Workshop
"Climate Change and Natural Rubber Systems"

Climate change and its impact on outbreak of Pestalotiopsis epidemic of Hevea in South Sumatra

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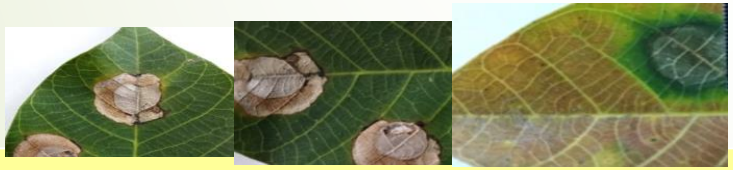


INDONESIAN RUBBER RESERACH INSTITUTE

Rubbe Diseases in Indonesia

ROOT DISEASE

STEM DISEASE

TAPPING PANEL DISEASE

LEAF FALL DISEASE

1. *Corynespora cassiicola*
2. *Colletotrichum gloeosporioides*
3. *Oidium heveae*
4. *Phytophthora palmivora*
5. *Helminthosporium heveae*
6. *Phyllosticta spesies*
7. *Capnodium spesies*
8. *Cephaleuros mycoidea*
9. *Guignardia heveae*
10. *Cylindrocladium quinqueseptatum*
11. *Fusicoccum spesies*
12. Pestalotiopsis
13. *Microcyclus ulei (not in indonesia)*

There are more than 25 kinds of diseases

TIME OF DISEASE INCIDENCE IN INDONESIA

	Apr	May	Jun	Jul	Agust	Sept	Okt	Nop	Dec	Jan	Febr	Mar
WHITE ROOT DISEASE												
RED ROOT DISEASE												
PINK DISEASE												
BARK NECROSIST FUSARIUM												
LUMP CANCER												
MOULDY ROT												
STRIP CANCER												
TAPPING PANEL DRYNESS												
CORYNESPORA LEAF FALL												
COLLETOTRICHUM LEAF FALL												
POWDERY MILDEW												
PESTALOTIOPSIS												
			Dry Seasson						Wet Seasson			

Pestalotiopsis laef fall disease

The first report occurred in Malaysia in 1975 in a nursery and attacked again in 2017

DISEASE INCIDENT IN INDONESIA

This disease first occurred in the North Sumatra region since 2016, then spread to the Southern Sumatra region at the end of 2017 until now

