

Diseases Of Vegetables

Diseases Of Vegetables diseases of vegetables pose a significant challenge to farmers, gardeners, and home growers alike. These diseases can lead to reduced crop yields, poor vegetable quality, and economic losses if not identified and managed promptly. Understanding the common types of vegetable diseases, their symptoms, causes, and prevention methods is essential for maintaining healthy plants and ensuring a bountiful harvest. This article explores the most prevalent diseases affecting vegetables, offering valuable insights into their identification and control strategies.

Common Diseases of Vegetables Vegetables are susceptible to a wide range of diseases caused by fungi, bacteria, viruses, and other pathogens. The most common illnesses include blights, molds, wilts, spots, and rots, each affecting different parts of the plant and exhibiting distinct symptoms.

Fungal Diseases of Vegetables Fungal pathogens are among the most widespread causes of vegetable diseases. They thrive in moist, warm environments and can spread rapidly through spores.

- 1. Late Blight (*Phytophthora infestans*)** Late blight is a notorious disease affecting tomatoes and potatoes but can also infect other vegetables like eggplants.
 - Symptoms: Dark, water-soaked lesions on leaves, stems, and fruit; white mold growth under humid conditions.
 - Impact: Causes rapid plant decline and significant loss of yield.
 - Control Measures: Use resistant varieties when available Apply fungicides at early signs of infection Ensure proper crop spacing and avoid overhead watering Remove infected plant debris
- 2. Powdery Mildew** Affects many vegetables including cucumbers, zucchini, and melons.
 - Symptoms: White, powdery fungal growth on leaf surfaces, stems, and sometimes fruits.
 - Impact: Reduced photosynthesis, distorted growth, and poor fruit quality.
 - Control Measures: Improve air circulation around plants Apply sulfur-based fungicides or neem oil Water at the base of plants to keep foliage dry
- 2 Remove and destroy infected plant parts**
- 3. Fusarium Wilt** A soil-borne disease affecting tomatoes, peppers, and eggplants.
 - Symptoms: Yellowing and wilting of leaves, often starting on one side of the plant, with browning of vascular tissues.
 - Impact: Plant death if untreated.
 - Control Measures: Use resistant varieties Practice crop rotation with non-host crops Improve soil drainage and health Remove and destroy infected plants

Bacterial Diseases of Vegetables Bacterial infections can cause severe damage and are often spread through contaminated water, soil, or tools.

- 1. Bacterial Spot** Common in peppers and tomatoes.
 - Symptoms: Small, dark, water-soaked spots on leaves and fruits; lesions may enlarge and cause leaf drop.
 - Impact: Reduced photosynthesis and fruit quality.
 - Control Measures:

Use disease-resistant varieties Apply copper-based bactericides as a preventive measure Practice crop rotation and proper sanitation Avoid working with plants when wet

2. Bacterial Wilt

Primarily affects cucurbits like cucumbers and melons. - Symptoms: Sudden wilting of plants, often without yellowing; vascular tissue may appear discolored. - Impact: Rapid plant death. - Control Measures: Remove and destroy infected plants Control cucumber beetle populations (which spread bacteria) Practice crop rotation Maintain healthy soil and plant vigor

Viral Diseases of Vegetables

Viruses can be especially tricky to manage since they are transmitted by vectors like insects and often cause persistent infections.

3 1. Tomato Mosaic Virus

Affects tomatoes and other solanaceous crops. - Symptoms: Mottled or mosaic patterns on leaves, stunted growth, and deformed fruits. - Impact: Significant yield reduction. - Control Measures: Use virus-free seeds and resistant varieties Control aphids and whiteflies (vectors) Remove infected plants promptly Implement crop rotation

2. Cucumber Mosaic Virus

Infects cucumbers, melons, peppers, and other vegetables. - Symptoms: Mottled leaves, stunted plants, and malformed fruits. - Impact: Reduced quality and yield. - Control Measures: Control insect vectors Plant resistant varieties Remove infected plants Practice clean cultivation methods

Vegetable Rots and Decays

Rot diseases often occur due to overwatering or poor drainage, leading to fungal or bacterial decay.

