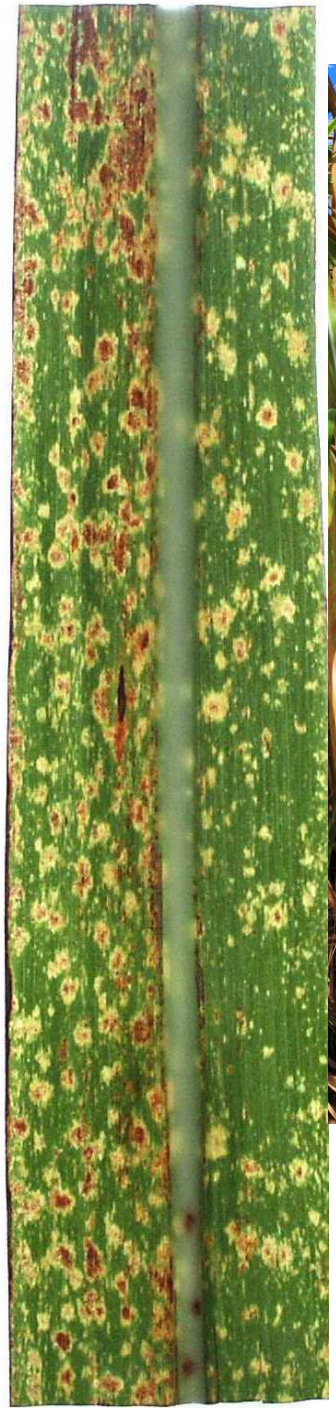


Incidence of yellow spot in the superhumid zone of Mauritius

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10th ISSCT Pathology Workshop, Nanning, China





Causal organism:

