



# Force based on initial and Secondary inoculum

**Initial Inoculum** - Ascospore  $\rightarrow$  1, 2 months following after ~~break~~ break

Fungicide :- Blooming  
Early stage  
Fruit development

## Secondary Inoculum:-

Apple scab.

Venturia inaequalis  $\rightarrow$  Formation of conidia. Require wetness. temperature  $6-28^{\circ}\text{C}$  conidial disease development.

$\uparrow$  Fruit and leaf wetness that will be completed 20 hours. But if  $18-24^{\circ}\text{C}$  then 9 hour

If we have info of temp + wetness then we can demonstrate, so

- \* When infection period will occur
- \* How much disease will come.

## 2. Rust:-

we can forecast  $\rightarrow$  Brown  $\rightarrow$  P. Recondata leaf before 1+2 weeks. Black  $\rightarrow$  P. Graminis stem

3. We can predict the insect transmitted viruses.

1. Cucumber mosaic virus
  2. Barly yellow dwarf
  3. Sugar beet yellow
- } vector Aphid  
we can judge by counting No. of Aphid.

**Co-lateral**:- Same family that is other than main host. Same family of main host has.

**Alternate**:- Other than main.

We will check the viruliferousity of aphid by ELISA or Molecular technique. Then we can judge how much disease will come in next week.

## Risk assessment of plant Disease

### Epidemics

A risk of disease to go to the epidemic. The probability of disease to become an epidemic. When we know probability then we get the risk of epidemic. It is counted in the quantity or percentage.

1. Low
2. High
3. Moderate

→ epidemic incidence is a part of all disease. By E.I we can find probability of Risk.

If the incidence of Tomato late blight is 10% then we can find probability of Risk is 8% and if probability is 90% and incidence will be 60%.

when we do Risk Assessment, we should know.

1. Host
2. Environment
3. pathogen

when we should also know history Resistance of the variety, period of susceptibility of the host, prevailing weather condition

what control measures were in practise. Estimation of primary + secondary inoculum, Temp, moisture, appearance of first sign of the disease, then we will be able to do risk assessment.

## Disease warning systems:-

Warning is given before the incoming of warning of disease agents or worker of extension department do so.

It is known to the worker or agent that which disease will come in field. They collect data and give to pathologist, he will assess the data and make risk assessment.

They will communicate by E-mail or fax and give to Agri-department and then agri-department will give the precaution and issue warning.

If it is national problem then give data to the national level. If it is nation issue so National disaster authority management (**NDAM**).

## Forecast models:-

**1970s - BLITCAST.** info collected and put data into model, (pathogen, Env, variety, host). then the system will do calculation and give email to Federal, Agri-department,