1. Crown and Root Rot

Caused by fungi like *Fusarium* or *Pythium*. - Symptoms: Wilting, yellowing, and rotting at the base of the plant. - Impact: Plant death if not managed. - Control Measures: Ensure well-drained soil Use sterilized soil and pots Apply appropriate fungicides Practice crop rotation

2. Fruit Rot

Affects vegetables like tomatoes, peppers, and zucchinis. - Symptoms: Soft, decayed areas on fruits, often with mold or foul smell. - Impact: Loss of marketable produce. - Control Measures: Harvest fruits promptly when ripe

4 Reduce humidity and improve air circulation

Apply fungicides if necessary Practice proper sanitation

Integrated Disease Management for Vegetables

Managing vegetable diseases effectively requires a combination of cultural, biological, and chemical strategies. Here are some essential practices:

1. Crop Rotation Rotating crops to non-host plants breaks the disease cycle and reduces pathogen buildup in the soil.
2. Resistant Varieties Choose disease-resistant or tolerant vegetable varieties whenever possible.
3. Proper Sanitation Remove and destroy infected plant debris, weeds, and volunteers that can harbor pathogens.
4. Optimal Cultural Practices Maintain proper spacing, watering practices (avoid overhead watering), and fertilization to promote healthy, vigorous plants.
5. Use of Biological Controls Employ beneficial microorganisms like *Trichoderma* or *Bacillus subtilis* to suppress pathogen development.
6. Chemical Controls Apply fungicides, bactericides, or other chemical treatments as a last resort, following label instructions and safety precautions.

Conclusion

Understanding the diseases of vegetables is crucial for effective management and

ensuring healthy, productive crops. Recognizing early symptoms and implementing integrated control measures can significantly reduce the impact of these diseases. Regular monitoring, good cultural practices, resistant varieties, and timely interventions form the backbone of successful vegetable disease management. By staying vigilant and adopting a proactive approach, gardeners and farmers can minimize losses and enjoy healthy, delicious vegetables throughout the growing season.

Question What are common viral diseases affecting vegetable crops? Common viral diseases in vegetables include Tomato Mosaic Virus, Cucumber Mosaic Virus, and Zucchini Yellow Mosaic Virus. These viruses can cause mottling, stunting, and yield loss, and are often spread through insect vectors or contaminated tools.

Answer How can bacterial diseases in vegetables be controlled? Bacterial diseases such as bacterial wilt and leaf spot can be managed through crop rotation, using disease-free planting material, practicing proper sanitation, and applying appropriate bactericides or copper-based compounds where necessary.

What are the signs of fungal infections in vegetable plants? Signs of fungal infections include powdery or downy mold on leaves, rotting stems, spots with fuzzy or moldy growth, and wilting. Common fungal diseases are powdery mildew, downy mildew, and Fusarium wilt.

Which environmental conditions favor vegetable diseases, and how can they be mitigated? High humidity, excessive moisture, poor air circulation, and temperature fluctuations promote many vegetable diseases. Proper spacing, crop rotation, and ensuring good drainage can reduce disease incidence.

Are there resistant varieties available for common vegetable diseases? Yes, many vegetable varieties are bred for resistance to specific diseases such as Fusarium-resistant tomatoes or powdery mildew-resistant zucchinis, which help reduce disease outbreaks when combined with good management practices.

What integrated disease management strategies can be used for vegetables? Integrated management includes crop rotation, resistant varieties, proper watering practices, timely application of organic or chemical controls, sanitation, and monitoring to prevent and manage vegetable diseases effectively.

Diseases of Vegetables: An Expert Guide to Identification, Prevention, and Management Vegetable cultivation is a cornerstone of global agriculture, providing essential nutrients and economic livelihood to millions. However, the health of vegetable crops is often threatened by a wide array of diseases, which can cause significant yield loss, reduce quality, and incur substantial economic costs. Understanding these diseases—how they manifest, spread, and can be controlled—is crucial for farmers, gardeners, and agricultural professionals aiming for healthy, productive crops. In this comprehensive review, we explore the major diseases affecting vegetables, dissect their causative agents, symptoms, and management strategies, and offer insights into integrated disease management practices.

