

5. Mode of spread of pathogen:

Some are air born, some water born and some are soil born. The air born have more chance to cause the epidemic. The rust and leaf spot are air born and can travel from few km to many km and move quickly and have more chances to cause epidemic. The air born vectors (Aphids, whitefly, psyllid leaf hoppers) and in Dutch elm tree fungal disease spread by Beetles. Bacterial wilt of cucurbits and pine wilt by nematode are spread by beetle. Some are rain born (water born) i.e. scab and anthracnose. Some are soil born and spread by seed, tuber, vegetative parts, bulbs etc.

Lecture No. 15.

Evaluation of economic threshold

The foliar diseases that have the localized infections have 3 parameters to characterize them.

1. Disease incidence of individual plant
2. Disease incidence of individual organ.
3. Disease severity (%age of infected Area).

Lecture: Theory

3. Type of reproduction of Pathogen:

Most of fungi, Bacteria & viruses reproduce very fastly. Fungi & Bacteria Nematode have very large cycle.

(a) **Polycyclic**:- They produce many life cycle in single growing season e.g. rust, powdery mildew, downy mildew, leaf spot, soil fungi (verticillium) Nematode fusarium, 1-4 generations.

(b) **Monocyclic**:- They complete just one life cycle in 1 growing season e.g. smut, few rust.

(c) **Polyetic**:- They require more than 1 growing seasons to complete their life cycle e.g. cedar apple rust (2 year), white pine blister (3-6 year) (5-6 year)

4. Ecology of Pathogen:- (Mode of spread)

Pathogen produce spores over the surface of the plant so their spread is quick. Protozoa requires moisture. Virus lives in the carrier (vector). Bacteria requires the large time to spread so there are less chance of epidemic by bacteria.

Plant Pathology

PP-308

Practical Part

Rating Scale

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Powdery Mildew Scale

Score	Disease (%)	Reaction	Description of the symptom
0	0	Immune (I)	Leaves free from infection
1	<1	Highly resistant (HR)	Small powdery mildew spots covering <1% leaf area
3	1-10	Resistant (R)	Small powdery lesion covering 1%-10% of the leaf area
5	11-25	Moderately resistant (MR)	Powdery mildew lesions enlarging, covering 11%-25% of the leaf area
7	26-50	Moderately susceptible (MS)	Lesions coalesce forming big patches covering 26%-50% of the leaf area
9	51-70	Susceptible (S)	Powdery mildew patches covering 51%-70% of the leaf area
11	>70	Highly susceptible (HS)	Powdery mildew patches covering >70% of the leaf area



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Red rot of sugarcane

Table 1 Red rot categories in relation to different lesion lengths (Chona 1954; Srinivasan and Bhat 1961).

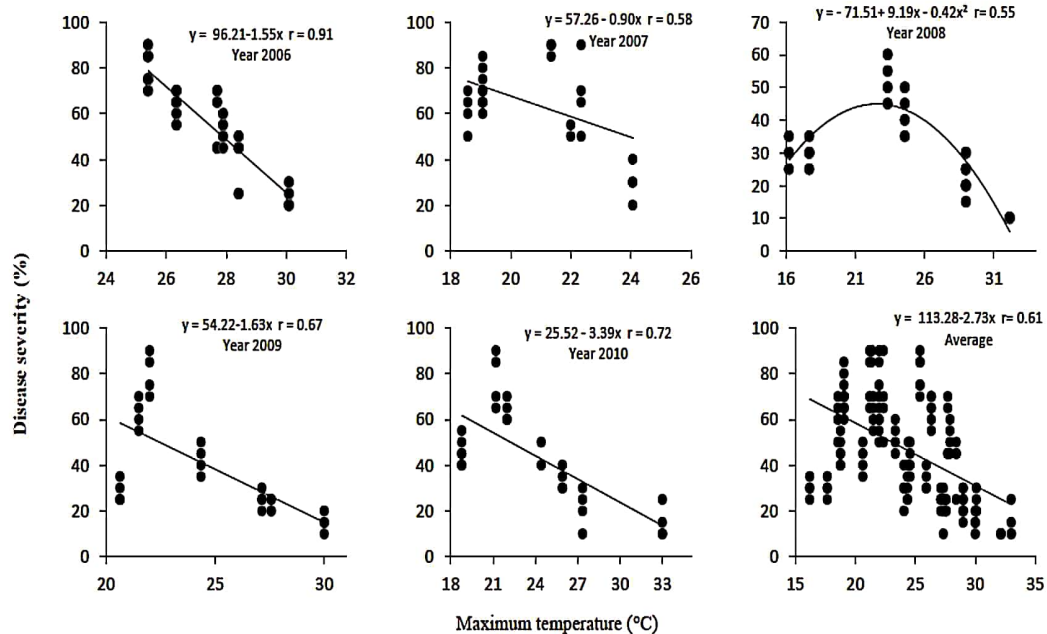
Average lesion length (inches)	Red rot reaction
<5.0	Highly resistant
5.0-15	Resistant
15-30	Moderately resistant
>30	Susceptible