Affected area of this diseases in Indonesia

Data Februari 2018

22.084 hectare

Data April 2019

103.254 hectares

Data for July 2019

386.930 hectares

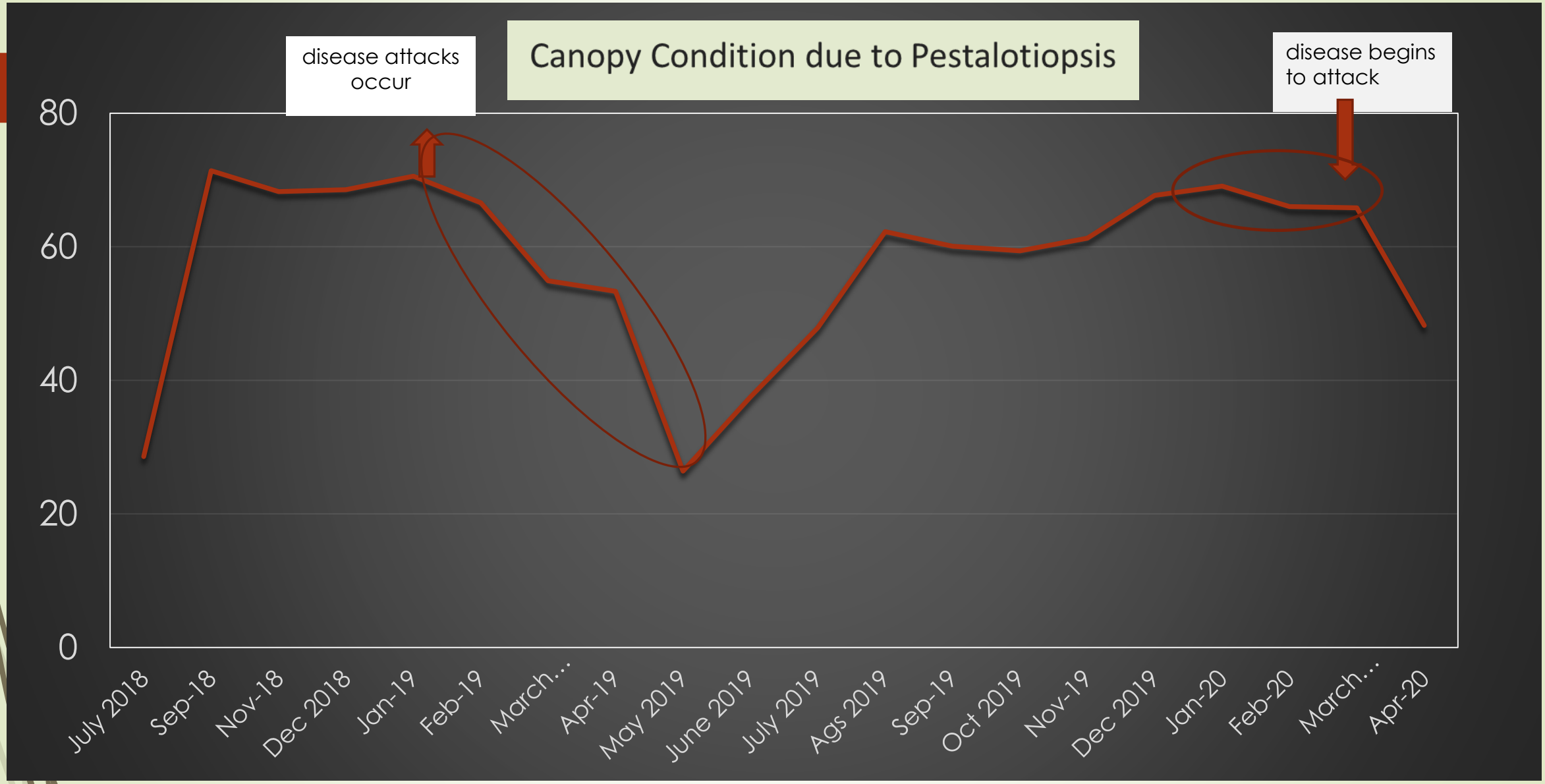
SYMPTOMS

Pestalotiopsis sp

Canopy condition scooring by IRRDB

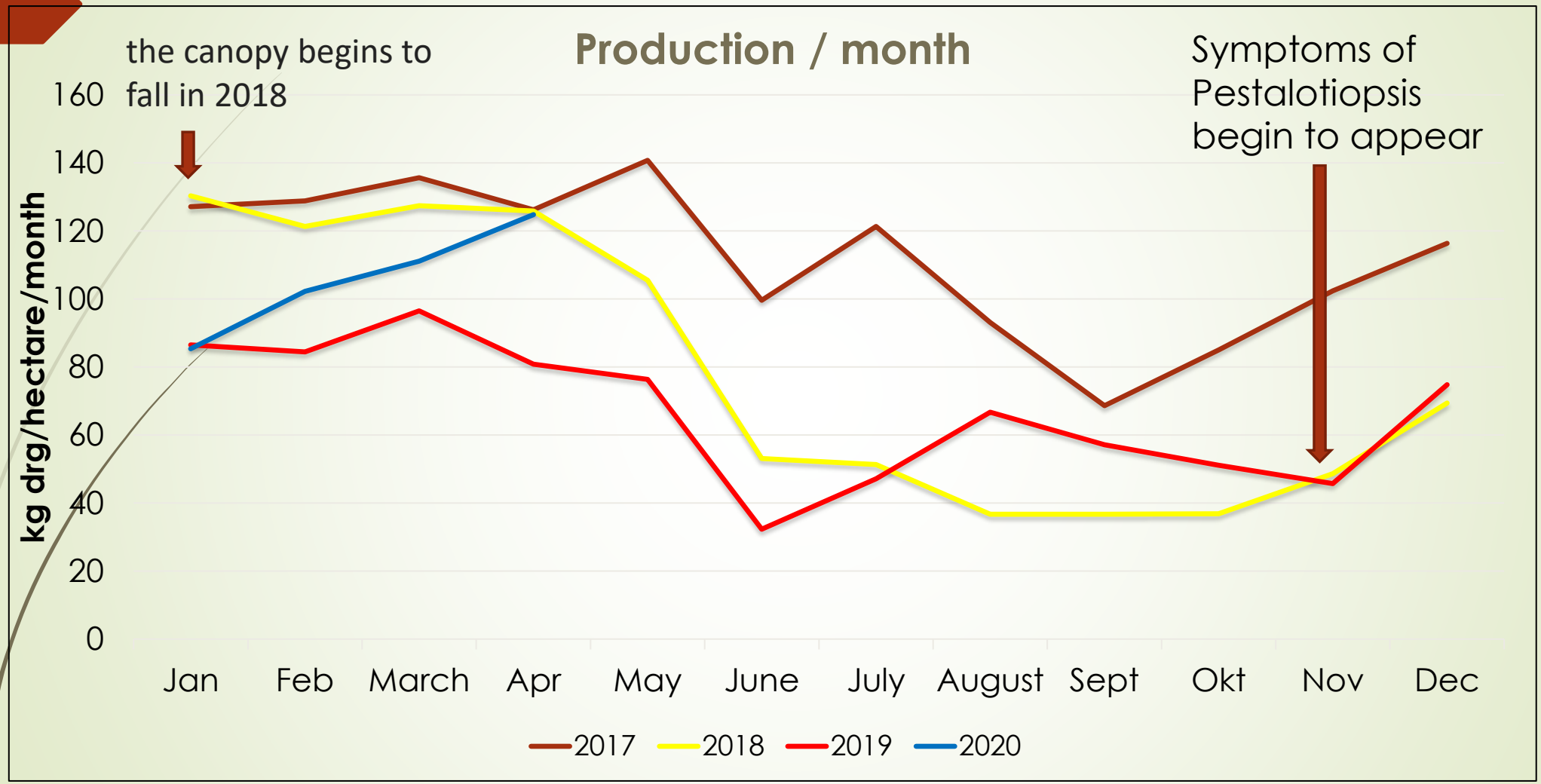
Index for the scoring disease severity (score index)
for determining the average disease seveirity index (ADSI)

Resistant	Light infections	Moderate infections	Severe infections	Very severe
SI = 0	SI = 1	SI = 2	SI = 3	SI = 4
No lesions	Lesions on few leaves	Lesions on few leaves	Lesions on most of the leaves	Lesions on all most all leaves
No defoliation	**No defoliation**	**Defoliation upto 25%**	**Defoliation upto 26 - 75%**	**Defoliation upto 76 - 100%**



