insect - Bemisia tabaci
1.3.6.2 Disease Description:
Cotton whiteflies are small, sap-sucking insects that can cause significant damage to cotton crops. They excrete honeydew, which promotes the growth of sooty mold on leaves. Whiteflies can also transmit viral diseases, further impacting crop health and yield.
1.3.6.3 Symptoms:
- Presence of tiny, white, flying insects on the undersides of leaves

- Yellowing and premature wilting of leaves
- Sticky honeydew on leaves and surrounding surfaces
- Growth of sooty mold on honeydew-covered surfaces
1.3.6.4 Prevention Methods:
- Use reflective mulches to repel whiteflies
- Implement proper irrigation practices to avoid water stress
- Plant trap crops like sunflower or castor around cotton fields
- Use yellow sticky traps for monitoring and control
1.3.6.5 Treatment/Cure:
- Home-based: Spray a mixture of neem oil and water on affected plants
- Chemical control: Acetamiprid (₹800-1,000 per kg) or Diafenthiuron (₹1,500-1,800 per kg)
- Use insect growth regulators like pyriproxyfen

1.3.7 Disease Name: Pink Bollworm
1.3.7.1 Causal Agent:
Insect - Pectinophora gossypiella
1.3.7.2 Disease Description:
The pink bollworm is a serious pest of cotton that primarily attacks cotton bolls. The larvae feed inside the bolls, damaging seeds and fibers, which leads to significant yield losses and reduced fiber quality. It thrives in warm climates and can complete multiple generations in a single growing season.
1.3.7.3 Symptoms:
- Small, circular holes in bolls
- Intertwined cotton fibers within bolls
- Presence of pink-colored larvae inside bolls
- Rosette flowers (petals fail to open fully)
1.3.7.4 Prevention Methods:
- Practice early crop termination and plow-down
- Use pheromone traps for monitoring and mating disruption
- Implement crop rotation with non-host plants
- Plant Bt cotton varieties where approved
1.3.7.5 Treatment/Cure:
- Home-based: Remove and destroy infested bolls
- Chemical control: Chlorantraniliprole (₹3,000-3,500 per liter) or Thiodicarb (₹800-1,000 per kg)
- Release egg parasitoids like Trichogramma species

1.3.8 Disease Name: Red Cotton Bug
1.3.8.1 Causal Agent:
Insect - Dysdercus cingulatus
1.3.8.2 Disease Description:
The red cotton bug is a pest that primarily affects cotton during the boll opening stage. Both nymphs and adults feed on cotton seeds, causing significant damage to yield and fiber quality. They also stain the lint with their excreta, further reducing its value.
1.3.8.3 Symptoms:

- Presence of red-colored insects on bolls and open cotton
- Yellowing and premature drying of leaves
- Staining of cotton lint
- Reduced boll size and weight

1.3.8.4 Prevention Methods:
- Remove alternative host plants like okra and hibiscus from nearby areas
- Implement proper field sanitation practices
- Use trap crops like okra or hollyhock around cotton fields
- Avoid staggered sowing in the same area

1.3.8.5 Treatment/Cure:
- Home-based: Handpick and destroy insects, use neem-based preparations
- Chemical control: Malathion (₹400-500 per liter) or Cypermethrin (₹500-600 per liter)
- Apply diatomaceous earth around plants as a physical barrier

1.3.9 Disease Name: Thrips

1.3.9.1 Causal Agent:

Insect - Various species, including Thrips tabaci and Frankliniella schultzei

1.3.9.2 Disease Description:

Thrips are tiny insects that feed on cotton plants by puncturing and sucking the contents of plant cells. They can cause significant damage to young cotton plants, leading to stunted growth and reduced yield. Thrips can also transmit viral diseases, further impacting crop health.

