

Course no. - PATH - 365(New)

Credit - 3(2+1)

Course title - Diseases of Field and Horticultural crops and their management - II

Sr. No.	Crop name	Disease name	Causal agent	P. I	S. I
A)	Field crops				
1.	Wheat	Rusts			
		a. Black/stem rust	<i>Puccinia graminis tritici</i>	Urediospores present in plant debris	Teliospores through air
		b. Brown/leaf rust	<i>Puccinia recondita</i>		
		c. Yellow/stripe rust	<i>Puccinia striiformis</i>		
		Loose smut	<i>Ustilago nuda</i>	Infected grains	Teliospores through wind
		Karnal bunt	<i>Neovossia indica</i>	Teliospores in plant infected seeds	Air borne sporidia
		Powdery mildew	<i>Bumeria graminis</i>	Dormant mycelium in plant debris	Wind borne conidia
		Alternaria blight	<i>Alternaria triticina</i>	Infected seeds, plant debris	Wind borne conidia
		Ear cockle	<i>Anguina tritici</i>	Infected seeds	Irrigation water
		Leaf blotch	<i>Septoria tritici</i>	Plant debris	Air borne conidia
2.	Sugarcane	Red rot	<i>Colletotrichum falcatum</i>	Infected sets	Irrigation water
		Whip smut	<i>Ustilago scitaminea</i>	Sclerotia present in contaminated seeds	Wind / rain splash
		Wilt	<i>Cephalosporium sacchari</i>	Soil and infected sets	Wind, rain and irrigation water
		Grassy shoot	MLO/Phytoplasma	Infected setts	Vector - Aphid
		Ratoon stunting	<i>Clavibacter xyli</i>	Infected setts	Harvesting implements
		Pokka boeng	<i>Fusarium moniliformae</i> f. sp. <i>xyli</i>	Chlamydospores from infected plant debris	Ascospores through air
B)	Oil seed crops				
3.	Sunflower	Sclerotinia stem rot	<i>Sclerotium rolfsii</i>	Sclerotia or plant debris	Irrigation water, farm implements
		Alternaria blight	<i>Alternaria helianthi</i>	Infected seeds, plant debris & weed hosts	Wind borne conidia

		Rust	<i>Puccinia helianthi</i>	Urediospores present in plant debris	Teliospores through air
		Downy mildew	<i>Plasmopara halstidii</i>	Oospores in soil	Wind borne sporangia and zoospores
		Mosaic	<i>Sunflower mosaic virus</i>	Virus particles in infected seeds	Vector - White fly (<i>Bemisia tabaci</i>)
		Necrosis	<i>Sunflower necrosis virus/ Tobacco streak virus</i>	Sap transmissible	Vector - Thrips (<i>Thrips tabaci</i>)
		Powdery mildew	<i>Erysiphae cichoracearum</i>	Ascospores in plant debris	Wind borne conidia
4.	Mustard	Alternaria blight	<i>Alternaria brassicae</i>	Infected plant debris	Air borne conidia
		White rust	<i>Albugo candida</i>	Oospores in plant debris	Zoospores & sporangia
		Downy mildew	<i>Perenospora parasitica</i>	Oospores in plant debris	Zoospores & sporangia
		Sclerotinia stem rot	<i>Sclerotinia sclerotium</i>	Sclerotial bodies as seed contaminants & in soil	Irrigation water & farm implements
C)	Pulses				
5.	Gram	Wilt	<i>Fusarium oxysporum f. sp.ciceri</i>	Chlamydospores in soil	Irrigation water & farm implements
		Grey mould	<i>Botrytis cinera</i>	Sclerotial bodies as seed contaminants	Air borne spores
		Ascochyta blight	<i>Ascochyta rabici</i>	Pycnidia present in plant debris	Air borne conidia
		Stem rot or root rot	<i>Rhizoctonia bataticola</i>	Sclerotial bodies as seed contaminants & in soil	Irrigation water & farm implements
		Stunt disease	Chick pea stunt virus	Infected plants	Vector - Aphid (<i>A.craccivora</i>)
6.	Pea	Downy mildew	<i>Perenospora vicae</i>	Oospores in plant debris	Zoospores & sporangia
		Powdery mildew	<i>Erysiphae pisi</i>	Dormant mycelium & Pycnidia in infected plant debris	Wind borne conidia