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6 Understanding Vegetable Diseases: An Overview Vegetable diseases are primarily

caused by pathogenic organisms—fungi, bacteria, viruses, nematodes, and sometimes parasitic plants. These pathogens invade plant tissues, disrupting normal physiological functions, and often lead to visible symptoms such as wilting, discoloration, lesions, and deformities. The impact of these diseases extends beyond individual plants to entire fields, especially when conditions favor pathogen proliferation. Factors influencing disease development include environmental conditions (humidity, temperature, soil type), cultural practices, and genetic susceptibility. --- Major Categories of Vegetable Diseases To systematically approach disease identification and management, it's helpful to categorize vegetable diseases based on their causative agents: Fungal Diseases Fungal pathogens are the most common cause of vegetable diseases. They thrive in moist, warm environments and can spread rapidly through spores, soil, tools, and infected plant material. Common Fungal Diseases: - Powdery Mildew: Affects cucurbits, cucumbers, and zucchinis, characterized by white powdery growth on leaves. - Downy Mildew: Seen in spinach, lettuce, and brassicas; causes yellowish or pale areas with fuzzy growth on the underside of leaves. - Early Blight and Late Blight: Potatoes and tomatoes are highly susceptible; symptoms include concentric rings on leaves and dark lesions. - Fusarium Wilt: A soil-borne disease affecting tomatoes, peppers, and eggplants; causes yellowing and wilting. - Gray Mold (*Botrytis*): Affects strawberries, lettuce, and other vegetables, leading to fuzzy gray growth and rot. Bacterial Diseases Bacterial pathogens often cause water-soaked lesions, wilting, and rot. They spread via water, contaminated tools, insects, and infected seeds. Common Bacterial Diseases: - Bacterial Wilt: Caused by *Ralstonia solanacearum*; results in sudden wilting and plant death. - Bacterial Leaf Spot: Seen in tomatoes, peppers, and lettuce; causes spots with yellow halos. - Fire Blight: Affects apples and pears but can sometimes impact related vegetables like pears used as edible ornamentals. - Angular Leaf Spot: Affects beans and other legumes, causing angular, water-soaked spots. Viral Diseases Viruses are notorious for causing stunted growth, mottling, and deformities. They are Diseases Of Vegetables 7 transmitted mainly through vectors like aphids, whiteflies, or contaminated tools. Common Viral Diseases: - Tomato Mosaic Virus: Causes mottled, distorted leaves and fruit. - Cucumber Mosaic Virus: Leads to mosaic patterns, leaf curling, and stunted growth. - Potato Virus Y: Affects tomatoes and potatoes, causing yellowing and reduced yield. - Squash Mosaic Virus: Results in mottled leaves and poor fruit development. Nematode Diseases Microscopic roundworms infiltrate roots, leading to galls, stunted growth, and reduced nutrient uptake. Common Nematode Diseases: - Root-Knot Nematodes (*Meloidogyne* spp.): Cause characteristic galls on roots, impairing water and nutrient absorption. - Lesion Nematodes: Create lesions in roots, leading to secondary infections. Other Diseases and Conditions - Parasitic Plants: Such as dodder, which parasitize vegetables and weaken them. - Physiological Disorders: Nutrient deficiencies,

sunscauld, and frost damage can mimic disease symptoms but are not caused by pathogens. -

-- In-Depth Analysis of Key Vegetable Diseases This section delves into some of the most impactful and widespread vegetable diseases, providing detailed insight into their symptoms, causes, and control measures.

Powdery Mildew Causative Agent: Fungal pathogens such as *Erysiphe cichoracearum* and *Leveillula taurica*. Symptoms: White to grayish powdery growth on upper leaf surfaces, stems, and sometimes fruits. Leaves may curl, yellow, and drop prematurely. Impact: Reduces photosynthesis, leading to stunted growth and lower yields. Management Strategies: - Use resistant cultivars. - Ensure proper spacing for air circulation. - Apply sulfur fungicides or natural remedies like neem oil. - Remove and destroy infected plant debris.

Early and Late Blight of Tomato Causative Agents: *Phytophthora infestans* (late blight) and *Alternaria solani* (early blight). Symptoms: - Early blight: Dark concentric spots on older leaves. - Late blight: Water-soaked lesions that rapidly turn necrotic, causing leaf and stem death. Impact: Severe outbreaks can wipe out entire tomato crops. Management Strategies: - Crop rotation and sanitation. - Use resistant varieties. - Apply approved fungicides at early signs of disease. - Avoid overhead watering to reduce leaf moisture.

Diseases Of Vegetables 8 Fusarium Wilt Causative Agent: *Fusarium oxysporum* f.sp. *lycopersici*. Symptoms: Yellowing of leaves, wilting despite adequate watering, and brown vascular tissue in stems. Impact: Can persist in soil for years, causing chronic productivity issues. Management Strategies: - Use resistant varieties. - Practice crop rotation with non-host crops. - Improve soil drainage. - Solarize soil before planting.