1.3.9.3 Symptoms:
- Silvery or bronzed appearance of leaves
- Curling and distortion of leaves
- Stunted plant growth
- Scarring on the surfaces of leaves and stems

1.3.9.4 Prevention Methods:
- Use reflective mulches to repel thrips
- Implement proper irrigation to avoid water stress
- Plant trap crops like sunflower or marigold around cotton fields
- Use blue sticky traps for monitoring and control

1.3.9.5 Treatment/Cure:
- Home-based: Spray a mixture of insecticidal soap and water on affected plants
- Chemical control: Imidacloprid (₹500-700 per liter) or Fipronil (₹1,500-1,800 per liter)
- Apply spinosad-based products for organic control

2.1 Crop Name: Rice (Oryza sativa)

2.2 Brief Description:

Rice is a staple food crop for more than half of the world's population. It is an annual grass that thrives in warm, humid climates. Rice cultivation plays a crucial role in food security, economic development, and cultural traditions in many Asian countries.

2.3 Diseases:

2.3.1 Disease Name: Bacterial Blight

2.3.1.1 Causal Agent:
Bacteria - Xanthomonas oryzae pv. oryzae
2.3.1.2 Disease Description:
Bacterial blight is a serious disease of rice that can cause significant yield losses. It is favored by high humidity, high temperatures, and heavy rainfall. The disease can affect rice plants at any growth stage, from seedling to maturity, and is particularly severe in susceptible varieties.
2.3.1.3 Symptoms:
- Water-soaked lesions on leaves that turn yellow to white
- Wilting and drying of leaves
- Milky or opaque dew drops on young lesions
- Stunted growth and reduced grain quality
2.3.1.4 Prevention Methods:
- Use disease-resistant rice varieties
- Practice crop rotation with non-host plants
- Maintain proper field sanitation
- Avoid excessive nitrogen fertilization
2.3.1.5 Treatment/Cure:
- Home-based: Remove and destroy infected plants
- Chemical control: Streptomycin sulfate + Tetracycline combination (₹1,200-1,500 per kg)
- Copper-based bactericides like copper oxychloride (₹350-450 per kg)
- Silicon fertilization to enhance plant resistance

3. CROP INFORMATION
3.1 Crop Name: Wheat (Triticum aestivum)
3.2 Brief Description:
Wheat is one of the world's most important cereal grains, providing a significant portion of global calories and protein. It is an annual grass cultivated in temperate regions and plays a crucial role in global food security and the agricultural economy.

3.3 Diseases:
3.3.1 Disease Name: Wheat Stem Fly
3.3.1.1 Causal Agent:
Insect - Atherigona naqvii
3.3.1.2 Disease Description:
Wheat stem fly is a serious pest that affects wheat crops, particularly in South Asia. The larvae feed inside the wheat stems, causing damage to the central shoot and leading to yield losses. Infestations are more severe in late-sown crops and under drought conditions.
3.3.1.3 Symptoms:
- Dead hearts (central shoot dies)
- Stunted plant growth
- Yellowing of the youngest leaf
- Empty white heads (white ears) in later stages
3.3.1.4 Prevention Methods:

- Early sowing of wheat crops
- Use of resistant varieties
- Maintain proper field sanitation
- Implement crop rotation with non-host plants
3.3.1.5 Treatment/Cure:
- Home-based: Remove and destroy infested plants
- Chemical control: Imidacloprid seed treatment (₹1,500-2,000 per kg of seed treatment formulation)
- Spray Cypermethrin (₹500-600 per liter) or Chlorpyrifos (₹400-500 per liter) at early stages of infestation

3.3.2 Disease Name: Wheat Brown Leaf Rust
3.3.2.1 Causal Agent:
Fungus - Puccinia triticina
3.3.2.2 Disease Description:
Brown leaf rust is a common fungal disease of wheat that can cause significant yield losses. It thrives in warm, humid conditions and can spread rapidly through wind-borne spores. The disease reduces photosynthetic area and increases water loss, leading to reduced grain filling.
3.3.2.3 Symptoms:
- Small, round to oval, orange-brown pustules on leaves
- Chlorotic areas surrounding pustules
- Premature leaf senescence in severe cases
- Reduced grain size and quality
3.3.2.4 Prevention Methods:
- Plant resistant wheat varieties
- Practice crop rotation with non-host crops
- Remove volunteer wheat plants
- Early sowing to avoid favorable conditions for the pathogen
3.3.2.5 Treatment/Cure:
- Home-based: Remove and destroy infected plant debris
- Chemical control: Propiconazole (₹1,200-1,500 per liter) or Tebuconazole (₹800-1,000 per liter)
- Apply foliar fungicides at the first sign of disease

