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CROP INFORMATION

1.1 Crop Name: Cotton (Gossypium spp.)

1.2 Brief Description:
Cotton is a crucial fiber crop widely grown for its soft, fluffy fibers, which are spun into yarn to make textiles. It is a key agricultural product in many countries and also provides valuable by-products like cottonseed oil.

1.3 Diseases:

1.3.1 Disease Name: American Bollworm

1.3.1.1 Causal Agent:
Helicoverpa armigera (insect pest)

1.3.1.2 Disease Description:
The American Bollworm is a destructive pest of cotton, feeding on the reproductive parts of the plant, leading to significant yield losses. It thrives in warm, humid conditions and can be difficult to manage due to its resistance to many insecticides.

1.3.1.3 Symptoms:
- Boreholes in bolls.
- Damaged flowers and buds.
- Shed fruiting bodies.

1.3.1.4 Prevention Methods:
- Use of resistant cotton varieties.
- Regular monitoring and pheromone traps.
- Crop rotation to break the life cycle.

1.3.1.5 Treatment/Cure:
- **Home-based:** Neem oil spray.
- **Chemical Controls:** Spinosad (cost: ₹800-₹1000 per liter).
- **Additional Management Strategies:** Biological control using Trichogramma species.

1.3.2 Disease Name: Anthracnose on Cotton

1.3.2.1 Causal Agent:

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Colletotrichum gossypii

1.3.2.2 Disease Description:
Anthracnose is a fungal disease that affects cotton, leading to dark, sunken lesions on stems, leaves, and bolls. The disease thrives in wet conditions and can cause significant losses if not managed properly.

1.3.2.3 Symptoms:
- Dark, sunken spots on stems and bolls.
- Wilting and dropping of leaves.
- Premature boll opening.

1.3.2.4 Prevention Methods:
- Use of disease-free seeds.
- Crop rotation with non-host plants.
- Avoiding overhead irrigation.

1.3.2.5 Treatment/Cure:
- **Home-based:** Application of compost tea.
- **Chemical Controls:** Mancozeb (cost: ₹300-₹400 per kg).
- **Additional Management Strategies:** Ensure proper field drainage.

1.3.3 Disease Name: Armyworm

1.3.3.1 Causal Agent:
Spodoptera spp. (insect pest)

1.3.3.2 Disease Description:
Armyworms are highly destructive pests that attack a wide range of crops, including cotton and maize. They are called "armyworms" because they travel in large groups and can devastate fields in a short period.

1.3.3.3 Symptoms:
- Skeletonized leaves.
- Large areas of defoliation.
- Chewed leaf margins.

1.3.3.4 Prevention Methods:
- Regular monitoring and early detection.
- Maintaining field sanitation.
- Use of pheromone traps.

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1.3.3.5 Treatment/Cure:
- **Home-based:** Soap spray to dislodge larvae.
- **Chemical Controls:** Chlorantraniliprole (cost: ₹1500-₹2000 per liter).
- **Additional Management Strategies:** Encourage natural predators like birds.

1.3.4 Disease Name: Bacterial Blight in Rice

1.3.4.1 Causal Agent:
Xanthomonas oryzae pv. oryzae

1.3.4.2 Disease Description:
Bacterial Blight is a severe disease in rice that can lead to significant yield losses, especially in regions with high humidity. It is spread through water and infected plant material and affects the vascular system of the rice plant.

1.3.4.3 Symptoms:
- Yellowing of leaf edges.
- Water-soaked lesions turning brown.
- Wilted leaves and reduced grain quality.

1.3.4.4 Prevention Methods:
- Use of resistant varieties.
- Proper field sanitation.
- Controlled water management.

1.3.4.5 Treatment/Cure:
- **Home-based:** Use of cow dung slurry.
- **Chemical Controls:** Streptomycin Sulfate + Tetracycline Hydrochloride (cost: ₹200-₹300 per 100 g).
- **Additional Management Strategies:** Crop rotation with non-host crops.

1.3.5 Disease Name: Brownspot in Rice

1.3.5.1 Causal Agent:
Bipolaris oryzae

1.3.5.2 Disease Description:
Brownspot is a fungal disease that affects rice, causing small, dark brown lesions on leaves, which can reduce photosynthetic efficiency and result in lower yields. It is most prevalent in nutrient-deficient soils and under drought conditions.