		Rust	<i>Uromyces rabae</i>	Urediospores present in plant debris	Teliospores through air
		Wilt	<i>Fusarium oxysporum</i> f..sp <i>psi.</i>	Chlamydo­spores in soil	Irrigation water & farm implements
7.	Lentil	Rust	<i>Uromyces fabae</i>	Urediospores present in plant debris	Teliospores through air
		Wilt	<i>Fusarium oxysporum</i>	Chlamydo­spores in soil	Irrigation water & farm implements
8.	Linseed	Rust	<i>Melampsora lini</i>	Urediospores present in plant debris	Teliospores through air
		Alternaria bud blight	<i>Alternaria lini</i>	Infected plant debris	Air borne conidia
		Powdery mildew	<i>Oidium lini</i>	Dormant mycelium & Pycnidia in infected plant debris	Wind borne conidia
		<i>Cercospora</i> leaf blight	<i>Cercospora gossypina</i>	Infected plant debris	Air borne conidia
		<i>Alternaria</i> leaf spot	<i>Alternaria melampsora</i>	Infected plant debris	Air borne conidia
		<i>Verticilium</i> wilt	<i>Verticilium dahliae</i>	Sclerotia & dormant mycelium	Air borne conidia
D)	Cash crop				
9.	Cotton	Root rot	<i>Rhizoctonia bataticola</i>	Sclerotial bodies as seed contaminants & in soil	Irrigation water & farm implements
		Vascular wilt	<i>Fusarium oxysporum</i> f.sp. <i>vasinfectum</i>	Chlamydo­spores in soil	Irrigation water & farm implements
		Anthracnose	<i>Colletotrichum capsici</i>	Infected plant debris	Air borne conidia
		Black arm/Angular leaf spot	<i>Xanthomonas axonopodis</i> pv. <i>malvacearum</i>	Bacterial cells in infected seeds	Wind & rain splash
		Dahiya disease/ Grey mildew	<i>Mycospharella areola</i>	Infected plant debris	Air borne conidia
		Leaf curl	Cotton leaf curl virus	On alternate host	Vector - White fly (<i>B. tabaci</i>)

		2-4-D Injury	Post emergence application of 2, 4 -D herbicide	-	-
		Redening/lalya	Mg deficiency	-	-
		Rust	<i>Phakospora gossypii</i>	Urediospores present in plant debris	Teliospores through air
		<i>Helminthosporium</i> leaf spot	<i>Helminthosporium gossypii</i>	Infected seeds	Air borne conidia
		Boll rot	<i>Fusarium moniliformae</i>	Infected bolls	Rain splashes, insects
		Leaf spot	<i>Alternaria macrospora</i>	Infected plant debris	Air borne conidia
E)	Horticultural crops				
10.	Mango	Die back	<i>Botrioshaeria rhodina</i>	Infected plant debris	Air borne conidia
		Anthracnose	<i>Colletotrichum gleosporioides</i>	Infected plant debris	Air borne conidia
		Mango-malformation	<i>Fusarium moniliformae</i>	Chlamydospores in soil	Wind borne & Mite disseminated micro and macro conidia
		Bacterial blight	<i>Pseudomonas syringae</i>	Infected plant debris	Bacterial cells through rain splashes
		Powdery mildew	<i>Oidium mangiferae</i>	Dormant mycelium & Pycnidia in infected plant debris	Wind borne conidia
		Spongy tissue	Post harvest physiological disorder	-	-
		Red rust (algal disease)	<i>Cephaleurus virescens</i>	Algal filaments & sporangia in infected plant debris	Rain splash sporangia & zoospores
		Pink diseases	<i>Corticium salmonicolor</i>	Dormant mycelium in bark, stem	Conidia through rain splashes
		Loranthus or giant mistletoes	<i>Loranthus</i> sp.	Seeds disseminated by birds on the stem of host plant	
		Stone graft mortality	<i>Fusarium oxysporum</i>	Chlamydospores in soil	Irrigation water & farm implements