Table 3 Categorization of red rot reactions (Srinivasan and Bhat 1961).

Score on the 0-9 Scale	Reaction category
0.0 - 2.0	Resistant (R)
2.1 - 4.0	Moderately resistant (MR)
4.1 - 6.0	Moderately susceptible (MS)
6.1 - 8.0	Susceptible (S)
8.1 - 9.0	Highly susceptible (HS)

Charcol rot of sunflower

Disease scale	Percent infection	Disease response
0	0	Field immune
1	0.01–10	Highly resistant
2	10.01–20	Resistant
3	20.01–30	Moderately resistant
4	30.01–40	Moderately susceptible
5	40.01–50	Susceptible
6	> 50	Highly susceptible

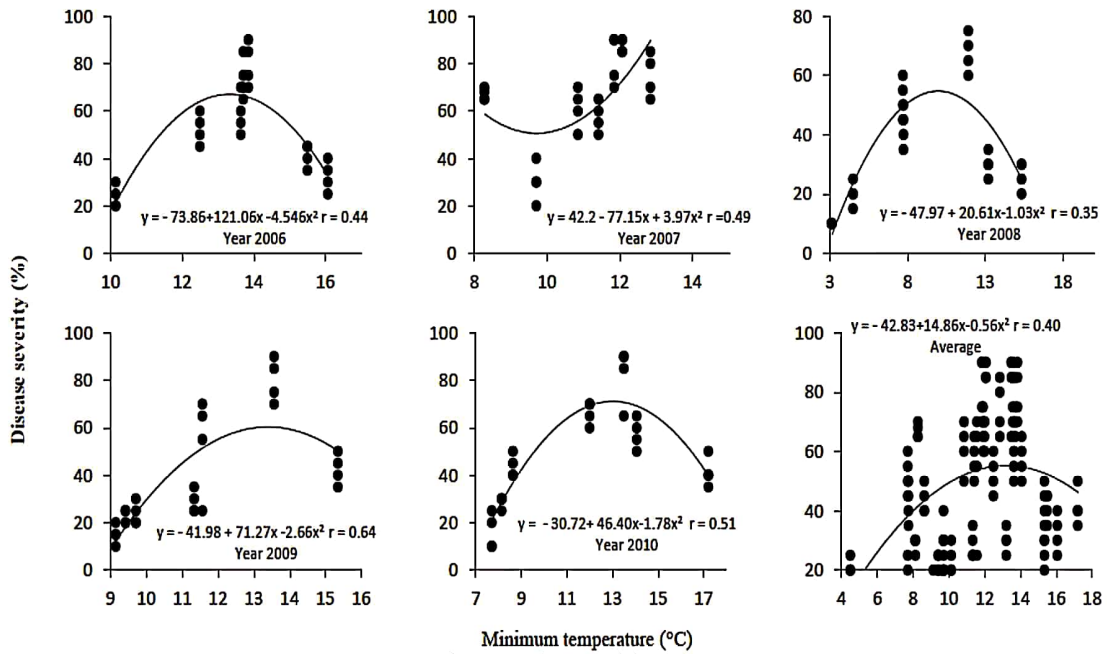


Maximum temperature (°C)
 Y = Disease severity, x = Maximum temperature



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Scatter plot of chickpea ergot disease severity to minimum temperature



Minimum temperature (°C)
Y = Disease severity, x = Minimum temperature



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Tomorrow Questions for discussion

- Q. No. Why rating scales are developed?
- Q. No. What do rating scales explain?
- Q. No. What do you understand about spreader.
- Q. No. Do spreader has some other name?
- Q. No. How the spreaders are planted in screening nursery?
- Q. No. what is your opinion about regression and correlation analysis?
- Q. No. I am sharing some graphs, we will discuss in detail these graphs?