Disease Name: Powdery Mildew Category: Fungal Symptoms: Leaf Symptoms: Appearance: White to grayish-white powdery patches on the upper leaf surface. Patches are superficial and can often be rubbed off initially. Spread: Patches often start small and round, then expand and merge, potentially covering the entire upper leaf surface. Severity: In severe cases, patches may also appear on the underside of leaves. Stem & Bud Symptoms: Growth: Similar powdery growth on stems and flower buds. Effects: May lead to distortion, stunted growth, and reduced flowering or fruiting. Progression: Expansion: Powdery patches expand rapidly, especially in favorable conditions. Leaf Reaction: Causes leaf curling, yellowing, and eventually leaf drop if untreated. Location: Primarily affects upper leaf surfaces, but also stems, and buds. Can spread to lower leaf surfaces in severe cases. Key Features for Identification: - White to grayish-white powdery coating on plant surfaces (like sprinkled flour or talcum powder) - Predominantly on upper leaf surfaces, but also affects stems and buds - Leads to leaf curling, yellowing, and distortion of new growth - Thrives in warm (68-80°F, 20-27°C), dry conditions with high humidity (especially at night) Remedy: Product: Bonide Sulfur Plant Fungicide (Sulfur) Active Ingredient: Sulfur Application Instructions: Method: Dust or spray. For spraying, mix as per label instructions (usually 2-4 tablespoons per gallon of water). Timing: Apply at first sign of disease. Reapply every 7-10 days, or after rain, as long as conditions favor disease development. Best Time of Day: Early morning or late evening to avoid leaf burn in strong sunlight and allow foliage to dry before nightfall. Frequency: Weekly applications may be needed in severe cases. Reduce frequency as the disease comes under control. Safety Precautions: - Wear gloves and eye protection during application. - Avoid application in temperatures above 90°F (32°C) as sulfur can cause plant injury in high heat. - Do not apply sulfur within 2 weeks of applying oil sprays. - Keep children and pets away from treated areas until dusts or sprays have dried.

Disease Name: Downy Mildew Category: Fungal Symptoms: Leaf Symptoms (Upper Surface): Appearance: Yellow angular spots form on the upper leaf surface. Spots are often pale yellow to yellow-green. Vein Limitation: Spots are characteristically limited by leaf veins, resulting in angular shapes and a mosaic-like patchy appearance. Leaf Symptoms (Underside): Growth: A grayish to purplish fuzzy fungal growth develops on the underside of infected leaves, directly beneath the yellow spots on the upper surface. Conditions: Fuzzy growth is most prominent in humid or damp conditions, especially in the morning or after rain. Progression: Spot Development: Yellow spots enlarge and may turn brown or necrotic (dead tissue) as the disease progresses. Leaf Reaction: May cause leaf curling, distortion, or premature leaf drop. Fuzzy Growth Intensification: The fuzzy growth on the underside intensifies and may sporulate, spreading the infection. Location: Primarily affects upper leaf surfaces (yellow spots) and leaf undersides (fuzzy growth). Older leaves are often affected first. Key Features for Identification: - Angular yellow spots on upper leaf surfaces, limited by leaf veins - Grayish to purplish fuzzy fungal growth on leaf undersides, visible in humid conditions - Spots confined by leaf veins create a distinct angular pattern - Worsens in humid, damp conditions (cool, wet weather) - Yellow spots on top, fuzzy growth underneath Remedy: Product: Aliette (Fosetyl-al) Active Ingredient: Fosetyl-al Application Instructions: Method: Foliar spray. Mix as per label instructions (typically 1-1.5 teaspoons per gallon of water). Systemic fungicide, absorbed by plant tissue. Timing: Apply preventatively or at the first sign of disease. Early application is crucial as a protectant. Best Time of Day: Apply in the morning to allow foliage to dry before evening. Avoid application during the hottest part of the day. Frequency: Reapply every 14-21 days, or as indicated on the product label, especially during periods of high disease risk. Safety Precautions: - Wear gloves and eye protection when mixing and applying. - Avoid spraying on windy days to prevent drift. -Ensure good coverage of both upper and lower leaf surfaces for best results. - Follow re-entry intervals (REI) specified on the label before re-entering treated areas.