		Lime induced chlorosis	Lime deficiency	-	-
		Sooty mould	<i>Capnodium ramosum</i>	Dormant mycelium in plant debris	Wind borne conidia
11.	Citrus	Gummosis	<i>Phytophthora sp. (P. palmivora, P. citrophthora, P. asiaticus, P. nicotianae, P. parasitica, P. syringe)</i>	Oospores & dormant mycelium in infected stem and plant parts	Sporangia & zoospores by rain splash and irrigation water
		Citrus canker	<i>Xanthomonas oxanopodis</i> pv. <i>Citri</i>	Bacterial cells in infected plant parts	Autonomous dispersal through infected seedlings
		Fruit rot	<i>Alternaria citri</i>	Infected plant debris	Air borne conidia
		Citrus greening	<i>Liberibacter asiaticus</i>	Bacterial cells through bud woods & grafts	Vector - Citrus Psylla (<i>Diaphorina citri</i>)
		Anthracnose	<i>Colletotrichum gloeosporioides</i>	Infected plant debris	Air borne conidia
		Tristeza	<i>Citrus tristeza virus</i>	Infected bud woods & grafts	Vector - Aphid (<i>Toxoptera citricida</i>)
		Citrus exocortis	Viroid (infectious entity smaller than virus, consist only nucleic acid without protein coat)	Infected bud woods & grafts	Vector - sap sucking insects
		Scab of citrus	<i>Elsinoe fawceti</i>	Infected plant parts	Rain splash & wind borne conidia
		Mottle leaf of citrus	Zinc deficiency	-	-
	Dry root rot	<i>Fusarium solani</i>	Chlamydospores in soil	Irrigation water & farm implements	
12.	Grape vine	Downy mildew	<i>Plasmopara viticola</i>	Oospores in plant debris	Zoospores & sporangia
		Powdery mildew	<i>Uncinula necator</i>	Dormant mycelium & Pycnidia in infected plant	Wind borne conidia

				debris	
		Anthracnose/ bird eye spot	<i>Elsinoe ampelina</i>	Infected plant debris	Air borne conidia
		Bacterial canker	<i>Pseudomonas viticola</i>	Bacterial cells in infected plant parts	Autonomous dispersal through infected seedlings
		Grapevine fan-leaf	Grapevine fan leaf virus	Virus present in planting materials	Vector - Nematode (<i>Xiphenema index</i>)
		<i>Alternaria</i> leaf spot	<i>Alternaria vitis</i>	Infected plant debris	Wind borne conidia
		Rust	<i>Phakospora ewitis</i>	Teliospores in plant debris, aeciospores on alternate host	Wind borne spores
13.	Peach	Leaf curl	<i>Taphrina maculans</i>	Infected plant debris	Wind borne conidia
14.	Apple	Scab	<i>Venturia inaequalis</i>	Ascospores in infected leaves	Wind borne conidia
		Powdery mildew	<i>Podospharea leucotricha</i>	Dormant mycelium & pycnidia in infected plant debris	Wind borne conidia
		Fire blight	<i>Erwinia amylovora</i>	Bacterial cells in buds and woody tissues	Vector - bees, flies and ants
		Crown gall	<i>Agrobacterium tumefaciens</i>	Bacteria enters through injury	Irrigation water, farm implements
		Mosaic	Apple mosaic virus		
14.	Strawberry	Leaf spot	<i>Mycosphaella fragariae</i>	Infected plant debris	Air borne conidia
F)	Vegetables				
15.	Potato	Early blight	<i>Alternaria solani</i>	Infected plant debris	Wind borne conidia
		Late blight	<i>Phytophthora infestans</i>	Oospores in soil	Wind borne sporangia & zoospores
		Black scurf/Stem canker	<i>Rhizoctonia solani</i>	Sclerotia present in soil	Mycelium through irrigation water & farm implements

		Leaf roll	Potato leaf roll virus	Virus particles in infected tubers	Vector - Aphid (<i>Myzus persicae</i>)
		Mosaic	Potato virus X & Y	Virus particles in infected tubers	Mechanically through farm implements
		Potato scab	<i>Streptomyces scabies</i>	Dormant mycelium in seed tubers & in soil	Rain splash & irrigation water
		Soft rot	<i>Erwinia carotovaora</i>	Bacterial cells in infected tubers	Irrigation water
		Brown rot	<i>Ralstonia solanacearum</i>	Bacterial cells in infected tubers	Irrigation water
		Potato spindle tuber	Viroid (pstd)	Virus particles in infected tubers	Transmitted by pollen and beetles, bubs
		Black heart	Oxygen deficiency & High temp. during field and storage	-	-
16.	Cucurbits	Downy mildew	<i>Pseudoperenospora cubensis</i>	Oospores in soil	Wind borne sporangia and zoospores
		Powdery mildew	<i>Erysiphe cichoracearum</i>	Dormant mycelium & pycnidia in infected plant debris	Wind borne conidia
		Wilt	<i>Fusarium oxysporium f.sp.cubens</i>	Chlamydo spores in soil	Irrigation water & farm implements
		Angular leaf spot	<i>Pseudomonas syringae</i>	Bacterial cells in infected seeds	Wind & rain splash
		Mosaic	<i>Cucumber mosaic virus</i>	Virus particles on weed & collateral hosts	Vector - Aphid (<i>A. craccivora</i>) & beetles
		Tospo	<i>Tospo virus</i>	On alternate host Watermelon, pumkin, cucumber	Vector - Thrips (<i>Thrips tabaci</i>)
		Cercospora leaf spot	<i>Cercospora citrulina</i>	Dormant mycelium in infected plant debris	Wind borne conidia
17.	Onion	Purple blotch	<i>Alternaria porri</i>	Infected plant debris	Air borne conidia
		Stemphylium	<i>Stemphylium</i>	Infected plant	Air borne conidia