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1.3.5.3 Symptoms:
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- Small brown spots on leaves.
- Lesions with a grayish center.
- Leaf drying and death in severe cases.

1.3.5.4 Prevention Methods:
- Balanced fertilization, especially with potassium.
- Use of resistant varieties.
- Field sanitation.

1.3.5.5 Treatment/Cure:
- **Home-based:** Rice bran spray.
- **Chemical Controls:** Propiconazole (cost: ₹500-₹700 per liter).
- **Additional Management Strategies:** Improve soil health through organic amendments.

1.3.6 Disease Name: Common Rust in Maize

1.3.6.1 Causal Agent:
Puccinia sorghi

1.3.6.2 Disease Description:
Common Rust is a fungal disease that affects maize, leading to pustules on leaves and stems. The disease is spread by wind-borne spores and is most severe in cool, wet conditions.

1.3.6.3 Symptoms:
- Reddish-brown pustules on leaves.
- Yellowing of leaves around pustules.
- Reduced photosynthesis and stunted growth.

1.3.6.4 Prevention Methods:
- Use of resistant maize varieties.
- Proper crop rotation.
- Field sanitation.

1.3.6.5 Treatment/Cure:
- **Home-based:** Application of sulfur powder.
- **Chemical Controls:** Azoxystrobin (cost: ₹700-₹900 per liter).
- **Additional Management Strategies:** Ensure good air circulation in the field.

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1.3.7 Disease Name: Cotton Aphid

1.3.7.1 Causal Agent:
Aphis gossypii (insect pest)

1.3.7.2 Disease Description:
Cotton Aphid is a common pest that feeds on the sap of cotton plants, weakening the plant and reducing yield. It also excretes honeydew, which leads to the growth of sooty mold on leaves.

1.3.7.3 Symptoms:
- Curling and yellowing of leaves.
- Presence of sticky honeydew.
- Sooty mold development on leaves.

1.3.7.4 Prevention Methods:
- Use of natural predators like ladybugs.
- Regular monitoring and removal of infested leaves.
- Avoiding excessive nitrogen fertilization.

1.3.7.5 Treatment/Cure:
- **Home-based:** Soap and water spray.
- **Chemical Controls:** Imidacloprid (cost: ₹500-₹700 per liter).
- **Additional Management Strategies:** Use of reflective mulches to deter aphids.

1.3.8 Disease Name: Flag Smut in Wheat

1.3.8.1 Causal Agent:
Urocystis tritici

1.3.8.2 Disease Description:
Flag Smut is a fungal disease that affects wheat, leading to stunted growth and reduced yield. The fungus primarily attacks the leaves and stems, causing dark streaks and a characteristic "flagging" of leaves.

1.3.8.3 Symptoms:
- Dark streaks on leaves and stems.
- Leaves curling and flagging.
- Stunted growth and poor tillering.

1.3.8.4 Prevention Methods:
- Use of certified, disease-free seed.
- Crop rotation with non-host crops.

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XAvoid planting wheat in infected fields for several years.

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1.3.8.5 Treatment/Cure:
- **Home-based:** Seed treatment with ash and cow urine.
- **Chemical Controls:** Tebuconazole (cost: ₹400-₹600 per liter).
- **Additional Management Strategies:** Deep plowing to bury fungal spores.

1.3.9 Disease Name: Gray Leaf Spot in Maize

1.3.9.1 Causal Agent:
Cercospora zeae-maydis

1.3.9.2 Disease Description:
Gray Leaf Spot is a fungal disease in maize that can cause significant yield losses. It manifests as grayish lesions on the leaves, reducing the plant's photosynthetic capacity and leading to premature leaf death.

1.3.9.3 Symptoms:
- Small, grayish lesions on leaves.
- Lesions merging to form large dead areas.
- Early leaf senescence and reduced grain filling.

1.3.9.4 Prevention Methods:
- Use of resistant maize hybrids.
- Crop rotation and residue

management.
- Avoid late planting and dense stands.

1.3.9.5 Treatment/Cure:
- **Home-based:** Baking soda spray.
- **Chemical Controls:** Pyraclostrobin (cost: ₹1000-₹1200 per liter).
- **Additional Management Strategies:** Apply foliar fungicides at the early tasseling stage.