3.3.3 Disease Name: Wheat Aphid
3.3.3.1 Causal Agent:
Insect - Various species, including Rhopalosiphum padi and Sitobion avenae
3.3.3.2 Disease Description:
Wheat aphids are small, soft-bodied insects that feed on wheat plants by sucking sap. They can cause direct damage through feeding and also transmit viral diseases. Severe infestations can lead to reduced yield and grain quality.
3.3.3.3 Symptoms:
- Yellowing and curling of leaves
- Stunted plant growth

- Presence of honeydew and sooty mold on leaves
- Reduced tillering and head formation
3.3.3.4 Prevention Methods:
- Use resistant wheat varieties
- Implement proper crop rotation
- Encourage natural predators like ladybugs and lacewings
- Avoid excessive nitrogen fertilization
3.3.3.5 Treatment/Cure:
- Home-based: Spray a mixture of neem oil and water on affected plants
- Chemical control: Thiamethoxam (₹1,200-1,500 per kg) or Acetamiprid (₹800-1,000 per kg)
- Apply insecticidal soaps or horticultural oils for organic control

3.3.4 Disease Name: Wheat Black Rust
3.3.4.1 Causal Agent:
Fungus - Puccinia graminis f. sp. tritici
3.3.4.2 Disease Description:
Black rust, also known as stem rust, is a devastating disease of wheat that can cause severe yield losses. It thrives in warm, humid conditions and can spread rapidly over large areas. The disease affects stems, leaves, and heads of wheat plants.
3.3.4.3 Symptoms:
- Reddish-brown, elongated pustules on stems and leaves
- Pustules turn black as the plant matures
- Ruptured epidermis around pustules
- Weakened stems leading to lodging
3.3.4.4 Prevention Methods:
- Plant resistant wheat varieties
- Implement regional disease monitoring and early warning systems
- Practice crop rotation with non-host plants
- Eliminate alternate hosts like barberry in the vicinity
3.3.4.5 Treatment/Cure:
- Home-based: Early detection and removal of infected plants
- Chemical control: Tebuconazole (₹800-1,000 per liter) or Azoxystrobin (₹2,000-2,500 per liter)
- Foliar application of systemic fungicides at the first sign of infection

3.3.5 Disease Name: Wheat Leaf Blight
3.3.5.1 Causal Agent:
Fungus - Bipolaris sorokiniana (Helminthosporium leaf blight)
3.3.5.2 Disease Description:
Wheat leaf blight is a fungal disease that affects leaves, stems, and heads of wheat plants. It can cause significant yield losses, especially in warm and humid conditions. The disease reduces photosynthetic area and can lead to shriveled grains.
3.3.5.3 Symptoms:
- Dark brown, elongated lesions on leaves
- Lesions may have yellow halos

- Discoloration and darkening of nodes and internodes
- Black point on kernels in severe cases
3.3.5.4 Prevention Methods:
- Use disease-free, certified seeds
- Practice crop rotation with non-host crops
- Ensure proper field drainage
- Maintain optimal plant spacing for good air circulation
3.3.5.5 Treatment/Cure:
- Home-based: Remove and destroy infected plant debris
- Chemical control: Propiconazole (₹1,200-1,500 per liter) or Mancozeb (₹300-400 per kg)
- Seed treatment with Carboxin + Thiram (₹800-1,000 per kg of treatment)