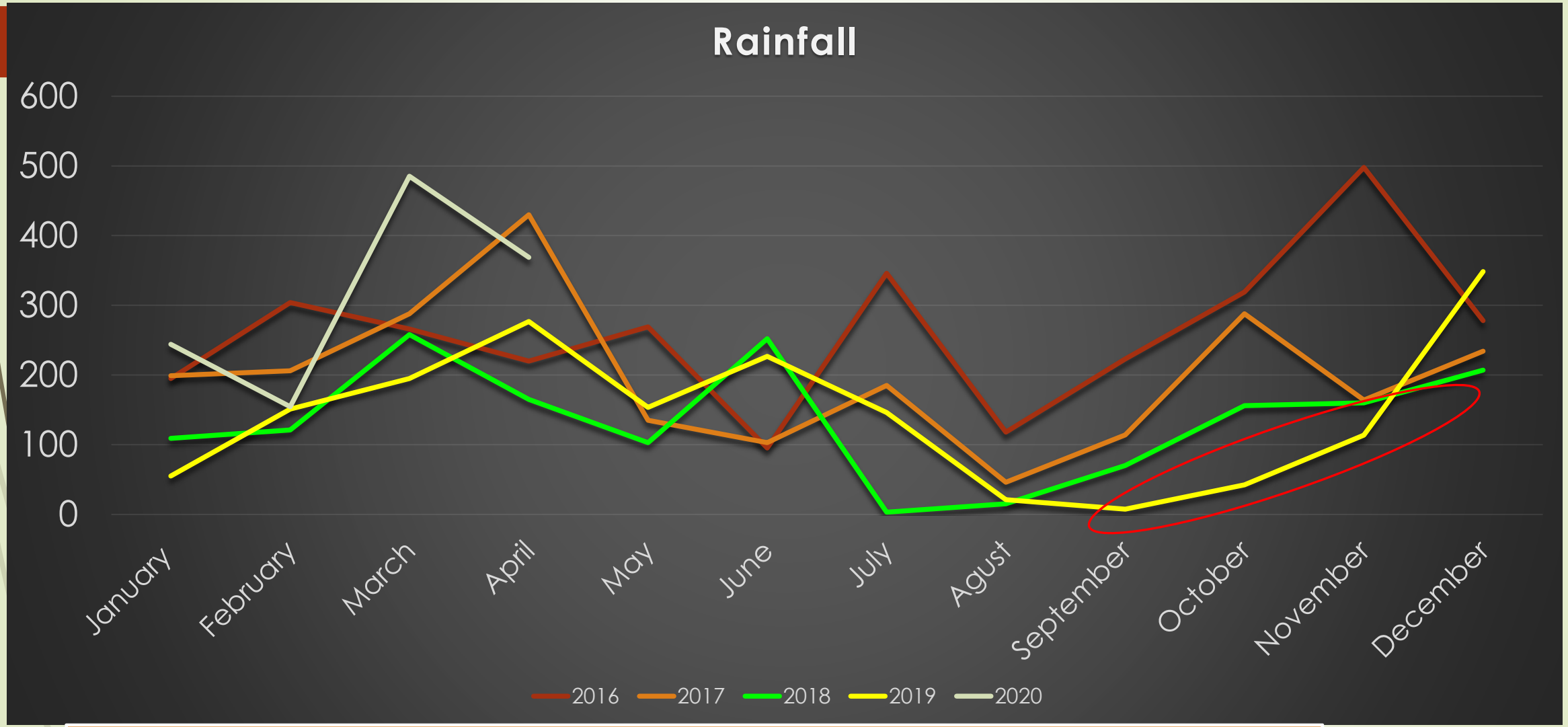
Wintering : June-july, refoliation/flush: the end of july, agustus