Mycovellosiella koepkei



Symptoms

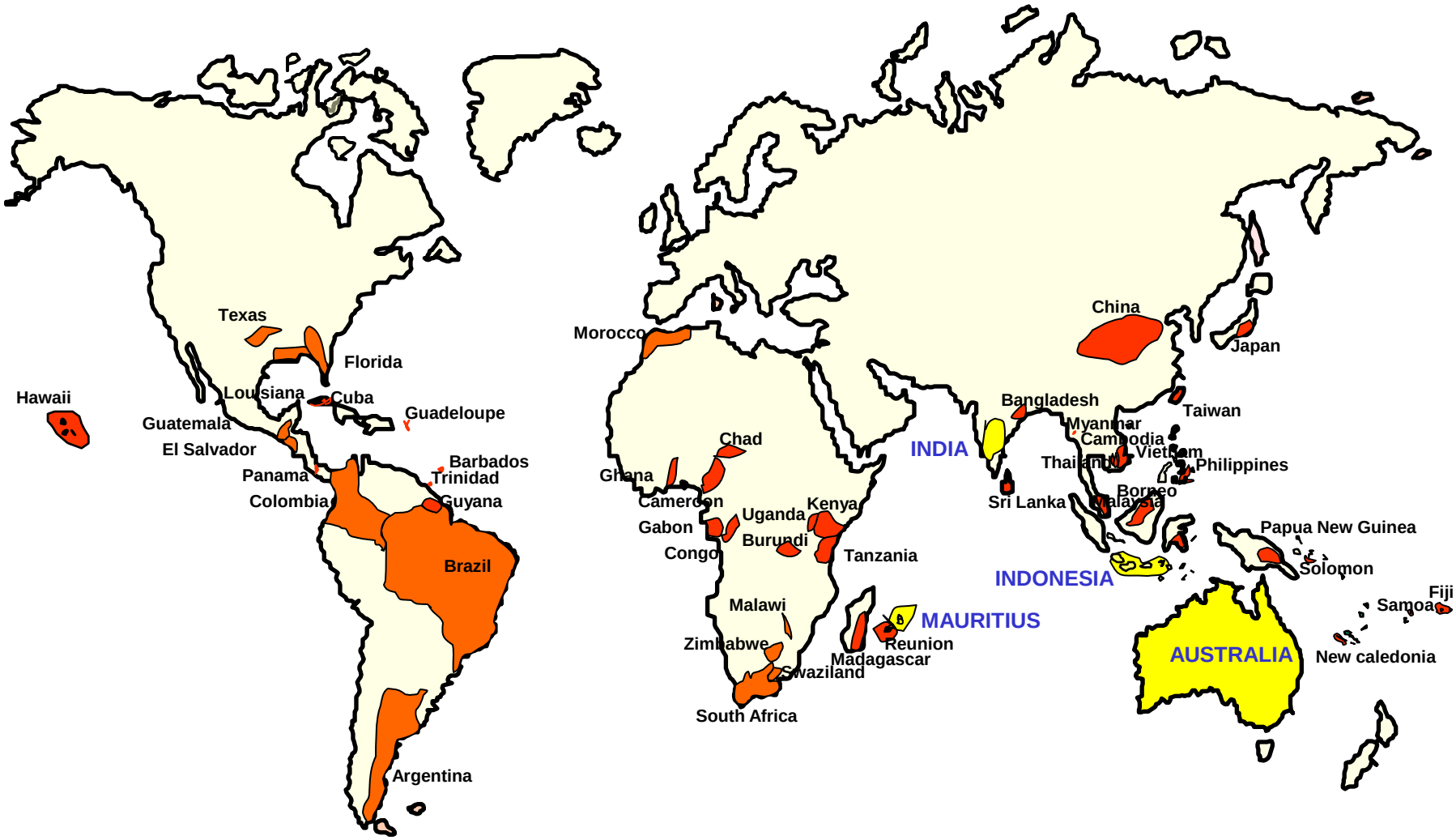
Irregular-shaped spots

Yellow to reddish colour

General rusty hue of leaves

Leaf necrosis

DISTRIBUTION OF YELLOW SPOT – 45 countries



Characteristics of varieties with enhanced yellow spot infection

- Profuse flowering » no new leaf development » more vulnerable
- Dense canopy and adhering leaves » favourable humid microclimate