Disease Name: Late Blight Category: Fungal Symptoms: Leaf Symptoms: Appearance: Dark brown to black water-soaked lesions appear on leaves. Lesions are often irregular in shape. Starting Point: Lesions often start at leaf tips or edges and rapidly expand inwards. Texture: Lesions have a characteristic oily or water-soaked appearance, especially at the margins. Stem Symptoms: Lesions: Brown-black oily lesions form on stems. Stems may become soft or mushy in the affected areas. Severity: Stem lesions can girdle the stem, leading to plant collapse, especially in young or succulent growth. Leaf Underside: Growth: In humid conditions, a white fuzzy fungal growth may develop on the underside of infected leaves, particularly around the edges of lesions. Progression: Rapid Expansion: Lesions enlarge very rapidly, often becoming visible overnight in favorable (wet, cool) conditions. Plant Decline: Causes rapid leaf wilting, browning, and overall plant decline. Can destroy entire plants quickly. Location: Affects leaves (lesions, starting at edges), stems (oily lesions), and leaf undersides (fuzzy growth in humidity). Can affect all above-ground parts of the plant, including fruits/tubers in some plants like tomatoes and potatoes. Key Features for Identification: - Dark brown to black water-soaked lesions on leaves, expanding rapidly - Brown-black oily lesions on stems, potentially leading to stem collapse - White fuzzy growth on the underside of leaves in humid conditions (not always present) - Rapid disease progression, especially in cool, wet weather Remedy: Product: Daconil Fungicide (Chlorothalonil) Active Ingredient: Chlorothalonil Application Instructions: Method: Protective foliar spray. Mix as per label instructions (typically 1.5 teaspoons per gallon of water). Contact fungicide, needs thorough coverage. Timing: Apply preventatively before disease onset, especially when cool, wet weather is expected. Begin applications when conditions favor disease. Best Time of Day: Apply in the morning to allow foliage to dry before evening and minimize the chance of spores developing overnight. Frequency: Reapply every 7-10 days, or more frequently (e.g., every 5-7 days) during periods of heavy rain or high humidity. Safety Precautions: - Wear gloves, long sleeves, and eye protection. Consider a respirator when mixing and spraying. - Avoid applying before rain if possible, but reapply after heavy rainfall. - Do not apply more than the maximum applications per season as specified on the label. - Allow spray to dry completely before entering treated areas.

Disease Name: Rust Category: Fungal Symptoms: Leaf Symptoms: Appearance: Orange to reddishbrown raised powdery pustules (small raised bumps) appear on leaf surfaces. Pustules often occur in clusters. Color Change: Pustules start bright orange and may darken to reddish-brown as they mature. Leaf Reaction: Leaves may yellow, curl, and drop prematurely, particularly in severe infections. Stem Symptoms: Pustules: In some cases, similar powdery pustules may develop on stems, though leaves are the primary target. Stem pustules are less common than leaf pustules. Progression: Spore Release: The pustules readily release spores that are easily spread by wind and water splash, leading to rapid disease spread to other plants. Cycle: Rust diseases often have complex life cycles, sometimes involving alternate host plants, but on the primary host, the pustules are the key symptom. Location: Primarily affects leaf surfaces, occasionally spreading to stems in severe cases. Can affect both upper and lower leaf surfaces. Key Features for Identification: - Raised powdery pustules, bright orange to reddish-brown color (like rust on metal) - Clusters of pustules primarily on leaf surfaces, may also be on stems - Leads to leaf yellowing, curling, and premature leaf drop - Spreads easily through windborne spores; can quickly infect nearby plants Remedy: Product: Bayer Propiconazole Fungicide (Propiconazole) Active Ingredient: Propiconazole Application Instructions: Method: Systemic foliar spray. Mix as per label directions (usually 0.5-1 fl oz per gallon of water). Systemic action helps to eradicate existing infections and protect new growth. Timing: Apply at the first sign of rust pustules. Early intervention is more effective in controlling rust. Best Time of Day: Apply in the morning to allow foliage to dry thoroughly during the day. Avoid application in the heat of the day. Frequency: Reapply every 14-21 days, or as needed based on