Root-Knot Nematodes Causative Agent: *Meloidogyne* spp. Symptoms: Root galls, stunted growth, yellowing, and reduced fruit set. Impact: Significantly reduces crop quality and yield. Management Strategies: - Use nematode-resistant cultivars. - Solarize soil to reduce nematode populations. - Apply organic amendments like neem cake. - Implement crop rotation with non-host crops.

--- Integrated Disease Management (IDM): Best Practices for Healthy Vegetables Effective control of vegetable diseases requires a holistic approach combining cultural, biological, chemical, and genetic strategies.

Cultural Practices - **Crop Rotation:** Avoid planting susceptible species in the same soil repeatedly. - **Sanitation:** Remove and destroy infected plant debris and weeds. - **Proper Spacing:** Ensures good air circulation and reduces humidity. - **Water Management:** Avoid overhead irrigation; water early in the day to promote drying. - **Soil Health:** Maintain balanced fertility, proper pH, and organic matter.

Biological Control - Use beneficial organisms such as *Trichoderma* spp. to suppress fungal pathogens. - Introduce predatory insects or parasitoids to control vector populations transmitting viruses. - Employ biopesticides based on microbial agents.

Chemical Control - Use fungicides, bactericides, and insecticides judiciously, following label instructions. - Rotate chemical classes to prevent resistance development. - Apply prophylactic

treatments before disease onset, especially in high-risk conditions. Diseases Of Vegetables

9 Resistant Varieties and Breeding - Select cultivars with known resistance to prevalent diseases. - Support breeding programs aimed at developing disease-tolerant vegetables. ---

Monitoring and Early Detection Regular scouting is vital for early disease detection. Use diagnostic tools such as: - Visual symptom identification. - Laboratory testing (ELISA, PCR) for viruses. - Soil testing for nematodes. Early intervention can prevent widespread outbreaks and reduce the need for chemical controls. --- Conclusion: The Path to Healthy Vegetable Crops Vegetable diseases pose a persistent challenge to growers worldwide, but with a comprehensive understanding of their nature and effective management strategies, losses can be minimized. Prevention remains the most economical and sustainable approach—integrating resistant varieties, cultural practices, biological control, and judicious chemical use. By staying vigilant, adopting integrated disease management practices, and fostering ongoing research into disease-resistant cultivars, farmers and gardeners can ensure robust, healthy vegetable crops that provide abundant harvests and contribute to food security. In essence, understanding diseases of vegetables is not just about diagnosis—it's about proactive stewardship of your crops, ensuring they remain resilient in the face of microbial threats. vegetable diseases, plant pathogens, pest management, fungal infections, bacterial infections, viral diseases, crop protection, plant health, disease diagnosis, organic control

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vegetable diseases focuses primarily on diseases that are caused by pathogens chapters dealing with the general principles of the causes diagnosis and control of vegetable crop diseases are followed by crop based chapters each disease entry includes a brief introduction to the disease detailed description of disease symptoms information on the pathogen and disease development and suggestions on how to manage the problem top quality color photos illustrate the book throughout this book will be useful to a range of professionals including research and extension plant pathologists diagnosticians and plant lab personnel teachers of agriculture and related subjects university students in agriculture and related fields commercial farmers vegetable producers and farm managers agriculturalists in the fields of seed production vegetable breeding agrichemicals pest control marketing and other subjects government and regulatory persons dealing with agriculture serious gardeners and hobbyists crop based organisation for easy diagnosis high quality color photos 444 color illustrations 5 tables

a diagnostic guide and a key reference for diseases affecting vegetable crops in australia the text is supported by over 190 pages of colour plates

the book entitled disease problems in vegetable production 2nd edition is specifically prepared for under and post graduate students in agriculture horticulture and range of professionals including teachers researchers extension plant pathologists and elite vegetable growers the book gives a comprehensive over view of economic importance symptomatology etiology pre disposing factors and management of vegetable diseases employing cultural biological host resistance plant extracts and chemical methods as such and in an integrated approach so that the ravages due to the diseases remain below economic threshold level a total of 19 chapters dealing with important diseases of vegetables like potato tomato crucifers cucurbits pea french bean chillies and bell pepper