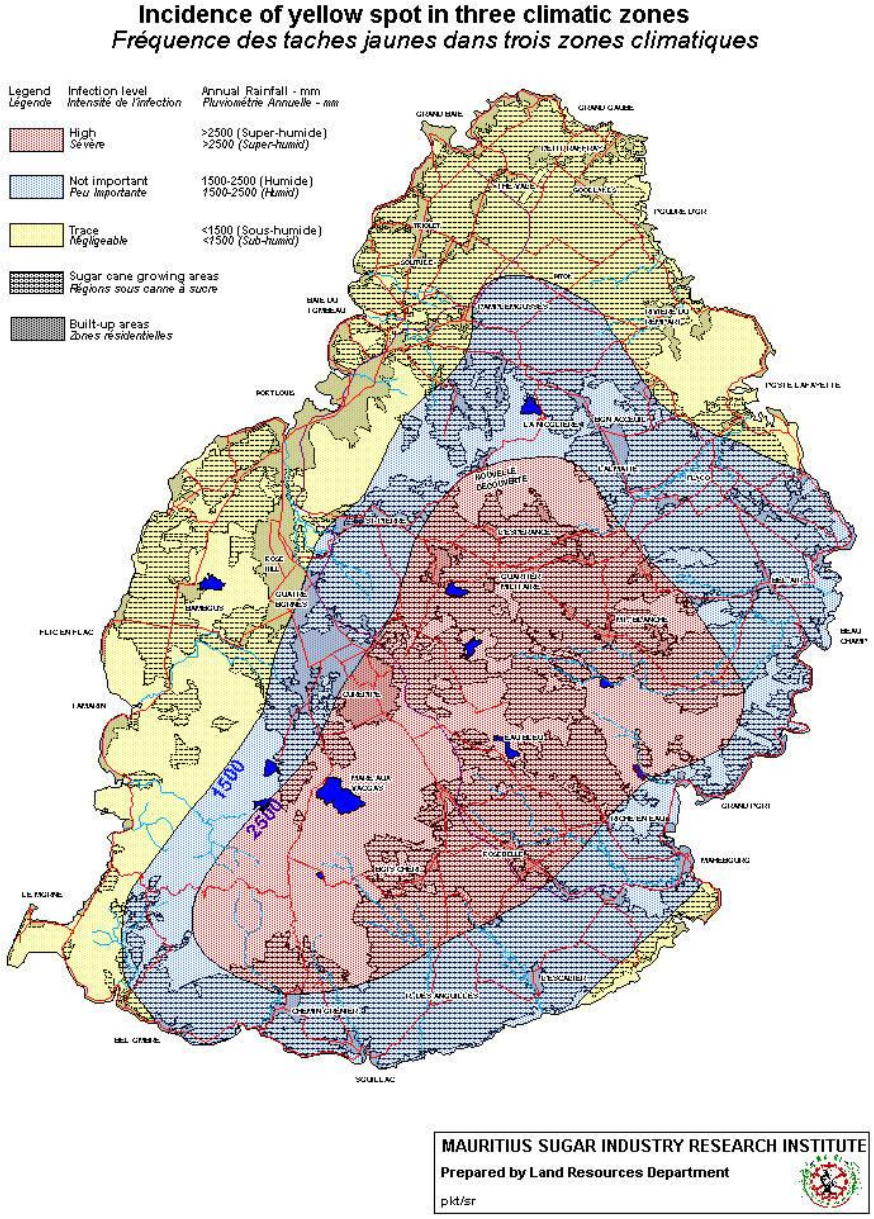




EFFECTS OF YELLOW SPOT

1. Loss of sugar at early harvest
2. Cane yield loss at late harvest
3. High reducing sugar/sucrose ratio
   » juice purity affected
5. More severe infection in flowering stalks





Favourable conditions for disease development in superhumid area (centre)