1.3.10 Disease Name: Leaf Curl in Cotton

1.3.10.1 Causal Agent:
Cotton Leaf Curl Virus (CLCuV)

1.3.10.2 Disease Description:

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Leaf Curl is a viral disease transmitted by whiteflies, causing significant damage to cotton crops. The virus causes leaves to curl and thicken, leading to stunted growth and reduced yields.
X

1.3.10.3 Symptoms:
- Curling and thickening of leaves.
- Vein swelling and enations on the underside of leaves.
- Stunted plant growth and poor boll development.

1.3.10.4 Prevention Methods:
- Use of resistant cotton varieties.
- Control of whitefly populations.
- Removal of infected plants from the field.

1.3.10.5 Treatment/Cure:
- **Home-based:** Garlic extract spray to deter whiteflies.
- **Chemical Controls:** Imidacloprid (cost: ₹500-₹700 per liter).
- **Additional Management Strategies:** Intercropping with non-host plants to reduce virus spread.

1.3.11 Disease Name: Leaf Smut in Rice

1.3.11.1 Causal Agent:
Entyloma oryzae

1.3.11.2 Disease Description:
Leaf Smut is a minor fungal disease affecting rice, leading to black, sooty spots on leaves. Although it generally does not cause severe yield losses, it can weaken plants and reduce their overall health.

1.3.11.3 Symptoms:
- Black, sooty spots on leaves.
- Premature leaf senescence.
- Reduced plant vigor.

1.3.11.4 Prevention Methods:
- Use of resistant rice varieties.
- Proper field sanitation and removal of crop debris.
- Avoid excessive nitrogen fertilization.

1.3.11.5 Treatment/Cure:
- **Home-based:** Application of neem cake to soil.
- **Chemical Controls:** Carbendazim (cost: ₹200-₹300 per kg).

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- **Additional Management Strategies:** Maintain proper water management to reduce disease spread.

1.3.12 Disease Name: Mosaic in Sugarcane

1.3.12.1 Causal Agent:
Sugarcane mosaic virus (SCMV)

1.3.12.2 Disease Description:
Mosaic is a viral disease affecting sugarcane, leading to mottled, chlorotic patterns on leaves. It is spread by aphids and can lead to reduced cane growth and lower sugar content.

1.3.12.3 Symptoms:
- Mottled, yellowish patterns on leaves.
- Stunted growth and poor tillering.
- Reduced sugar yield.

1.3.12.4 Prevention Methods:
- Use of resistant sugarcane varieties.
- Control of aphid vectors.
- Removal of infected plants from the field.

1.3.12.5 Treatment/Cure:
- **Home-based:** Application of neem oil to control aphids.
- **Chemical Controls:** Imidacloprid (cost: ₹500-₹700 per liter).
- **Additional Management Strategies:** Implement crop rotation to manage virus incidence.

1.3.13 Disease Name: Red Rot in Sugarcane

1.3.13.1 Causal Agent:
Colletotrichum falcatum

1.3.13.2 Disease Description:
Red Rot is a devastating fungal disease in sugarcane, causing reddening of the internal tissues and leading to the collapse of the plant. It is a major concern in sugarcane-growing regions, especially under wet conditions.

1.3.13.3 Symptoms:
- Red discoloration of internal stalk tissues.
- Longitudinal splitting of stalks.

X

X

XSweet, fermenting odor from affected stalks.

X
1.3.13.4 Prevention Methods:
- Use of resistant sugarcane varieties.
- Proper drainage of fields to avoid waterlogging.
- Regular inspection and removal of infected canes.

1.3.13.5 Treatment/Cure:
- **Home-based:** Application of lime to soil.
- **Chemical Controls:** Copper oxychloride (cost: ₹250-₹350 per kg).
- **Additional Management Strategies:** Implement clean seed programs to prevent the spread of the disease.

1.3.14 Disease Name: Red Rust in Sugarcane

1.3.14.1 Causal Agent:
Cephaleuros virescens

1.3.14.2 Disease Description:
Red Rust is an algal disease that affects sugarcane, leading to orange-red spots on leaves and reducing the photosynthetic efficiency of the plant. It is most prevalent in warm, humid regions.