# Plant Pathology

## PP-308

### Practical Part

et6

Sheet7

Sheet8

Sheet1

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	A	B	C	D	E	F	G	H	I	J	K
1	VAR	DT	VAR	DE	MAN	MIN	RH	RF	WG	Model regression	Model Regression Model
2	1	1	1	30	26.35	10.14	55.57	0	3.28		32.2421
3	1	1	2	35	26.35	10.14	55.57	0	3.28		32.2421
4	1	1	3	35	26.35	10.14	55.57	0	3.28		32.2421
5	1	1	4	40	26.35	10.14	55.57	0	3.28		32.2421
6	1	2	1	30	27.71	12.5	52.85	0	2.67		34.2257
7	1	2	2	35	27.71	12.5	52.85	0	2.67		34.2257
8	1	2	3	40	27.71	12.5	52.85	0	2.67		34.2257
9	1	2	4	35	27.71	12.5	52.85	0	2.67		34.2257
10	1	3	1	50	28.42	15.5	43.85	0	2.48		35.1004
11	1	3	2	45	28.42	15.5	43.85	0	2.48		35.1004
12	1	3	3	45	28.42	15.5	43.85	0	2.48		35.1004
13	1	3	4	25	28.42	15.5	43.85	0	2.48		35.1004
14	1	4	1	85	27.71	13.85	50.28	14.6	3.38		52.111
15	1	4	2	80	27.71	13.85	50.28	14.6	3.38		52.111
16	1	4	3	75	27.71	13.85	50.28	14.6	3.38		52.111
17	1	4	4	75	27.71	13.85	50.28	14.6	3.38		52.111
18	1	5	1	20	30.1	13.64	36.14	0	3.28		24.0838
19	1	5	2	25	30.1	13.64	36.14	0	3.28		24.0838
20	1	5	3	15	30.1	13.64	36.14	0	3.28		24.0838
21	1	5	4	15	30.1	13.64	36.14	0	3.28		24.0838
22	1	6	1	55	27.9	16.07	42.42	5.2	4.77		42.1319
23	1	6	2	50	27.9	16.07	42.42	5.2	4.77		42.1319
24	1	6	3	40	27.9	16.07	42.42	5.2	4.77		42.1319
25	1	6	4	45	27.9	16.07	42.42	5.2	4.77		42.1319
26	1	7	1	60	25.4	13.71	57.14	8.8	5.3		52.4945
27	1	7	2	65	25.4	13.71	57.14	8.8	5.3		52.4945
28	1	7	3	55	25.4	13.71	57.14	8.8	5.3		52.4945
29	1	7	4	50	25.4	13.71	57.14	8.8	5.3		52.4945
30	2	1	1	30	24.07	9.71	50.57	0	1.07		31.7092
31	2	1	2	40	24.07	9.71	50.57	0	1.07		31.7092
32	2	1	3	20	24.07	9.71	50.57	0	1.07		31.7092
33	2	1	4	30	24.07	9.71	50.57	0	1.07		31.7092
34	2	2	1	90	19.07	12.07	71.14	36.5	2.5		96.345
35	2	2	2	90	19.07	12.07	71.14	36.5	2.5		96.345
36	2	2	3	85	19.07	12.07	71.14	36.5	2.5		96.345
37	2	2	4	85	19.07	12.07	71.14	36.5	2.5		96.345
38	2	3	1	68	18.57	8.28	71.42	10	1.71		59.0469
39	2	3	2	70	18.57	8.28	71.42	10	1.71		59.0469
40	2	3	3	65	18.57	8.28	71.42	10	1.71		59.0469
41	2	3	4	65	18.57	8.28	71.42	10	1.71		59.0469
42	2	4	1	50	21.35	10.85	66.14	9.4	1.78		57.3854
43	2	4	2	65	21.35	10.85	66.14	9.4	1.78		57.3854
44	2	4	3	70	21.35	10.85	66.14	9.4	1.78		57.3854
45	2	4	4	60	21.35	10.85	66.14	9.4	1.78		57.3854
46	2	5	1	60	22.35	11.42	59.57	0.7	3.37		43.9359
47	2	5	2	65	22.35	11.42	59.57	0.7	3.37		43.9359
48	2	5	3	55	22.35	11.42	59.57	0.7	3.37		43.9359
49	2	5	4	50	22.35	11.42	59.57	0.7	3.37		43.9359
50	2	6	1	90	22	11.85	52.14	26.1	4.04		69.4629
51	2	6	2	90	22	11.85	52.14	26.1	4.04		69.4629
52	2	6	3	70	22	11.85	52.14	26.1	4.04		69.4629
53	2	6	4	65	22	11.85	52.14	26.1	4.04		69.4629
54	2	7	1	85	24.71	12.85	51.14	15.5	3.22		55.5716
55	2	7	2	80	24.71	12.85	51.14	15.5	3.22		55.5716
56	2	7	3	70	24.71	12.85	51.14	15.5	3.22		55.5716
57	2	7	4	65	24.71	12.85	51.14	15.5	3.22		55.5716
58											
59											

Sheet2

Sheet3

Sheet4

Sheet5

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	A	B	C	D	E	F	G	H	I	J
1	SUMMARY OUTPUT									
2										
3	<i>Regression Statistics</i>									
4	Multiple R	0.862424243								
5	R Square	0.743775575								
6	Adjusted R Square	0.718153133								
7	Standard Error	11.37936185								
8	Observations	56								
9										
10	<i>ANOVA</i>									
11		<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>				
12	Regression	5	18794.345	3758.8691	29.028286	1.087E-13				
13	Residual	50	6474.4938	129.48988						
14	Total	55	25268.839							
15										
16		<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>	
17	Intercept	15.38047969	44.532809	0.3453741	0.731262	-74.0663	104.82726	-74.0663	104.82726	
18	MAX	-1.438123429	1.263136	-1.138534	0.2603234	-3.975207	1.0989599	-3.975207	1.0989599	
19	MN	2.31336921	1.3504532	1.7130318	0.0929019	-0.399096	5.0258343	-0.399096	5.0258343	
20	RH	0.565033396	0.3471121	1.6278127	0.1098506	-0.132162	1.2622285	-0.132162	1.2622285	
21	RF	1.111222321	0.2192467	5.0683644	5.868E-06	0.6708523	1.5515923	0.6708523	1.5515923	
22	WS	1.940306066	1.7388892	1.1158307	0.2698287	-1.552356	5.4329679	-1.552356	5.4329679	
23										
24										