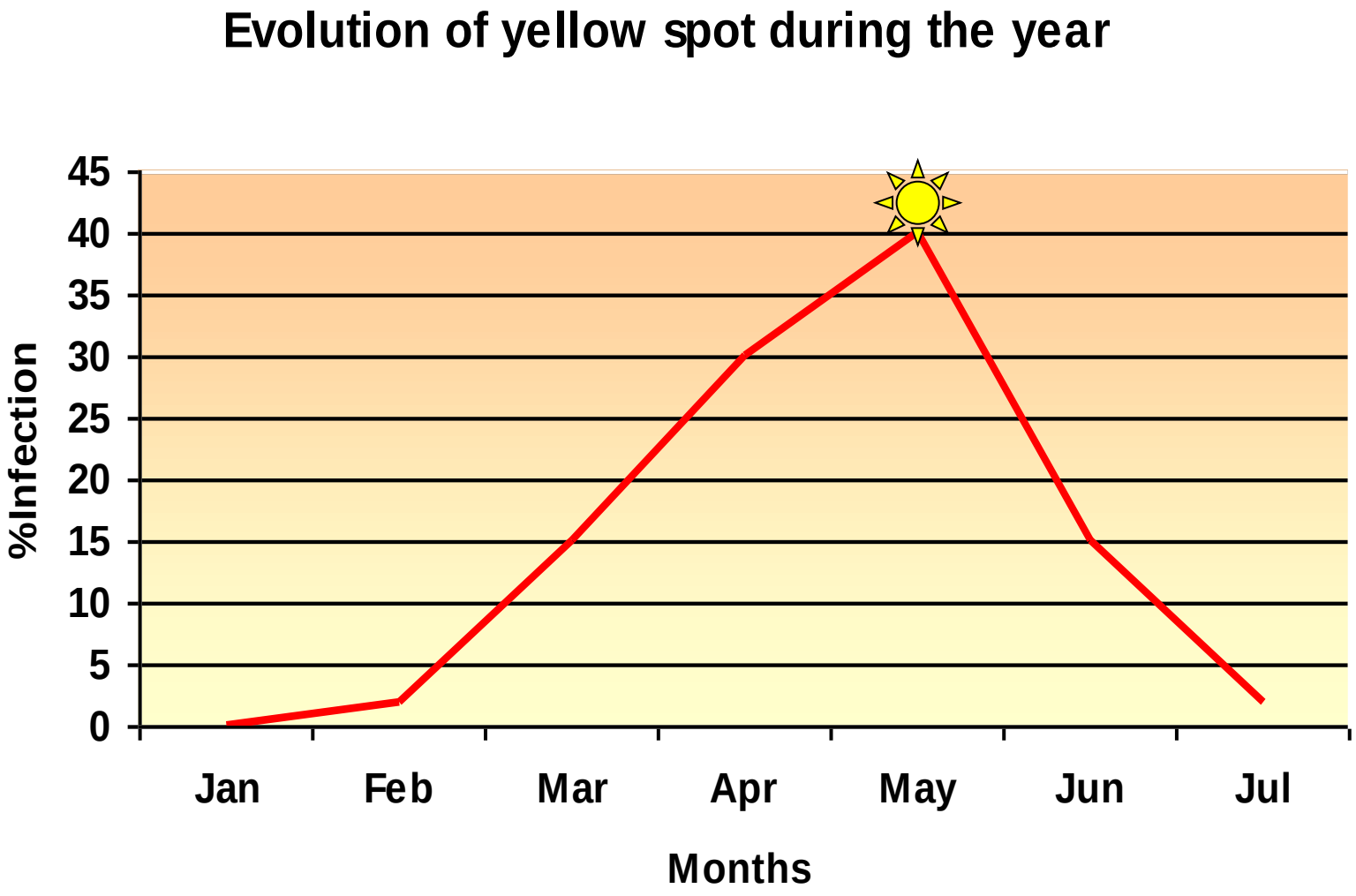
Area under sugar cane in superhumid: 10 000 ha

High relative humidity
- cloud cover
- microenvironment within cane canopy

Moderate temperatures

Low incidence in humid and sub-humid zones

12 of 20 varieties cultivated commercially over the island, are susceptible to the disease


Evolution of yellow spot during the year
%Infection
45
40
35
30
25
20
15
10
5
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Months