1.3.14.3 Symptoms:
- Orange-red spots on leaves.
- Thickening of affected leaf areas.
- Premature leaf senescence.

1.3.14.4 Prevention Methods:
- Use of resistant sugarcane varieties.
- Proper field sanitation and crop rotation.
- Avoiding overhead irrigation.

1.3.14.5 Treatment/Cure:
- **Home-based:** Spraying with copper sulfate solution.
- **Chemical Controls:** Bordeaux mixture (cost: ₹150-₹250 per kg).
- **Additional Management Strategies:** Ensure good air circulation in the field to reduce humidity.

1.3.15 Disease Name: Rice Blast

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1.3.15.1 Causal Agent:
Magnaporthe oryzae

1.3.15.2 Disease Description:
Rice Blast is one of the most destructive fungal diseases of rice, causing lesions on leaves, stems, and panicles, leading to significant yield losses. The disease thrives in warm, humid conditions and can spread rapidly through spores.

1.3.15.3 Symptoms:
- Diamond-shaped lesions with gray centers on leaves.
- Rotten neck or collar rot at the base of the panicle.
- Premature plant death and reduced grain quality.

1.3.15.4 Prevention Methods:
- Use of resistant rice varieties.
- Proper water management to avoid excessive wetness.
- Avoiding excessive nitrogen fertilization.

1.3.15.5 Treatment/Cure:
- **Home-based:** Rice bran or turmeric spray.
- **Chemical Controls:** Tricyclazole (cost: ₹500-₹700 per kg).
- **Additional Management Strategies:** Rotate with non-host crops to reduce inoculum levels.

1.3.16 Disease Name: Tungro in Rice

1.3.16.1 Causal Agent:
Rice tungro virus (RTV)

1.3.16.2 Disease Description:
Tungro is a viral disease in rice that causes stunting, yellowing, and reduced tillering, leading to significant yield losses. The virus is transmitted by green leafhoppers and is most severe in tropical regions.

1.3.16.3 Symptoms:
- Stunted growth and reduced tillering.
- Yellow-orange discoloration of leaves.
- Poor grain filling and reduced yields.

1.3.16.4 Prevention Methods:
- Use of resistant rice varieties.
- Control of leafhopper populations.
- Timely planting to avoid peak vector activity.

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X
1.3.16.5 Treatment/Cure:
- **Home-based:** Garlic extract spray to deter leafhoppers.
- **Chemical Controls:** Imidacloprid (cost: ₹500-₹700 per liter).
- **Additional Management Strategies:** Field sanitation and removal of infected plants.

1.3.17 Disease Name: Wheat Brown Leaf Rust

1.3.17.1 Causal Agent:
Puccinia recondita

1.3.17.2 Disease Description:
Brown Leaf Rust is a fungal disease affecting wheat, causing orange-brown pustules on leaves, which can lead to significant yield losses. The disease is spread by wind-borne spores and is most severe in cool, wet conditions.

1.3.17.3 Symptoms:
- Orange-brown pustules on leaves.
- Leaf yellowing and necrosis.
- Reduced photosynthetic efficiency and grain filling.

1.3.17.4 Prevention Methods:
- Use of resistant wheat varieties.
- Crop rotation and field sanitation.
- Avoiding dense planting to ensure good air circulation.

1.3.17.5 Treatment/Cure:
- **Home-based:** Sulfur spray.
- **Chemical Controls:** Propiconazole (cost: ₹500-₹700 per liter).
- **Additional Management Strategies:** Apply foliar fungicides at the onset of symptoms.

1.3.18 Disease Name: Wheat Stem Fly

1.3.18.1 Causal Agent:
Meromyza americana (insect pest)

1.3.18.2 Disease Description:
Wheat Stem Fly is a pest that attacks the stems of wheat plants, causing them to weaken and lodge, leading to reduced yields. The fly larvae feed inside the stem, causing internal damage.

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1.3.18.3 Symptoms:
- Stems withered and blackened at the base.
- Lodging and poor plant vigor.
- Hollowed-out stems with larvae inside.

1.3.18.4 Prevention Methods:
- Early sowing to escape peak fly activity.
-

Crop rotation with non-host plants.
- Field sanitation and destruction of crop residues.