Sheet2		Sheet3		Sheet4		She...		...
	A	B	C	D	E	F	G	H
1		<i>DS</i>	<i>MAX</i>	<i>MN</i>	<i>RH</i>	<i>RF</i>	<i>WS</i>	
2	<b>DS</b>	1						
3	<b>MAX</b>	-0.603644985	1					
4	<b>MN</b>	-0.069291764	0.683475387	1				
5	<b>RH</b>	0.550102796	-0.893952326	-0.6628926	1			
6	<b>RF</b>	0.820956136	-0.581203657	-0.0431233	0.46812514	1		
7	<b>WS</b>	0.115592747	0.365796951	0.60763073	-0.3452371	0.0923653	1	
8								
9								
10								
11								

Sheet2		Sheet3			Sheet4			Sheet5	...	
	A	B	C	D	E	F	G	H	I	J
1	SUMMARY OUTPUT									
2										
3	<b>Regression Statistics</b>									
4	Multiple R	0.8209561								
5	R Square	0.673969								
6	Adjusted R Square	0.6679314								
7	Standard Error	12.351657								
8	Observations	56								
9										
10	<b>ANOVA</b>									
11		<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>				
12	Regression	1	17030.414	17030.414	111.62841	9.413E-15				
13	Residual	54	8238.4255	152.56344						
14	Total	55	25268.839							
15										
16		<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>	
17	Intercept	40.333009	2.1599917	18.672761	3.197E-25	36.002486	44.663531	36.002486	44.663531	
18	RF	1.6252987	0.1538317	10.565435	9.413E-15	1.3168847	1.9337127	1.3168847	1.9337127	
19										
20										
21										



Sheet4	Sheet5			Sheet6		Sheet7		...	
	A	B	C	D	E	F	G	H	I
1		<i>DS</i>	<i>MAX</i>	<i>MN</i>	<i>RH</i>	<i>RF</i>	<i>WS</i>		
2	<b>DS</b>	1							
3	<b>MAX</b>	-0.603645	1						
4	<b>MN</b>	-0.0692918	0.68347539	1					
5	<b>RH</b>	0.5501028	-0.8939523	-0.6628926	1				
6	<b>RF</b>	0.82095614	-0.5812037	-0.0431233	0.46812514	1			
7	<b>WS</b>	0.11559275	0.36579695	0.60763073	-0.3452371	0.0923653	1		
8									
9									
10									

Sheet4

Sheet5

Sheet6

Sheet7

...

	A	B	C	D	E	F	G	H	I	J
1	SUMMARY OUTPUT									
2										
3	<b>Regression Statistics</b>									
4	Multiple R	0.862424243								
5	R Square	0.743775575								
6	Adjusted R Square	0.718153133								
7	Standard Error	11.37936185								
8	Observations	56								
9										
10	<b>ANOVA</b>									
11		<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>				
12	Regression	5	18794.345	3758.8691	29.028286	1.087E-13				
13	Residual	50	6474.4938	129.48988						
14	Total	55	25268.839							
15										
16		<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>	
17	Intercept	15.38047969	44.532809	0.3453741	0.731262	-74.0663	104.82726	-74.0663	104.82726	
18	MAX	-1.438123429	1.263136	-1.138534	0.2603234	-3.975207	1.0989599	-3.975207	1.0989599	
19	MN	2.31336921	1.3504532	1.7130318	0.0929019	-0.399096	5.0258343	-0.399096	5.0258343	
20	RH	0.565033396	0.3471121	1.6278127	0.1098506	-0.132162	1.2622285	-0.132162	1.2622285	
21	RF	1.111222321	0.2192467	5.0683644	5.868E-06	0.6708523	1.5515923	0.6708523	1.5515923	
22	WS	1.940306066	1.7388892	1.1158307	0.2698287	-1.552356	5.4329679	-1.552356	5.4329679	
23										
24										
25										

t4	Sheet5	Sheet6	Sheet7	...
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	A	B	C	D	E	F	G
1		<i>DS</i>	<i>MAX</i>	<i>MN</i>	<i>RH</i>	<i>RF</i>	<i>WS</i>
2	<b>DS</b>	1					
3	<b>MAX</b>	-0.60364499	1				
4	<b>MN</b>	-0.06929176	0.683475387	1			
5	<b>RH</b>	0.550102796	-0.89395233	-0.66289255	1		
6	<b>RF</b>	0.820956136	-0.58120366	-0.04312328	0.468125144	1	
7	<b>WS</b>	0.115592747	0.365796951	0.607630734	-0.34523713	0.092365301	1
8							
9							
10							
11							
12							
13							