Monitoring of yellow spot in B 3337

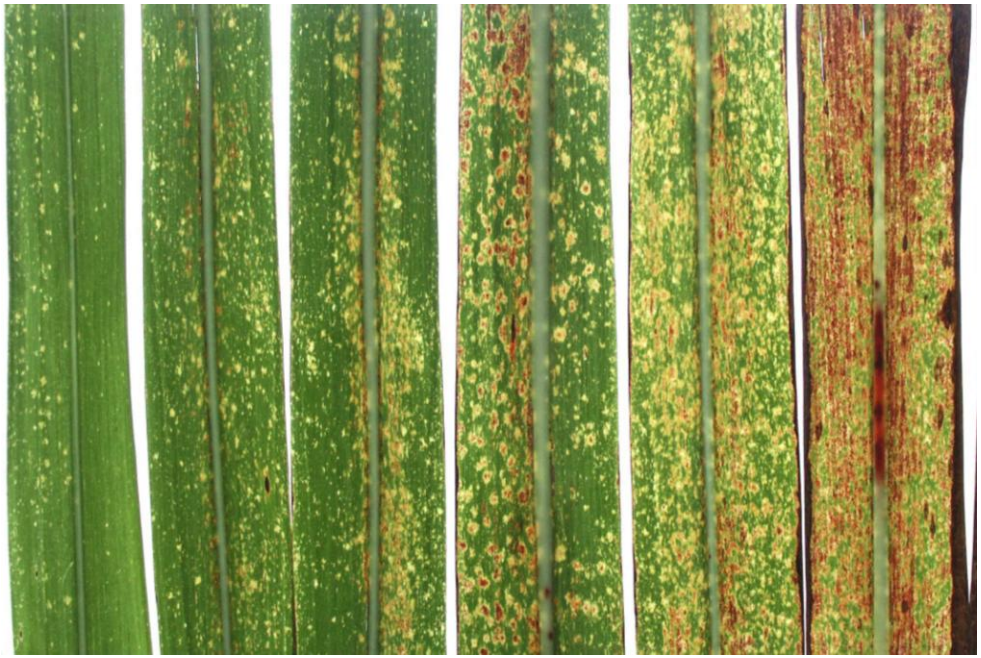


- B 3337 is a non-cultivated highly susceptible
- Used as a reference variety for yellow spot infection in trials since 1972
- Surveys site: Union Park (3472 mm annual rainfall, 357 m altitude)
- Monthly surveys: January-August to estimate percentage infection