3.3.6 Disease Name: Wheat Mite
3.3.6.1 Causal Agent:
Arachnid - Aceria tulipae (Wheat curl mite)
3.3.6.2 Disease Description:
Wheat mites are tiny arachnids that feed on wheat plants, causing direct damage and transmitting viral diseases like Wheat Streak Mosaic Virus. They thrive in warm, dry conditions and can cause significant yield losses in affected fields.
3.3.6.3 Symptoms:
- Curling and rolling of leaves
- Stunted plant growth
- Chlorotic streaks on leaves (often due to transmitted viruses)
- Reduced head size and grain fill
3.3.6.4 Prevention Methods:
- Eliminate volunteer wheat and grassy weeds
- Plant wheat varieties resistant to wheat curl mite or wheat streak mosaic virus
- Adjust planting dates to avoid peak mite activity
- Maintain field borders free of grass hosts
3.3.6.5 Treatment/Cure:
- Home-based: Increase humidity around plants (mites prefer dry conditions)
- Chemical control: Sulfur-based acaricides (₹200-300 per kg)
- Dimethoate (₹500-600 per liter) for severe infestations
- Note: Chemical control is often not economical; prevention is key

3.3.7 Disease Name: Wheat Powdery Mildew
3.3.7.1 Causal Agent:
Fungus - Blumeria graminis f. sp. tritici
3.3.7.2 Disease Description:
Powdery mildew is a fungal disease that affects wheat leaves, stems, and heads. It thrives in cool, humid conditions and can cause significant yield losses by reducing photosynthetic area and grain fill. The disease is more severe in dense canopies and high-nitrogen environments.
3.3.7.3 Symptoms:
- White, powdery patches on leaves, stems, and heads

- Chlorotic spots beneath the powdery growth
- Stunted plant growth in severe cases
- Reduced tillering and grain fill

3.3.7.4 Prevention Methods:
- Plant resistant wheat varieties
- Avoid excessive nitrogen fertilization
- Ensure proper plant spacing for good air circulation
- Practice crop rotation with non-host crops

3.3.7.5 Treatment/Cure:
- Home-based: Spray a mixture of baking soda and water on affected plants
- Chemical control: Tebuconazole (₹800-1,000 per liter) or Azoxystrobin (₹2,000-2,500 per liter)
- Apply foliar fungicides at the first sign of infection
- Use silicon-based fertilizers to enhance plant resistance

3.3.8 Disease Name: Healthy Wheat

3.3.8.1 Causal Agent:
Not applicable (this is not a disease)

3.3.8.2 Description:
Healthy wheat plants exhibit vigorous growth, uniform green color, and normal development of all plant parts. Maintaining plant health involves proper agronomic practices and timely management of potential threats.

3.3.8.3 Characteristics:
- Deep green leaves with no discoloration or damage
- Strong, upright stems without lesions or abnormalities
- Well-formed heads with plump, fully developed kernels
- Uniform plant stand and growth

3.3.8.4 Maintenance Methods:
- Implement proper soil fertility management
- Ensure adequate irrigation, especially during critical growth stages
- Practice integrated pest management (IPM)
- Use high-quality, certified seeds

3.3.8.5 Promoting Plant Health:
- Regular monitoring for early detection of pests and diseases
- Balanced application of nutrients based on soil tests
- Timely weed control to reduce competition
- Proper plant spacing for optimal growth and air circulation

4.1 Crop Name: Sugarcane (Saccharum officinarum)

4.2 Brief Description:
Sugarcane is a tall, perennial grass cultivated for its sweet sap, which is processed to produce sugar and various by-products. It is a major cash crop in tropical and subtropical regions, playing a significant role in the agricultural economies of many countries.

4.3 Diseases:

4.3.1 Disease Name: Mosaic Sugarcane
4.3.1.1 Causal Agent:
Virus - Sugarcane mosaic virus (SCMV)
4.3.1.2 Disease Description:
Sugarcane mosaic is a viral disease that affects sugarcane crops worldwide. It reduces plant vigor, sugar content, and overall yield. The virus is transmitted by aphids and can also spread through infected planting material.
4.3.1.3 Symptoms:
- Light green or yellowish mosaic patterns on leaves
- Stunted plant growth
- Reduced tillering
- Thinner stalks with shorter internodes
4.3.1.4 Prevention Methods:
- Use virus-free planting material
- Plant resistant varieties
- Control aphid populations
- Practice proper field sanitation
4.3.1.5 Treatment/Cure:
- Home-based: Remove and destroy infected plants
- There is no cure for viral diseases; focus on prevention
- Manage aphid vectors using neem-based insecticides
- Roguing (removal) of infected plants to prevent spread