1.3.18.5 Treatment/Cure:
- **Home-based:** Ash and lime dusting at the base of plants.
- **Chemical Controls:** Thiamethoxam (cost: ₹700-₹900 per liter).
- **Additional Management Strategies:** Encourage natural predators like ground beetles.

1.3.19 Disease Name: Wheat Aphid

1.3.19.1 Causal Agent:
Sitobion avenae (insect pest)

1.3.19.2 Disease Description:
Wheat Aphid is a common pest that feeds on the sap of wheat plants, leading to weakened plants and reduced yields. Aphids also transmit viral diseases in wheat.

1.3.19.3 Symptoms:
- Curling and yellowing of leaves.
- Presence of sticky honeydew.
- Sooty mold development on leaves.

1.3.19.4 Prevention Methods:
- Use of natural predators like ladybugs.
- Regular monitoring and removal of infested leaves.
- Avoiding excessive nitrogen fertilization.

1.3.19.5 Treatment/Cure:
- **Home-based:** Soap and water spray.
- **Chemical Controls:** Imidacloprid (cost: ₹500-₹700 per liter).
- **Additional Management Strategies:** Use of reflective mulches to deter aphids.

X

X

1.3.20 Disease Name: Wheat Black Rust

1.3.20.1 Causal Agent:
Puccinia graminis

1.3.20.2 Disease Description:
Black Rust, also known as stem rust, is a serious fungal disease affecting wheat, leading to the formation of black pustules on stems and leaves. The disease can cause significant yield losses if not managed.

1.3.20.3 Symptoms:
- Black, powdery pustules on stems and leaves.
- Weakening of stems, leading to lodging.
- Reduced grain filling and quality.

1.3.20.4 Prevention Methods:
- Use of resistant wheat varieties.
- Crop rotation and removal of volunteer wheat plants.
- Proper field sanitation.

1.3.20.5 Treatment/Cure:
- **Home-based:** Spraying with cow dung slurry.
- **Chemical Controls:** Propiconazole (cost: ₹500-₹700 per liter).
- **Additional Management Strategies:** Apply foliar fungicides at the early boot stage.

1.3.21 Disease Name: Wheat Leaf Blight

1.3.21.1 Causal Agent:
Septoria tritici

1.3.21.2 Disease Description:
Leaf Blight is a fungal disease affecting wheat, leading to the formation of elongated, necrotic lesions on leaves. The disease reduces the photosynthetic area of the plant, leading to lower yields.

1.3.21.3 Symptoms:
- Long, brown necrotic lesions on leaves.
- Leaf yellowing and premature death.
- Reduced grain filling and yield.

1.3.21.4 Prevention Methods:

X

X

XUse of resistant wheat varieties.
- Crop rotation and field sanitation.
X
- Avoiding dense planting to ensure good air circulation.

1.3.21.5 Treatment/Cure:
- **Home-based:** Garlic extract spray.
- **Chemical Controls:** Azoxystrobin (cost: ₹700-₹900 per liter).
- **Additional Management Strategies:** Ensure proper field drainage to avoid prolonged leaf wetness.

1.3.22 Disease Name: Wheat Mite

1.3.22.1 Causal Agent:
Aceria tosichella (insect pest)

1.3.22.2 Disease Description:
Wheat Mite is a pest that feeds on the sap of wheat plants, causing yellowing and curling of leaves. The mites are also vectors for several viral diseases in wheat.

1.3.22.3 Symptoms:
- Curling and yellowing of leaves.
- Stunted growth and reduced tillering.
- Presence of webbing on leaves.

1.3.22.4 Prevention Methods:
- Use of resistant wheat varieties.
- Regular monitoring and early intervention.
- Avoiding excessive nitrogen fertilization.

1.3.22.5 Treatment/Cure:
- **Home-based:** Soap and water spray.
- **Chemical Controls:** Abamectin (cost: ₹1000-₹1200 per liter).
- **Additional Management Strategies:** Use of sulfur dust to deter mites.

1.3.23 Disease Name: Wheat Powdery Mildew

1.3.23.1 Causal Agent:
Blumeria graminis f.sp. tritici

1.3.23.2 Disease Description:

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Powdery Mildew is a fungal disease affecting wheat, leading to white, powdery patches on leaves and stems. The disease thrives in cool, dry conditions and can cause significant yield losses if not controlled.