onion garlic eggplant carrot sugar beet colocasia okra and leafy vegetables have been compiled in this book two new chapters on diseases of ginger and diseases of vegetables under protected cultivation as well as some important diseases of different vegetable crops left out in the first edition have been added in this edition besides the book also includes chapters on common pathogens of vegetable crops disease problems in nurseries post harvest diseases and diseases caused by nematodes all chapters have been updated in the light of available literature up to 2017 symptoms disease cycles of important diseases and different structures of pathogens have also been given in the book that will not only help in better diagnosis and understanding of the perpetuation and spread of the causal pathogens but will also help in the management of these diseases more effectively coloured photographs of disease symptoms have also been included for easy identification of vegetable diseases

describes the diseases of important vegetable crops and tells how to control them covers all disease types bacterial fungal viral nematode and abiotic and provides information on their cycles describes control measures including resistant varieties fungicides crop rotation and seed treatments well illustrated and readable completely revised from first edition

excerpt from handbook of the diseases of vegetables occurring under market storage and transit conditions this handbook is designed primarily to aid the inspectors of the bureau of markets in the detection and identification of plant diseases as they occur in vegetables under transit storage and market conditions the entire inspection service and the survey and study of vegetable crop diseases under transit and market conditions were begun but little more than a year ago consequently this handbook an outgrowth of that survey and study is necessarily incomplete the text and illustrations are the property of the united states department of agriculture and are not to be used in any published form whatsoever the description of the signs symptoms or effects of each plant disease is followed by a statement of the geographic distribution and the seasonal or climatic relations of the disease so far as they are known since some diseases occur only in certain districts and often only under certain conditions a statement is made as to the time and place of inception development and spread of the disease this is especially important from a market point of view for example in placing the responsibility for the poor condition of a shipment caused by bacteria or fungi it is essential to bear in mind that some diseases are field infections and do not develop nor spread in transit or storage that others are field infections which develop or progress but do not spread in transit or storage that others are field infections which develop and spread under transit and storage conditions and finally that a number are transit and storage infections of stock perfectly sound when harvested

it is fully realized that at present not all decay can be referred to clearly defined causes about the publisher forgotten books publishes hundreds of thousands of rare and classic books find more at forgottenbooks.com this book is a reproduction of an important historical work forgotten books uses state of the art technology to digitally reconstruct the work preserving the original format whilst repairing imperfections present in the aged copy in rare cases an imperfection in the original such as a blemish or missing page may be replicated in our edition we do however repair the vast majority of imperfections successfully any imperfections that remain are intentionally left to preserve the state of such historical works

this book explains how to identify and manage the major field and postharvest diseases affecting 18 vegetable crops each disease of each crop is illustrated with colour photographs the text describes the symptoms of each disease its importance the means of infection and spread and control measures back cover

diseases of fruits and vegetable crops recent management approaches covers certain basic aspects of knowledge on diagnostic symptoms modes of perpetuation and dissemination of pathogens favorable conditions for disease development and the latest management strategies for disease prevention and mitigation in vegetable crops fruit crops and plantation crops with chapters written by experts working on specific fruit and vegetables disease the volume covers many vegetable and fruit crops including pineapples grapes apples guava litchi potatoes peas beans ginger and turmeric and many more each chapter reviews the specific diseases relevant to the crop and their management and includes recent research findings the information presented here will be valuable for plant protection officers district horticulture officers and other government personnel in the directorates and agencies of agriculture horticulture and plant protection as well as plant protection experts vegetable specialists and others

vegetables are important source of dietary fibers minerals antioxidants and vitamins shifting from a non vegetarian diet to vegetarian global recognition of the importance of vegetables for human health and their medicinal and nutritional value have contributed to a steady upward trend in vegetable production system china is ranked first in the world and currently produces around 237 million tons of vegetable the total vegetable production of india during the year 2009 10 was approximately 90 million tons pesticides are valuable tools in sustainable vegetable production but unfortunately they are often being used irresponsibly causing hazards to producers consumers and the environment in addition they can exacerbate pests and diseases problems by inducing resistance and suppressing the natural enemies which exert natural biological control this book aims to

promoting an integration of appropriate chemical cultural physical genetic and biological technologies into integrated pest management ipm strategies for vegetable crop protection