4.3.2 Disease Name: Red Rot Sugarcane
4.3.2.1 Causal Agent:
Fungus - Colletotrichum falcatum
4.3.2.2 Disease Description:
Red rot is a serious fungal disease of sugarcane that affects the stalk internally. It can cause significant yield losses and reduce sugar content. The disease thrives in warm, humid conditions and can spread rapidly through infected planting material.
4.3.2.3 Symptoms:
- Red discoloration of internal stalk tissues
- White patches with red spots (resembling a straw mat) when stalk is split
- Drying of leaves, starting from the tips
- Sour alcoholic odor from affected stalks
4.3.2.4 Prevention Methods:
- Use disease-free planting material
- Plant resistant varieties
- Practice crop rotation
- Ensure proper field drainage
4.3.2.5 Treatment/Cure:
- Home-based: Remove and destroy infected plants
- Chemical control: Propiconazole (₹1,200-1,500 per liter) as a preventive measure
- Hot water treatment of setts (planting material) at 50°C for 2 hours

- Biological control using Trichoderma viride (₹200-250 per kg)

4.3.3 Disease Name: Red Rust Sugarcane
4.3.3.1 Causal Agent:
Fungus - Puccinia kuehnii
4.3.3.2 Disease Description:
Red rust is a fungal disease that affects sugarcane leaves. It can cause significant yield losses in susceptible varieties, especially under favorable environmental conditions. The disease reduces photosynthetic area and plant vigor.
4.3.3.3 Symptoms:
- Reddish-brown pustules on leaf surfaces
- Elongated lesions parallel to leaf veins
- Premature leaf drying in severe cases
- Stunted plant growth
4.3.3.4 Prevention Methods:
- Plant resistant varieties
- Avoid excessive nitrogen fertilization
- Ensure proper plant spacing for good air circulation
- Practice field sanitation by removing crop debris
4.3.3.5 Treatment/Cure:
- Home-based: Remove and destroy infected leaves
- Chemical control: Propiconazole (₹1,200-1,500 per liter) or Triadimefon (₹800-1,000 per kg)
- Apply foliar fungicides at the first sign of infection
- Use balanced fertilization to improve plant resistance

4.3.4 Disease Name: Yellow Rust Sugarcane
4.3.4.1 Causal Agent:
Fungus - Puccinia melanocephala
4.3.4.2 Disease Description:
Yellow rust is a fungal disease that primarily affects sugarcane leaves. It can cause significant yield losses, especially in susceptible varieties and under favorable environmental conditions. The disease reduces photosynthetic area and overall plant health.
4.3.4.3 Symptoms:
- Yellow to orange pustules on leaf surfaces
- Elongated lesions parallel to leaf veins
- Chlorotic areas surrounding pustules
- Premature leaf senescence in severe cases
4.3.4.4 Prevention Methods:
- Plant resistant varieties
- Implement proper crop rotation
- Maintain optimal plant nutrition
- Avoid excessive irrigation, especially overhead irrigation
4.3.4.5 Treatment/Cure:
- Home-based: Remove and destroy infected leaves

- Chemical control: Pyraclostrobin (₹2,000-2,500 per liter) or Azoxystrobin (₹2,000-2,500 per liter)
- Apply foliar fungicides preventively in high-risk areas
- Use silicon-based fertilizers to enhance plant resistance

5.1 Crop Name: Maize (Zea mays)
5.2 Brief Description:
Maize, also known as corn, is a versatile cereal grain cultivated globally for food, feed, and industrial purposes. It is an annual plant that adapts to various climates and plays a significant role in global agriculture and food security.