Visual estimation of percentage infection

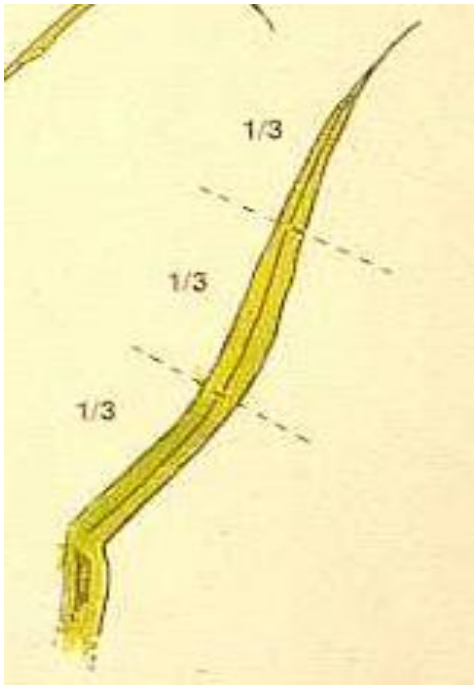


10 leaves/stalk for 5 stalks



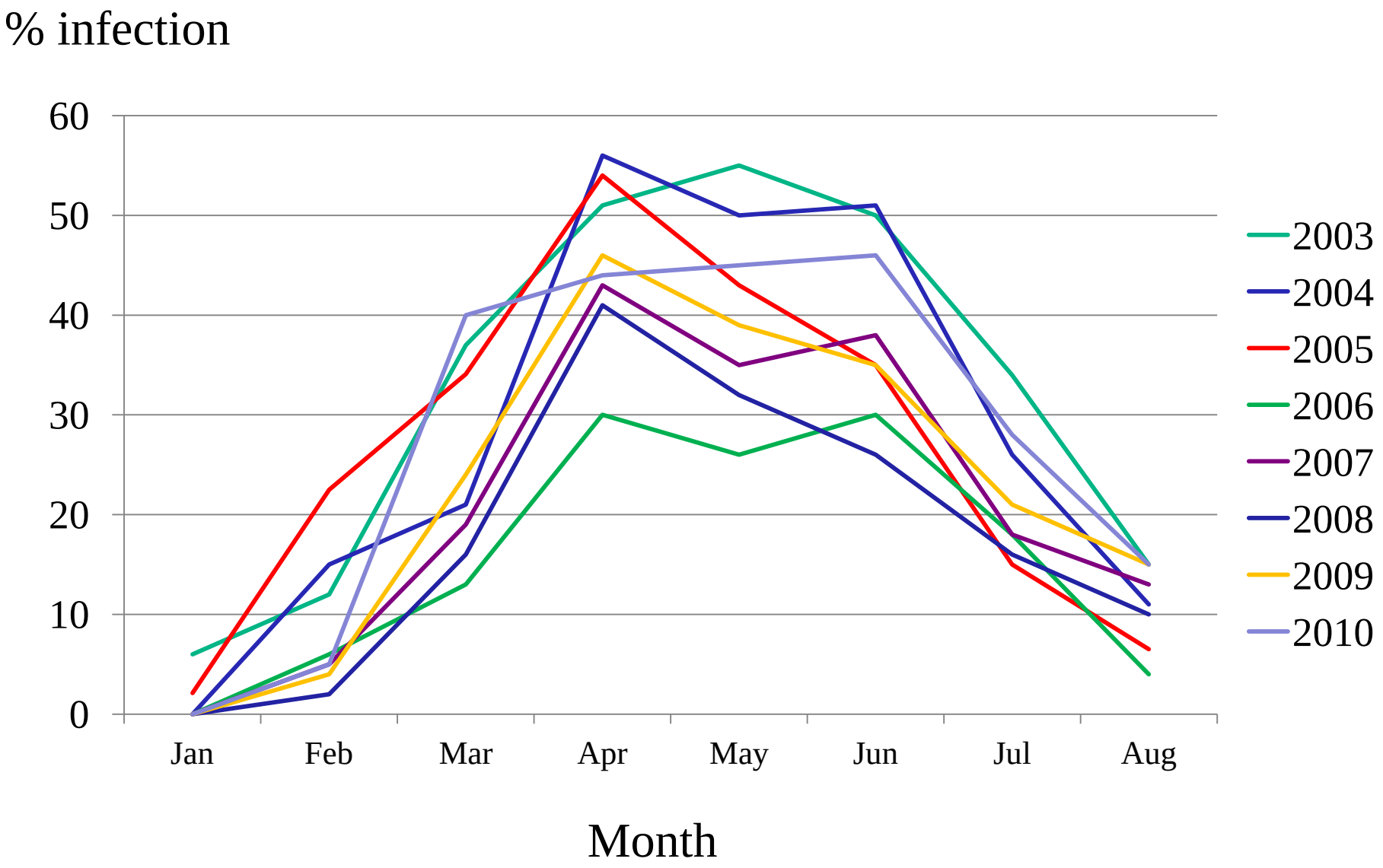
5% 10% 20% 40% 60% 80%

Assessment scale

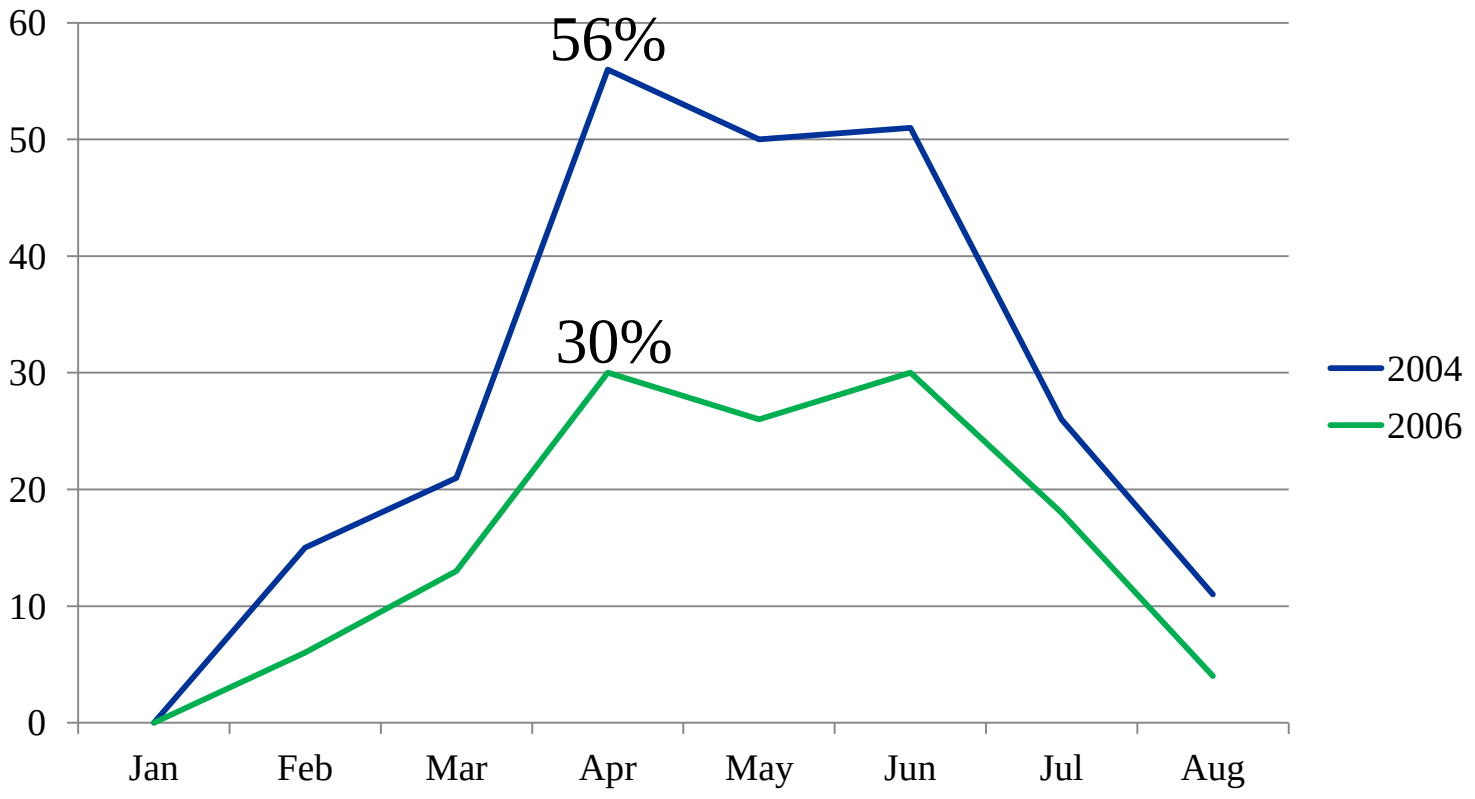


Infection estimated on each third of leaf

Incidence of yellow spot in cv. B 3337 from 2003-2010



Incidence of yellow spot in cv. B 3337 in 2004 and 2006



Monitoring of yellow spot Infection in B 3337 – significance of results

- Infection varies from year to year but remains high ranging from 24% in 2011 to 56% in 2004
- Overall mean infection is situated at 44%
- Under such high inoculum pressure in the superhumid zone, yield losses in susceptible and highly susceptible cultivars would occur year after year if such varieties are cultivated
- Variety screening for resistance to the disease should continue to be emphasized



Monitoring of yellow spot Infection in B 3337 – influence of weather conditions

- Although rainfall can grossly be observed to have an effect, the disease is influenced by temperature drops – the combined effect, relative humidity and sunshine hours should be taken into account to explain the yearly variation
- We are trying to comprehend weather data with respect to yellow spot incidence
- The information would be useful in the epidemiology of the disease