1.3.23.3 Symptoms:
- White, powdery patches on leaves and stems.
- Leaf yellowing and premature death.
- Reduced photosynthetic efficiency and yield.

1.3.23.4 Prevention Methods:
- Use of resistant wheat varieties.
- Proper crop rotation and field sanitation.
- Avoiding dense planting to ensure good air circulation.

1.3.23.5 Treatment/Cure:
- **Home-based:** Milk spray (diluted 1:10 with water).
- **Chemical Controls:** Sulfur (cost: ₹200-₹300 per kg).
- **Additional Management Strategies:** Apply foliar fungicides at the onset of symptoms.

1.3.24 Disease Name: Wheat Scab

1.3.24.1 Causal Agent:
Fusarium graminearum

1.3.24.2 Disease Description:
Wheat Scab, also known as Fusarium head blight, is a fungal disease affecting wheat, leading to shriveled, discolored grains. The disease is most severe in wet conditions during flowering and can produce mycotoxins harmful to humans and animals.

1.3.24.3 Symptoms:
- Bleached spikelets on heads.
- Pink or orange spore masses on infected spikelets.
- Shriveled, discolored grains.

1.3.24.4 Prevention Methods:
- Use of resistant wheat varieties.
- Proper crop rotation and field sanitation.
- Avoiding late planting in areas prone to wet conditions during flowering.

1.3.24.5 Treatment/Cure:
- **Home-based:** Application of baking soda spray.
- **Chemical Controls:** Prothioconazole (cost: ₹1500-₹1800 per liter).

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- **Additional Management Strategies:** Ensure proper field drainage to reduce humidity levels.

1.3.25 Disease Name: Wheat Yellow Rust

1.3.25.1 Causal Agent:
Puccinia striiformis f.sp. tritici

1.3.25.2 Disease Description:
Yellow Rust is a fungal disease affecting wheat, leading to yellow, stripe-like lesions on leaves. The disease can spread rapidly under cool, wet conditions and cause significant yield losses.

1.3.25.3 Symptoms:
- Yellow, stripe-like lesions on leaves.
- Leaf yellowing and premature death.
- Reduced photosynthetic efficiency and yield.

1.3.25.4 Prevention Methods:
- Use of resistant wheat varieties.
- Crop rotation and field sanitation.
- Avoiding dense planting to ensure good air circulation.

1.3.25.5 Treatment/Cure:
- **Home-based:** Garlic extract spray.
- **Chemical Controls:** Propiconazole (cost: ₹500-₹700 per liter).
- **Additional Management Strategies:** Apply foliar fungicides at the onset of symptoms.

1.3.26 Disease Name: Wilt in Cotton

1.3.26.1 Causal Agent:
Fusarium oxysporum f.sp. vasinfectum

1.3.26.2 Disease Description:
Wilt is a fungal disease affecting cotton, causing wilting and yellowing of leaves, leading to plant death. The fungus invades the plant's vascular system, blocking the flow of water and nutrients.

1.3.26.3 Symptoms:
- Wilting and yellowing of leaves.
- Browning of vascular tissues in stems.
- Stunted growth and poor boll development.

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1.3.26.4 Prevention Methods:
- Use of resistant cotton varieties.
- Proper field sanitation and crop rotation.
- Avoiding excessive irrigation and waterlogging.

1.3.26.5 Treatment/Cure:
- **Home-based:** Soil solarization before planting.
- **Chemical Controls:** Carbendazim (cost: ₹200-₹300 per kg).
- **Additional Management Strategies:** Improve soil drainage to prevent fungal spread.

1.3.27 Disease Name: Yellow Rust in Sugarcane

1.3.27.1 Causal Agent:
Puccinia kuehnii

1.3.27.2 Disease Description:
Yellow Rust is a fungal disease affecting sugarcane, leading to yellowish-orange pustules on leaves, which can reduce photosynthesis and yield. The disease thrives in warm, humid conditions and can spread rapidly.

1.3.27.3 Symptoms:
- Yellowish-orange pustules on leaves.
- Leaf yellowing and premature death.
- Reduced cane growth and sugar content.

1.3.27.4 Prevention Methods:
- Use of resistant sugarcane varieties.
- Proper crop rotation and field sanitation.
- Avoiding dense

planting to ensure good air circulation.