disease pressure and product label recommendations. Safety Precautions: - Wear gloves and protective eyewear. - Avoid inhalation of spray mist. Use in well-ventilated areas or wear a respirator if needed. - Do not apply to plants under stress (e.g., drought, extreme temperatures). - Rotate fungicides with different active ingredients to prevent fungicide resistance. Disease Name: Anthracnose Category: Fungal Symptoms: Leaf Symptoms: Appearance: Dark brown sunken lesions with lighter tan to grayish centers forming on leaves. Lesions vary in size and shape. Spot Development: Infected leaves may initially develop small, irregular spots that expand over time to become larger lesions. "Shot-hole" effect: In some plants, the lighter centers of lesions may dry and fall out, creating a "shot-hole" appearance. Stem & Fruit Symptoms: Lesions: Similar sunken lesions appear on stems and fruits. Stem lesions can girdle young stems. Fruit lesions can cause rot. Spore Masses: Often, salmon-pink to orange spore masses are visible in the center of the lesions, especially under humid conditions. These are more pronounced on stems and fruits than leaves. Progression: Lesion Coalescence: Lesions grow larger and may coalesce (merge together), leading to extensive tissue damage and collapse. Fruit Drop: Can cause premature fruit drop and significant yield loss. Location: Primarily affects leaves, stems, and fruits. Can also affect twigs and branches in some hosts. Key Features for Identification: - Dark brown sunken lesions with lighter centers (tan to grayish) - Salmon-pink to orange spore masses often visible in lesion centers, especially in high humidity - Affects multiple plant parts, including leaves, stems, and fruits (wide host range) - Tissue decay and potential fruit loss in severe cases - Sunken lesions are a key characteristic Remedy: Product: Bonide Liquid Copper Fungicide (Copper Soap) Active Ingredient: Copper Soap (Copper Octanoate) Application Instructions: Method: Protective fungicide spray. Mix according to label instructions (usually 2-4 tablespoons per gallon of water). Contact fungicide, requires thorough coverage. Timing: Apply at the first sign of disease or preventatively when conditions are favorable for Anthracnose (warm, wet weather). Best Time of Day: Apply in the morning or late afternoon/early evening to avoid rapid drying in strong sunlight. Frequency: Reapply every 7-10 days, especially during wet periods, or as indicated on the label. Safety Precautions: - Wear gloves and eye protection. - Avoid applying in very hot weather as copper can sometimes cause leaf damage in high temperatures. - Check plant-specific sensitivity to copper before widespread application. - Do not apply more frequently than recommended on the label to avoid copper buildup in soil. Disease Name: Bacterial Wilt Category: Bacterial Symptoms: Foliage Symptoms: Wilting: Sudden wilting of green leaves without prior yellowing. Wilting is often rapid and dramatic, appearing within a day or two. Green Collapse: Leaves may remain green and appear turgid initially, but quickly collapse and droop as if lacking water, even when soil moisture is adequate. Stem Symptoms: Vascular Ooze Test: Cut stems near the base. In plants with bacterial wilt, stems will release a milky white to yellowish bacterial ooze due to the high concentration of bacteria in the vascular tissue. Vascular Discoloration: Internal vascular tissues show brown discoloration when the stem is cut open. Discoloration is often in streaks or rings within the vascular bundles. Progression: Rapid Wilting: Rapid and irreversible wilting is the hallmark. Often affects the entire plant, or significant sections, in a short period. Systemic Spread: Disease spreads quickly through the vascular system, blocking water transport from roots to leaves. Location: Affects the entire foliage (sudden wilting) and stems (bacterial ooze upon cutting, vascular discoloration). Roots and vascular system are the primary sites of infection. Key Features for Identification: - Sudden wilting of foliage without prior yellowing (green wilt) - Milky white to yellowish bacterial ooze from cut stems (diagnostic test) -Brown vascular discoloration visible inside stems when cut - Rapid plant decline due to blocked water transport systemically Remedy: Product: Agri-Mycin 17 (Streptomycin sulfate) Active Ingredient: Streptomycin sulfate (antibiotic) Application Instructions: Method: Soil drench or foliar spray. For soil