Variety screening programme

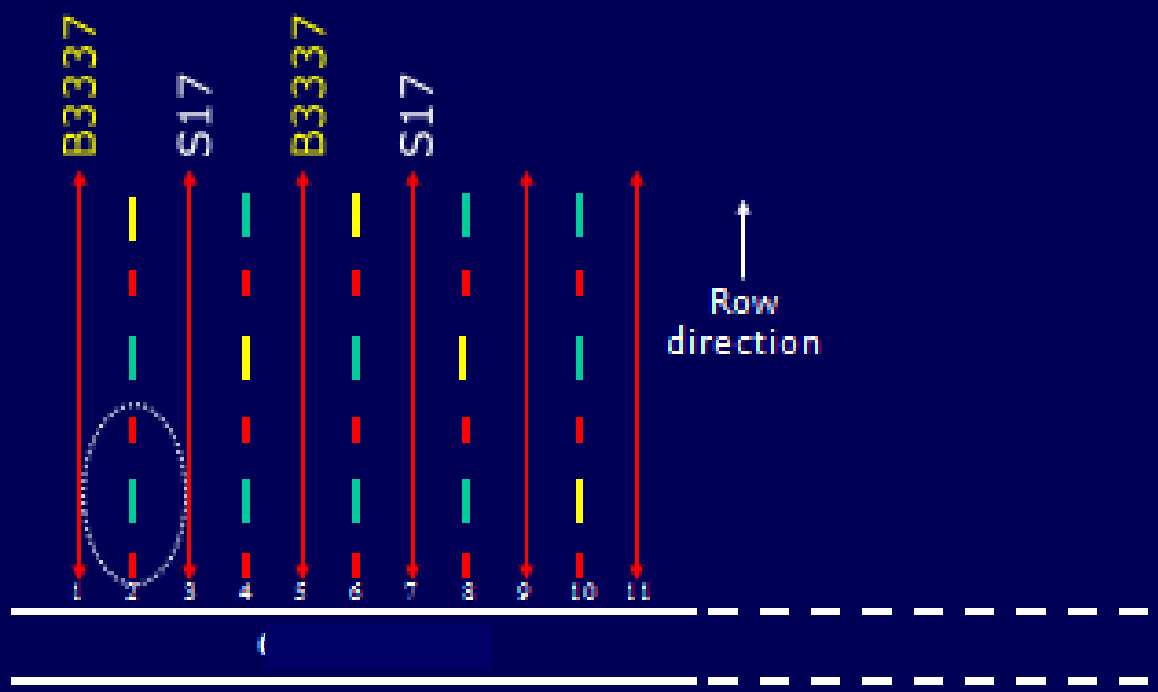
Between 60-130 varieties at advanced stage of selection are screened to yellow spot in plant cane, 1st and 2nd ratoon

Infection tends to increase from plant cane to 2nd ratoon

Varieties are rated as:	
Resistant:	0-5%
Slightly susceptible:	>5-15
Susceptible:	>15-25
Highly susceptible:	>25



Layout of Yellow Spot Resistance Trials (UPSES)



Full spreader rows of Highly Susceptible Varieties B 3337 & S17 alternate

1.5m spreader row

New variety under test, 3m

Control plots replicated (R, SS, S, HS)

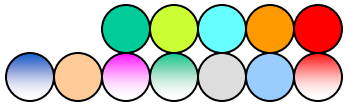
Screening of promising varieties against yellow spot

Reaction of varieties against yellow spot						No. Rejected*	% Rejected
Year of Trial	R	SS	S	HS	Total No.	(S+ HS)	
2008	5	15	17	29	66	46	69.7
2007	10	13	19	29	71	48	67.6
2006	28	13	17	21	79	38	48.1
2005	28	26	25	11	90	36	40.0
2004	10	23	21	37	91	58	63.7
2003	11	21	15	29	76	44	57.9
2002	10	11	11	31	63	42	66.7
2001	35	31	21	41	128	62	48.4
2000	28	18	31	50	127	81	63.8
1999	20	33	37	23	113	60	53.1
						MEAN	57.9

*Rejected for superhumid zone

Variety screening programme

- The number of susceptible and highly susceptible varieties ranged from 40-70% (although they can still be exploited if adapted to other agroclimatic zones)
- Varieties for the superhumid zone are scarce
- A sub-project of the breeding programme has been initiated to address this issue
- Resistant & slightly susceptible parents are now used in the new programme – the inheritance is governed by a major gene + minor ones
- Mapping QTLs using molecular markers for yellow spot resistance is in progress



CONCLUSION

- Yellow spot is currently the most important disease in Mauritius
- Its level fluctuates from year to year and is more often average to above average
- Resistance is not readily available in the parental lines – resulting inefficiency and a scarcity of varieties to the superhumid zone
- To ensure success, emphasis is being placed on resistance as a priority trait in the breeding programme