1.3.27.5 Treatment/Cure:
- **Home-based:** Spraying with neem oil.
- **Chemical Controls:** Propiconazole (cost: ₹500-₹700 per liter).
- **Additional Management Strategies:** Apply foliar fungicides at the onset of symptoms.

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2. Insect Control in Crop Cultivation

2.1 List of Insect Pests with Effective Treatments

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2.1.1 Insect Name: Cotton Bollworm

2.1.1.1 Description:
Cotton Bollworm (Helicoverpa armigera) is a major pest in cotton cultivation, feeding on the bolls and causing significant yield losses. The larvae bore into the bolls, reducing the quality and quantity of cotton produced.

2.1.1.2 Symptoms:
- Bored holes in cotton bolls.
- Presence of frass around the bolls.
- Stunted growth and poor boll development.

2.1.1.3 Control Methods:
- **Home-based:** Application of neem oil spray.
- **Chemical Controls:** Spinosad (cost: ₹1500-₹2000 per liter).
- **Biological Controls:** Release of Trichogramma wasps as egg parasitoids.
- **Additional Management Strategies:** Regular monitoring and timely intervention.

2.1.2 Insect Name: Rice Brown Planthopper

2.1.2.1 Description:
The Rice Brown Planthopper (Nilaparvata lugens) is a sap-sucking insect that causes severe damage to rice plants. The insect injects toxic saliva while feeding, leading to hopper burn and plant death.

2.1.2.2 Symptoms:
- Yellowing and wilting of leaves.
- Hopper burn, where the plant turns brown and dries up.
- Stunted growth and reduced grain filling.

2.1.2.3 Control Methods:
- **Home-based:** Garlic and chili spray to deter planthoppers.
- **Chemical Controls:** Imidacloprid (cost: ₹500-₹700 per liter).
- **Biological Controls:** Introduction of natural predators like spiders and mirid bugs.
- **Additional Management Strategies:** Avoiding excessive nitrogen fertilization to reduce planthopper attraction.

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2.1.3 Insect Name: Sugarcane Top Borer

X
2.1.3.1 Description:
The Sugarcane Top Borer (Scirpophaga excerptalis) is a pest that bores into the top portion of the sugarcane, causing the central leaf to wither and die. The larvae feed inside the cane, leading to reduced sugar yield and cane breakage.

2.1.3.2 Symptoms:
- Dead hearts in the central shoot.
- Boreholes in the top portion of the cane.
- Reduced cane growth and sugar content.

2.1.3.3 Control Methods:
- **Home-based:** Application of neem cake to the soil.
- **Chemical Controls:** Chlorantraniliprole (cost: ₹1200-₹1500 per liter).
- **Biological Controls:** Release of Trichogramma wasps as egg parasitoids.
- **Additional Management Strategies:** Regular monitoring and removal of affected canes.

2.1.4 Insect Name: Whitefly in Cotton

2.1.4.1 Description:
Whitefly (Bemisia tabaci) is a major pest in cotton cultivation, sucking sap from the leaves and transmitting viral diseases. Heavy infestations can lead to leaf yellowing, defoliation, and reduced cotton yield.

2.1.4.2 Symptoms:
- Yellowing and curling of leaves.
- Presence of sticky honeydew and sooty mold.
- Stunted growth and poor boll development.

2.1.4.3 Control Methods:
- **Home-based:** Spraying with a mixture of neem oil and soap solution.
- **Chemical Controls:** Imidacloprid (cost: ₹500-₹700 per liter).
- **Biological Controls:** Release of natural predators like ladybugs and lacewings.
- **Additional Management Strategies:** Use of reflective mulches to deter whiteflies.

2.1.5 Insect Name: Stem Borer in Rice

2.1.5.1 Description:

X

X

XThe Stem Borer (Scirpophaga incertulas) is a serious pest in rice cultivation, boring into the stem and causing dead hearts and whiteheads. The larvae feed inside the stem, leading to reduced grain filling and yield.
X

2.1.5.2 Symptoms:
- Dead hearts in young plants.
- Whiteheads in mature plants.
- Hollowed-out stems with larvae inside.

2.1.5.3 Control Methods:
- **Home-based:** Application of neem oil spray.
- **Chemical Controls:** Chlorantraniliprole (cost: ₹1200-₹1500 per liter).
- **Biological Controls:** Release of Trichogramma wasps as egg parasitoids.
- **Additional Management Strategies:** Regular monitoring and timely removal of affected plants.

