

PATHOLOGY

Historical perspectives of plant diseases

Concept of tree disease: symbiosis concept, disease triangle, disease square, parasitism and pathogenicity, classification of plant and tree diseases, Climatic, chemical and edaphic causes of diseases

Biotic Causes of Disease: Fungi, bacteria, phytoplasma, viruses, parasitic flowering plants, nematodes, insects, allelopathy, multiple pathogen complexes, disease Cycle

Inoculum, inoculation and penetration interactions

Colonization and Pathogenesis: Local / systematic invasion, destructive / balanced parasitism, biochemistry of infection, systemic acquired resistance.

Pathological problems in urban trees and plantations

Epidemiology: Environmental factors and cultural practices, geophytopathology, quantitative analysis, forecasting and hazard evaluation, monocyclic and polycyclic diseases

Principles of Disease Management: Detection, damage appraisal, cultural, chemical and biological control. Plant quarantine with special reference to forestry species and timber import / export, Integrated Forest Disease Management

Forest nursery diseases: Seed pathology, damping off, charcoal rot, web blight, wilt, foliar blight, mildews and rust disease, nematode diseases

Root Diseases: Diagnosis, root-infecting and soil-inhabiting organisms, rhizosphere ecology and disease management. Ganoderma root rot, Polyporus root rot of sal, root and butt rot of deodar, Armillaria root disease

Mycorrhizae: Ecosystematic functions, economic importance. Host plants, morphology. classification, function. protection. Formation, ectomycorrhizae and endomycorrhizae

Stem Pathology and wood decay: Systemic Diseases, Dieback and Declines. Mistletoes. Wood Decay, heart rot of sal. khair. Blue pine and teak. Swertia-pine felt rust, Shisham, oak and Casuarina wilt, Ceratocystis canker, pink disease, sanal spike disease, chestnut blight, hypoxylon canker, diffuse cankers, pine wood nematode, sap stain, brown rot and white rot

Molecular tools in forest pathology: Identifying resistant host germplasm, molecular variability in pathogen isolates, fungal barcode region, designing species specific primers, molecular markers.