		blight	<i>vesicarium</i>	debris	
		Downy mildew	<i>Perenospora destructor</i>	Oospores in plant debris	Zoospores & sporangia
		Smut	<i>Uromyces cepulae</i>	Spore bolls in soil & seed bulbs	Wind & irrigation water
		Smudge	<i>Colletotrichum cercinans</i>	Infected plant debris	Air borne conidia
		Erwinia rot	<i>Erwinia carotovara</i>	Infected plant debris	Irrigation water, rain splash
18.	Garlic	Neck and bulb rot	<i>Botritis alli</i>	Sclerotial bodies as seed contaminants	Air borne spores
		Stemphylium blight	<i>Stemphylium vesicolor</i>	Infected plant debris	Air borne conidia
		Blemish			
		Black mould	<i>Aspergillus niger</i>	Infected seed scales	Air, water borne conidia
19.	Chilli	Anthracnose and fruit rot	<i>Colletotrichum capsici</i>	Infected plant debris	Air borne conidia
		Wilt	<i>Fusarium oxysporum</i>	Chlamydo spores in soil	Irrigation water & farm implements
		Leaf curl	<i>Gemini virus</i>	Infested plants & alternate hosts	Vector - White fly
		Powdery mildew	<i>Levellula taurica</i>	Dormant mycelium & pycnidia in infected plant debris	Wind borne conidia
		Damping off	<i>Pythium aphanedermatum</i>	Oospores in soil	Irrigation water & farm implements
		Wet rot	<i>Choanophora cucurbitarum</i>	Zoospores in seed & crop debris	Irrigation water
		Mosaic complex	Cucumber Mosaic Virus & Tobacco Mosaic Virus	Externally seed borne	Mechanically
		Cercospora leaf spot	<i>Cercospora capsici</i>	Dormant mycelium in plant parts	Wind borne conidia
		Bacterial leaf spot	<i>X. compestris pv. versicola</i>	Infested seeds	Rain splash
20.	Coriander	Stem gall	<i>Protomyces macrosporus</i>	Ascospores & Chlamydo spores in soil	Irrigation water & farm implements
		Powdery mildew	<i>Erysiphae polygoni</i>	Dormant mycelium & Pycnidia in infected plant	Wind borne conidia

				debris	
		Wilt	<i>Fusarium oxysporum</i>	Chlamydo spores in soil	Irrigation water & farm implements
21.	Turmeric	Leaf spot	<i>Colletotrichum capsici</i>	Infected plant debris	Air borne conidia
G)	Ornamental crops				
22.	Marigold	Botrytis blight	<i>Botrytis cinera</i>	Sclerotial bodies in soil	Irrigation water & farm implements
		Alternaria blight	<i>Alternaria tagetica</i>	Infected plant debris	Air borne conidia
		Powdery mildew	<i>Levellula taurica</i>	Dormant mycelium & pycnidia in infected plant debris	Wind borne conidia
23.	Rose	Dieback	<i>Botryodoplotia theobromae</i>	Pycnidia on diseased twigs	Wind borne conidia
		Powdery mildew	<i>Sphacelotheca pannosa var. rosae</i>	Dormant mycelium & Pycnidia in infected plant debris	Wind borne conidia
		Black leaf spot	<i>Diplocarpon rosae</i>	Infected plant debris	Air borne conidia
		Crown gall	<i>Agrobacterium tumefaciens</i>	Infected soil & plant debris	Irrigation water & Rain splashes
		Rust	<i>Phragmidium mucronatum</i>	Urediospores present in plant debris	Teliospores through air
		Alternaria leaf blight	<i>Alternaria alternata</i>	Infected plant debris	Air borne conidia

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