2.1.6 Insect Name: Thrips in Cotton

2.1.6.1 Description:
Thrips (Thrips tabaci) are small, slender insects that feed on the sap of cotton leaves, leading to silvering and curling of leaves. Heavy infestations can cause stunted growth and poor boll development.

2.1.6.2 Symptoms:
- Silvering and curling of leaves.
- Stunted growth and poor boll development.
- Presence of black fecal spots on leaves.

2.1.6.3 Control Methods:
- **Home-based:** Spraying with a mixture of neem oil and soap solution.
- **Chemical Controls:** Spinosad (cost: ₹1500-₹2000 per liter).
- **Biological Controls:** Introduction of natural predators like Orius bugs.
- **Additional Management Strategies:** Avoiding excessive nitrogen fertilization to reduce thrips attraction.

2.1.7 Insect Name: Mealybug in Cotton

2.1.7.1 Description:

X

X

XMealybug (Phenacoccus solenopsis) is a sap-sucking pest that affects cotton plants, leading to leaf curling, stunted growth, and poor boll development. The pest excretes honeydew, leading to the growth of sooty mold.
X

2.1.7.2 Symptoms:
- Curling and yellowing of leaves.
- Presence of white, cottony masses on leaves and stems.
- Stunted growth and poor boll development.

2.1.7.3 Control Methods:
- **Home-based:** Spraying with a mixture of neem oil and soap solution.
- **Chemical Controls:** Imidacloprid (cost: ₹500-₹700 per liter).
- **Biological Controls:** Release of natural predators like ladybugs and parasitic wasps.
- **Additional Management Strategies:** Regular monitoring and timely removal of infested plants.

2.1.8 Insect Name: Rice Gall Midge

2.1.8.1 Description:
The Rice Gall Midge (Orseolia oryzae) is a pest that causes the formation of galls (silvery tubes) on rice plants, leading to stunted growth and reduced tillering. The larvae feed inside the galls, causing the plant to produce sterile shoots.

2.1.8.2 Symptoms:
- Formation of silvery galls on stems.
- Stunted growth and reduced tillering.
- Presence of sterile shoots and reduced grain yield.

2.1.8.3 Control Methods:
- **Home-based:** Application of neem cake to the soil.
- **Chemical Controls:** Chlorantraniliprole (cost: ₹1200-₹1500 per liter).
- **Biological Controls:** Release of natural predators like Platygaster oryzae (parasitoid wasp).
- **Additional Management Strategies:** Early planting to avoid peak gall midge activity.

2.1.9 Insect Name: Armyworm in Wheat

2.1.9.1 Description:
Armyworm (Mythimna separata) is a pest that attacks wheat plants, feeding on the leaves and stems. Heavy infestations can lead to defoliation and reduced grain filling, resulting in significant yield losses.

X

X

X
2.1.9.2 Symptoms:
X
- Chewed leaves and stems.
- Presence of frass around the base of plants.
- Stunted growth and poor grain filling.

2.1.9.3 Control Methods:
- **Home-based:** Application of neem oil spray.
- **Chemical Controls:** Chlorantraniliprole (cost: ₹1200-₹1500 per liter).
- **Biological Controls:** Release of natural predators like ground beetles and parasitic wasps.
- **Additional Management Strategies:** Regular monitoring and timely removal of affected plants.

2.1.10 Insect Name: Jassid in Cotton

2.1.10.1 Description:
Jassid (Amrasca biguttula biguttula) is a sap-sucking insect that affects cotton plants, causing yellowing and curling of leaves. Heavy infestations can lead to stunted growth and poor boll development.

2.1.10.2 Symptoms:
- Yellowing and curling of leaves.
- Stunted growth and poor boll development.
- Presence of honeydew and sooty mold on leaves.

2.1.10.3 Control Methods:
- **Home-based:** Spraying with a mixture of neem oil and soap solution.
- **Chemical Controls:** Imidacloprid (cost: ₹

500-₹700 per liter).
- **Biological Controls:** Introduction of natural predators like ladybugs and lacewings.
- **Additional Management Strategies:** Avoiding excessive nitrogen fertilization to reduce jassid attraction.

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