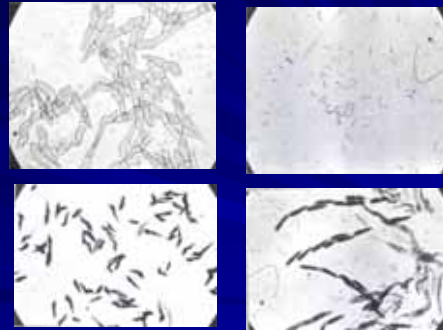


# THE EPIDEMIOLOGY AND HOST PARASITE INTERACTION OF SALB

## SPORES OF *M. ulei*



## DISEASE INFECTION

Conidia and ascospores are responsible for infection.

## DISEASE SPREAD

- Wind and rain splash;
- Insects and other animals;
- The ascospores initiate new disease cycle and the conidia are responsible for local spread of the disease.

## GERMINATION

## Conidia Infecting *Hevea* leaf

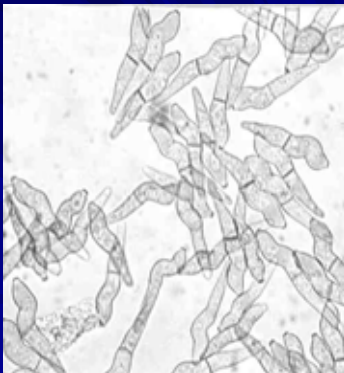


## Infection by conidia



## SPORE GERMINATION

- Distal end of the conidia germinated first followed by the proximal cell;



## GERMINATION OF CONIDIA

- The conidia germinate within two hours;
- Hyphae penetrate directly or by forming appressoria;
- Formation of appressoria is influenced by resistance of leaves;
- Fungus spread intercellularly;

## SPORE GERMINATION

Conidia germinate between 8 – 36 °C (maximum 24 °C);

## RATE OF CONIDIAL GERMINATION

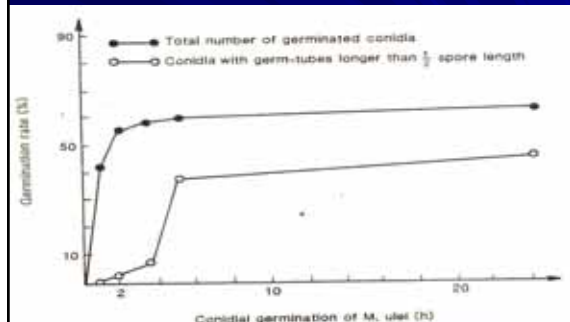
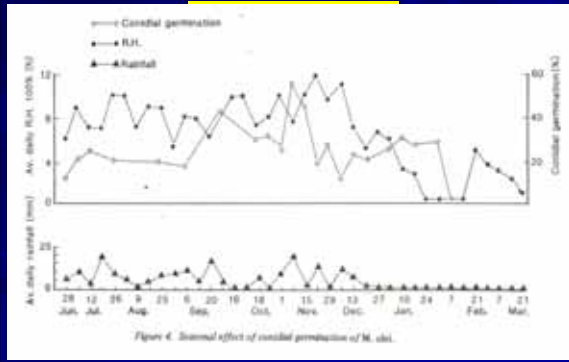


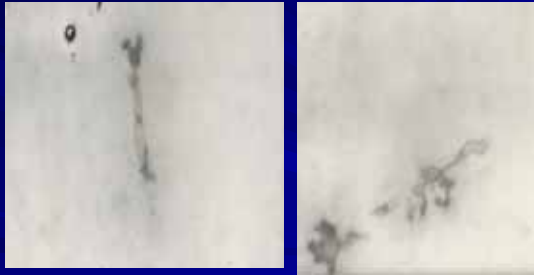
Figure 3. Rate of conidial germination of *M. ulm* in relation to time.