drench, mix as per label (e.g., 1-2 teaspoons per gallon of water) and apply to the soil around the base of the plant. For foliar spray, use a lower concentration and apply to foliage. Timing: Apply at the first sign of wilt symptoms. Early intervention is more likely to be effective, although bacterial wilt is very challenging to control once established. Best Time of Day: Apply in the morning or evening to allow for better absorption and reduce evaporation. For soil drench, ensure soil is moist before application. Frequency: Reapply every 7-10 days if symptoms persist or as recommended on the product label. Bacterial wilt is difficult to cure, and repeated applications may only slow disease progress. Important Notes & Precautions: - Agri-Mycin is an antibiotic; use judiciously to prevent resistance development. - Bacterial wilt is often fatal. Sanitation is crucial. Remove and destroy infected plants (do not compost). - Sterilize tools after working with infected plants. - Improve soil drainage and avoid overwatering to reduce conditions favorable for bacterial wilt. - In cases of severe bacterial wilt, prevention in future plantings is often the most effective strategy (crop rotation, resistant varieties if available, soil solarization).

Disease Name: Mosaic Virus Category: Viral Symptoms: Leaf Symptoms: Mottling Pattern: Irregular light green to yellow mottling patterns appear on the leaf surface. Creates a characteristic "mosaic" or marbled effect. Border Definition: Affected areas have sharp, distinct borders separating normal green tissue from yellowed or light green sections. The mottling pattern is not diffuse or gradual. Variation: Mottling patterns can vary in intensity; some leaves may have mild mottling, while others may be severely affected with extensive yellow areas. Texture Changes: Wrinkling & Curling: Leaves may appear wrinkled, curled, or slightly distorted. Leaf surface may be uneven or puckered in mosaic-affected areas. Stunting: Growth may be stunted in severe cases. Plant may be smaller than healthy plants. Location: Primarily affects leaf surfaces, where the mottling pattern is most visible. Systemic virus, can be present throughout the plant, but symptoms are most apparent on leaves. Key Features for Identification: - Irregular mosaic-like mottling on leaves (light green to yellow patterns), not uniform spots - Sharp, well-defined borders between healthy green and mottled/yellowed areas -Potential leaf curling, wrinkling, or distortion; overall plant stunting in severe cases - Absence of fungal growth or lesions. No powdery coating, pustules, or water-soaked lesions (viral infection only) - Vector-borne spread (often aphids, thrips, sometimes seed or mechanical transmission) Remedy: No direct cure. Prevention: Bayer Advanced 3-in-1 Insect Disease & Mite Control (Imidaclopridbased) to prevent aphid spread. Prevention and Management Instructions: Product for Prevention: Bayer Advanced 3-in-1 Insect Disease & Mite Control (Imidacloprid-based) for aphid control (vector). Active Ingredient: Imidacloprid (systemic insecticide). Note: Imidacloprid targets aphids that can spread mosaic viruses; it does not cure the virus itself. Management Strategy (If Virus Detected): - No Cure: Mosaic viruses cannot be cured with chemical treatments. Once a plant is infected, it remains infected for life. - Removal: Promptly remove and destroy infected plants to prevent virus spread to healthy plants. Do not compost infected plants. - Vector Control: Focus on controlling insect vectors, especially aphids and thrips, which transmit many mosaic viruses. Use insecticides as needed and monitor regularly for pests. - Sanitation: Practice good garden sanitation. Control weeds that can harbor viruses and insect vectors. Clean tools regularly. - Resistant Varieties: If available, plant virusresistant varieties in the future. Application Instructions for Prevention (Vector Control): Method: Soil drench or foliar spray with Imidacloprid-based insecticide to control aphids. Follow label

instructions