5.3 Diseases:
5.3.1 Disease Name: Maize Ear Rot
5.3.1.1 Causal Agent:
Various fungi, including Fusarium spp., Aspergillus spp., and Penicillium spp.
5.3.1.2 Disease Description:
Maize ear rot is a complex of fungal diseases that affect corn ears, leading to reduced yield and grain quality. These diseases can also produce mycotoxins, which are harmful to humans and animals. Ear rots are favored by warm, humid conditions and insect damage to ears.
5.3.1.3 Symptoms:
- Discoloration of kernels (white, pink, red, or green, depending on the pathogen)
- Moldy growth on and between kernels
- Premature drying and lightweight ears
- Shrunken or chaffy kernels
5.3.1.4 Prevention Methods:
- Plant resistant hybrids
- Practice crop rotation with non-host crops
- Ensure proper harvesting and storage conditions
- Control insects that can damage ears
5.3.1.5 Treatment/Cure:
- Home-based: Timely harvesting and proper drying of grain
- Chemical control: Tebuconazole (₹800-1,000 per liter) or Carbendazim (₹400-600 per kg) as preventive sprays
- Biological control using Trichoderma-based products

5.3.2 Disease Name: Fall Armyworm
5.3.2.1 Causal Agent:
Insect - Spodoptera frugiperda
5.3.2.2 Disease Description:
The fall armyworm is an invasive pest that causes significant damage to maize crops. It feeds on leaves, stems, and reproductive parts of the plant, leading to severe yield losses. The pest can complete its life cycle rapidly and spread quickly across large areas.
5.3.2.3 Symptoms:
- Ragged, irregular holes in leaves

- Damage to tassels and ears
- Presence of frass (insect excrement) in leaf whorls
- Skeletonized leaves in severe infestations
5.3.2.4 Prevention Methods:
- Early planting and use of short-duration varieties
- Implement push-pull strategy using companion crops
- Use pheromone traps for monitoring
- Encourage natural enemies like parasitic wasps
5.3.2.5 Treatment/Cure:
- Home-based: Handpick and destroy larvae, apply neem-based preparations
- Chemical control: Spinetoram (₹3,500-4,000 per liter) or Emamectin benzoate (₹1,500-1,800 per kg)
- Biological control using Bacillus thuringiensis (Bt) formulations

5.3.3 Disease Name: Maize Stem Borer
5.3.3.1 Causal Agent:
Insect - Various species, including Chilo partellus and Busseola fusca
5.3.3.2 Disease Description:
Maize stem borers are serious pests that can cause significant yield losses in corn. The larvae bore into the stem, disrupting nutrient flow and weakening the plant. This can lead to lodging, poor ear development, and reduced yield.
5.3.3.3 Symptoms:
- Small holes and "sawdust-like" frass on stems and leaves
- Dead heart (dead central shoot) in young plants
- Broken stems and lodging in older plants
- Tunneling inside stems and cobs
5.3.3.4 Prevention Methods:
- Practice crop rotation with non-host plants
- Implement proper field sanitation, including destruction of crop residues
- Use trap crops like Napier grass around maize fields
- Plant maize varieties with natural resistance
5.3.3.5 Treatment/Cure:
- Home-based: Remove and destroy infested plants
- Chemical control: Chlorantraniliprole (₹3,000-3,500 per liter) or Flubendiamide (₹1,800-2,200 per kg)
- Biological control using parasitic wasps like Cotesia flavipes

5.3.4 Disease Name: Healthy Maize
5.3.4.1 Causal Agent:
Not applicable (this is not a disease)
5.3.4.2 Description:
Healthy maize plants exhibit vigorous growth, uniform green color, and normal development of all plant parts. Maintaining plant health involves proper agronomic practices and timely management of potential threats.

5.3.4.3 Characteristics:
- Deep green leaves with no discoloration or damage
- Strong, sturdy stalks without lesions or holes
- Well-formed ears with fully developed kernels
- Uniform plant stand and growth

5.3.4.4 Maintenance Methods:
- Implement proper soil fertility management
- Ensure adequate irrigation
- Practice integrated pest management (IPM)
- Use high-quality, certified seeds

5.3.4.5 Promoting Plant Health:
- Regular monitoring for early detection of pests and diseases
- Balanced application of nutrients based on soil tests
- Timely weed control to reduce competition
- Proper plant spacing for optimal growth and air circulation