## SEASONAL EFFECT OF CONIDIAL GERMINATION



## HOST REACTION AND DISEASE DEVELOPMENT

### HOST CELL COLLAPSE



### DISEASE DEVELOPMENT

- Lesion is visible by two days of infection;
- Host reaction is dependent on resistance of leaves;
- Host cell collapse may occur;
- Age of leaves and clonal resistance determine number and size of lesions

### INFLUENCE OF WEATHER ON DISEASE

## EFFECT OF RAINFALL ON SEVERITY

### ■ High Severity

- Annual rainfall > 250 cm, well distributed with no long dry season

### ■ Intermediate Severity

- Annual rainfall > 200- <250 cm, well distributed with no long dry season

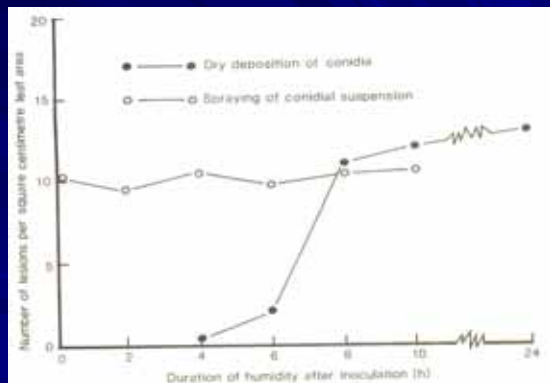
### ■ Low Severity

- Annual rainfall, variable with at least four months dry period with < 7 cm rain per month

## EFFECT OF HUMIDITY ON SALB

**Months with 18+ days with RH exceeding 95% for 10 hrs - severe SALB**

## EFFECT OF HUMIDITY ON INFECTION



## SPORE PRODUCTION

- Spore production vary with weather conditions;
- Optimum temperature for spore production is 24 °C;
- High humidity favors spore production.

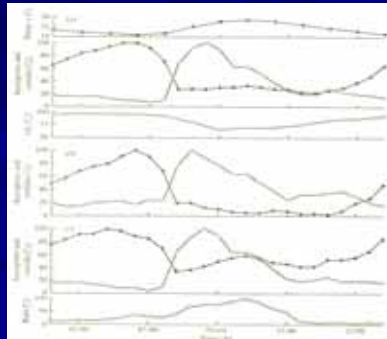
## **SPORE LIBERATION**

## SPORE LIBERATION

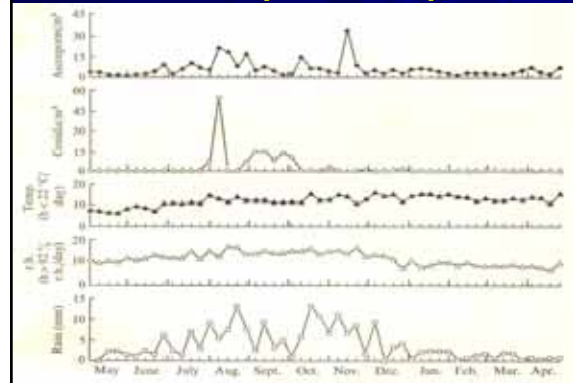
- Spore liberation varies with weather conditions;
- Diurnal periodicity in liberation of spores:
- Conidia liberation:
  - Low at night and rises in the morning;
  - Peak at mid day (10.00 a.m. to 12.00 p. m.) and declines there after;
- Ascospore liberation
  - Ascospore are released at night and peak at 06:00 a.m.
- Liberation of conidia and ascospores is high after a rainfall;

## DIURNAL PERIODICITY OF SPORE RELEASE

Conidia (empty dots);  
Ascospores (darkened)



## Annual dispersal of spores



## Viability of spores

- Viability of spores depend on weather condition especially moisture and temperature;
- Spores in fruiting bodies remain viable for longer periods than detached spores;
- Several studies were made on viability of spores.

## VIABILITY OF SPORES

- LANGFORD (1945)
  - High germination of conidia and ascospores kept for 3 days at 27 °C and 70% R.H.
  - 80 °F and 70% R.H. - some still germinated after 7 days
  - Conidia sprayed onto young leaves, then kept dry for 7 days still infect when re-moist
- HOLLIDAY (1970)
  - Kept at room condition for 18 days - Ten percent of conidia germinated

## Viability Of Spores Of *M. ulei*

Spores	Storage condition	Viability period
Conidia (detached)	24 °C, 65-95 % R.H.	3-4 weeks
Conidia (intact)	24 °C, 85-100 % R.H.	2 weeks
	24 °C, desiccation	16 weeks
Ascospores	24 °C, 85-100 % R.H.	9 days
Perithecia	24 °C, 65 % R.H.	3 weeks
	24 °C, 100 % R.H.	12 days

## VIABILITY

- Spores stored under cold and dry conditions survived longer;
- Conidia and ascospores obtained from leaves stored for long period in a refrigerator remain viable;
- Ascospores stored under desiccation survived for 15 days;
- Spores stored at -74 °C still survived.