

IDENTIFICATION OF IMPORTANT DISEASES OF FRUIT CROPS

Exercise

Identification of important diseases of fruit crops.

Objectives

- To identify important diseases of fruit crops

Delivery schedule: 01 period

Student expectations / learning objectives

- To know the important diseases of fruit crops
- To identify the diseases affected in major fruit crops
- To learn how these diseases may cause losses to the fruit crops.

Handouts / material / equipment's & tools required: Paper sheet and pen to note down the different diseases and to collect few specimens from field and to note down some of the important features of the particular diseases.

Pre-learning required: Pre-requisite knowledge of diseases that affect fruit crops and their symptoms.

Introduction

The term 'DISEASE' is coined by combining the words DIS + EASE = DISEASE. The prefix DIS means negative, reverse, or opposite, and the word EASE means comfort, or freedom from pain or discomfort. DISEASE therefore means not well, and the cause can be many. Disease can be defined as a harmful deviation from normal functioning of the physiological processes caused by an infectious agent. However, a harmful deviation caused by a non-infectious agent, For example, herbicide or nutrient deficiency, is a disorder. In the case of plant diseases, the causal agent may be a fungus, virus, bacterium or a parasitic plant. The study of plant diseases are important as they cause loss to the produce. Hence, the diseases are required to be prevented and controlled to avoid loss of valuable food.

The diseases can be classified into following three types on the basis their occurrence and severity.

- 1) **Endemic diseases:** Endemic means prevalent in and confined to a particular locality. These diseases are more or less constantly present in a particular area. Examples, Moko diseases of Banana
- 2) **Epidemic diseases:** These diseases occur incidentally and occasionally in a particular locality. The word epiphytotic is used particularly for plant diseases instead of epidemic. Examples, European stone fruits yellow in stone fruit species
- 3) **Sporadic diseases:** These occur at very irregular intervals and locations. Examples, Dry root rot of citrus

Classification of plant diseases on the basis of modes of their spreading:



- 1) **Soil borne diseases:** Inoculum of the diseases causing pathogen remains in soil and penetrate the plant resulting in diseased condition. Examples, Guava wilt and pomegranate wilt.
- 2) **Seed borne diseases:** The microorganisms are carried along with seeds and cause diseases when congenial condition occurs. Examples, Cherry yellows in stone fruits
- 3) **Air borne diseases:** The micro-organisms are spread through air and attack the plants causing diseases. Examples, blight in mango, rust in aonla, powdery mildew in ber
- 4) **Diseases spread by insects:** The viral diseases are spread by insects. The insects which carry the viruses are known as vectors. Examples, Citrus tristeza decline, papaya leaf curl, papaya ring spot, Citrus greening

For teachers...

- Make students to understand the different types of diseases.
- Practically, show the students, different types of disease symptoms in each crop.
- Ask the students to collect some commonly available disease samples from the field.

In order to have management of these diseases, student should have the idea of the casual organism, crops affected and disease symptoms.

Major diseases of fruit crops

Fungal diseases - Leaves and inflorescence			
Disease	Pathogen	Crops	Symptoms
Powdery mildew	<i>Podosphaera</i> , <i>Sphaerotheca</i> , and <i>Uncinula</i> spp.	Apple, ber, grape, strawberry, cherry, mango, peach, plum	White powdery spore masses on leaves, shoots and inflorescence. Web-like russetting or discoloration of affected area.
			
Powdery mildew in apple		Powdery mildew on mango panicle	

Leaf spots or scabs	<i>Mycosphaarella</i> and <i>Venturia</i>	Apple, pear, peach, strawberry, citrus	Circular, angular or irregular blemishes or lesions on leaves. Spots often coalesce to form blotches if severe.
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Apple scab



Leaf spot on apple

Fungal diseases- Fruits

Disease	Pathogen	Crops	Symptoms
Brown rot	<i>Monilinia</i> sp.	Peach, apricot, plum, cherries, almond, quince	The blossom blight phase kills flowers at bloom; the fruit rot phase occurs within days of harvest. Brown, soft spots spread rapidly, producing powdery tan spores.



Brown rot in plum



Brown rot in peach

Anthracnose	<i>Colletotrichum</i> sp.	Avocado, banana, guava, mango, papaya,	Small to large, brown or black, sunken lesions on fruit surface near harvest; lesions may coalesce in badly infected fruit. Lesions usually dry and firm.
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Anthracnose in banana



Anthracnose in mango

Fungal diseases- Trunk, crown and roots

Disease	Pathagen	Crops	Symptoms
Root / crown rot	<i>Phytophthora</i>	Apple, citrus, papaya, pear, peach, apricot, cherry, plum, citrus	Poor shoot growth, chlorotic leaves and generally lack of vigor. Shoot dieback and tree collapse may occur after rainy periods.

Bacterial diseases

Disease	Pathagen	Crops	Symptoms
Bacterial canker	<i>Pseudomonas syringae</i>	Mango, peach, plum, apricot, cherry, almond, walnut, others	Irregular, sunken areas in bark; variable in size. Often with amber gum exuding from canker in spring. Tissue beneath cankers is discolored and often sour smelling. Twigs, limbs, or entire trees dieback, but tree sprouts from rootstock since roots are alive.
Fire blight	<i>Erwinia amylovora</i>	Pear, apple, quince	Browning or blackening and withering of flower clusters or current season's shoots. Shoots appear burned, and curl at tips into a "shepherd's crook" shape. Entire limbs and trees can be killed by girdling
Citrus canker	<i>Xanthomonas axonopodis</i>	Citrus fruits	Citrus canker have characteristic lesions on leaves, stems, and fruit with raised, brown, water-soaked margins, usually with a yellow halo or ring effect around the lesion. Older lesions have a corky appearance.


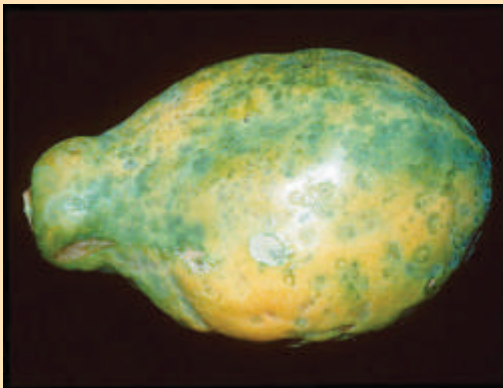



Fire blight



Citrus canker

Viral diseases			
Disease	Pathagen	Crops	Symptoms
Bunchy top	Banana bunchy top virus	Banana	Plants are extremely stunted, Leaves are reduced in size marginal chlorosis and curling. Leaves upright and become brittle. Many leaves are crowded at the top.
Papaya ring spot	Papaya ring spot virus	Papaya	Circular concentric rings are produced on the fruits. Margin and distal parts of leaves roll downward and inwards, mosaic mottling, dark green blisters, leaf distortion which result in shoe string system and stunting of plants.
Leaf curl	Papaya leaf curl virus	Papaya	Curling, crinkling and distortion of leaves, reduction of leaf lamina, rolling of leaf margins inward and downward, thickening of veins.

Banana bunchy top

Papaya ring spot

Papaya leaf curl

Students Activities

1. Visit to nearby orchards and try to collect samples of diseased plant and examine.
2. You can also note down the diseases in each crop around your locality.

Study Material

Sambamurty, A.V.S.S. (2006). A Textbook of Plant Pathology. IK International Publishers, New Delhi