among the horticultural crops fruits and vegetables fv are of primary portance as the key source of essential components in an adequate and balanced human diet fv have supported largely the daily food requirement of mankind since ages and even before man learned to grow cereal crops systematically over the years growing fv has been the mainstay of rural economy and has emerged as an indispensable part of agriculture world over offering farmers a wide range of crops in varied topography and climate in certain parts of the world fv are the major dietary staple apart from being a rich source of vitamins and minerals this sector also contributes significantly in economy of the region or the nation the increased income from per unit area of fv is far ahead and can not be compared with that of cereal crops a recent survey by the economist revealed that the world population has creased by 90 in the past 40 years while food production has increased only by 25 per head with an additional 1 5 billion mouth to feed by 2020 farmers worldwide have to produce 39 more looking at the load of the future food requirement the global increased production of fv during last few years has absorbed the additional food requirement and accordingly the eating habits are also changing and shifting wards more consumption of these commodities worldwide

vegetable crop diseases and their solutions provides comprehensive information on diagnosing and managing diseases in vegetable crops we cover the major diseases that can affect crops like tomatoes potatoes carrots brassica and beans including their symptoms pathogens and effective treatments understanding the causes of plant diseases whether living or non living is crucial for protecting crops and ensuring high yields our book offers detailed knowledge of the science behind diagnosing and treating vegetable diseases making it easier for growers to identify and manage issues in their gardens we also discuss the role and use of fertilizers in maintaining healthy crops each chapter is designed to provide clear and concise information making it an essential guide for anyone interested in vegetable farming with self assessment sections to reinforce learning and a glossary to aid understanding this book ensures readers gain a thorough understanding of crop disease management

our dependence on healthy vegetable crops as a reliable source of food transcends all barriers of nation and culture consumers now demand excellent quality from the industry that produces large volumes of high quality vegetables to be sold locally regionally and shipped internationally the diseases that affect vegetables compromise such quality

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the book entitled diseases of vegetable ornamental and spice crops is specifically prepared for under graduate and post graduate students in agriculture horticulture and a range of professionals including teachers researchers extension plant pathologists and commercial farmers this book contains a total of twenty five chapters dealing with important diseases of vegetables ornamentals and spices each disease entry includes a brief introduction to the disease detailed description of disease symptoms information on the pathogen and disease development and strategies for disease management disease cycles of important diseases have also been drawn which will help in understanding the perpetuation and

spread of the pathogens coloured photographs of disease symptoms have been included for easy identification of different diseases

knowledge of vegetable crops diseases is several thousand years old and it is not known exactly when man come to know realise their prevalence the damage caused by diseases of vegetable crops have affected man all through the ages besides the recurrence of rusts and mildews of vegetable crops of disease which caused large scale of death and famine the book has been divided into 18 chapters the various chapters have been written by persons in the long experience in the area of specialisation the chapter 1 deals with field diseases of banana and lima beans chapter 2 related to roots rots wilt and blights of peas chapters 3 5 deal with blights and other ills of celery the important diseases of lettuce cauliflower cabbage and others chapter 6 described the hazards to onions in many areas the chapter 9 11 describes the preventing the diseases of peanuts ways to combat disorders in the south the chapter 12 to 17 dealing with diseases of peppers beets carrots spinach mushroom cucumbers melons and squash the chapter 18 is unique and is related to developing healthier vegetables this book shall be of great help to the researchers teachers and students in the field of plant pathology contents chapter 1 field diseases of beans and lima beans by w j zaumeyer h rex thomas chapter 2 root rots wilts and blights of peas by w t schroeder chapter 3 blights and other ills of celery by a g newhall chapter 4 the important diseases of lettuce by guy weston bohn chapter 5 cauliflower cabbage and others by j c walker chapter 6 hazards to onions in many areas by j c walker chapter 7 control of diseases of potatoes by eugene s schultz chapter 8 the fungi that cause cause rot in sweetpotatoes by harold t cook chapter 9 preventing the diseases of peanuts by coyt wilson chapter 10 ways to combat disorders of tomatoes by s p doolittle chapter 11 transplants grown in the south by huey i border chapter 12 diseases of peppers by s p dolittle chapter 13 diseases of beets by glenn s pound chapter 14 diseases of carrots by glenn s pound chapter 15 diseases of spinach by glenn s pound chapter 16 diseases of the common mushroom by edmund b lamber theodore t ayers chapter 17 cucumbers melons squash by john t middleton guy weston bohn chapter 18 developing healthier vegetables by h rex thomas w j zaumeyer

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