Impact of Pestalotiopsis LFD → Decreased production

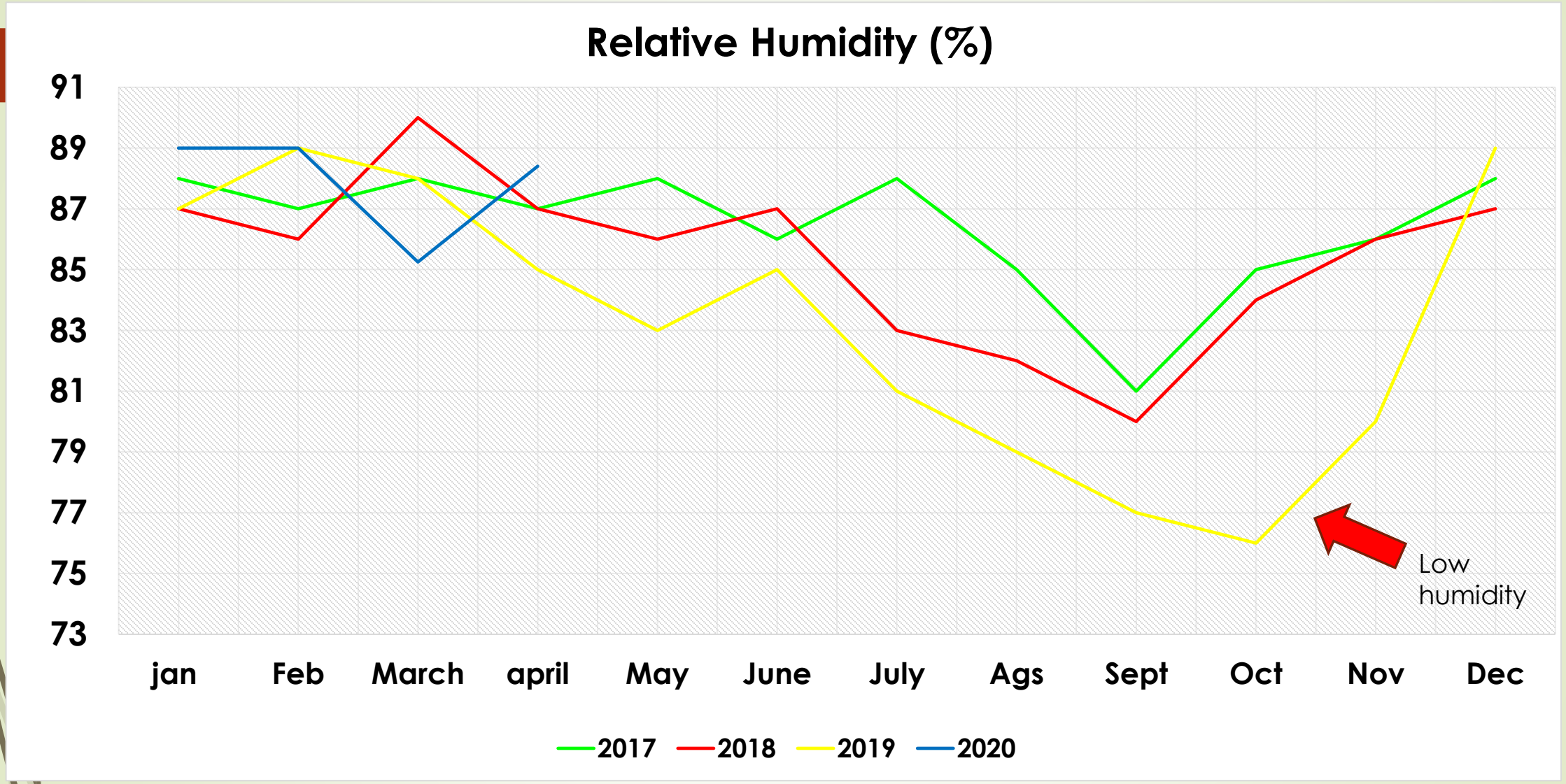


Production is still good until April 2020

wintering occurs in June and July

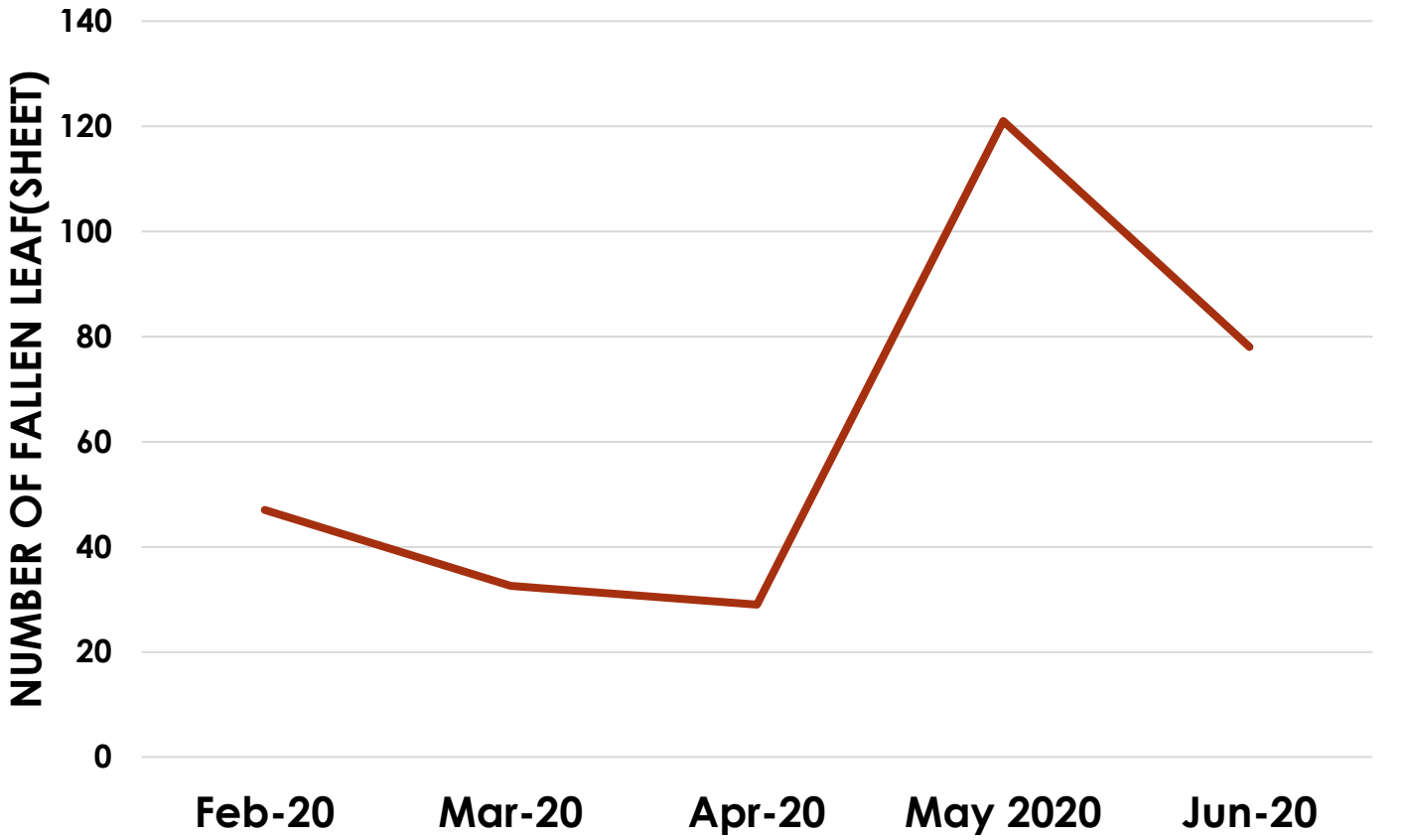


Beware : if rainfall > 100 mm/month
disease intensity will be severe if rainfalll > 300mm/bulan



Beware : if the daily average humidity is > 80%

Numbber of fallen leaf due to Pestalotiopsis



Disease intensity very severe occured April 18-19, 2020

only 2 days, all the leaves turn yellow and symptoms appear

Fallen leaf container

Automatic Weather Station

This condition can make the basis of time to controlling or application of fungicides so that the canopy can last until the peak of production, namely March and April

or can be used as early warning system

need epidemiological observations for at least 5-10 years

→ so we get early warning system model for this disease system

for example the Colletotrichum case

The influence of climate on the development of Colletotricum leaf fall disease in rubber plants

Climate condision			Influence on disease development	
			Suitable	Not suitable
A	Climate factor			
	1	Rainfall (mm/day)	15,2	10,5
	2	Rainy day (day)	5,4	3,4
	3	Rain speed (km/hour)	2,4	2,1
	4	Humidity (%)	88,8	87,4
	5	temperatur (^{0}C)	26,4	26,5
	6	The intensiy the solar radiation(cal/cm^2)	415,0	401,8
	7	Long sunshine (hour/day)	3,6	5,1
	8	Evaporation (mm/day)	3,7	-
B	Colletotrichum development			
	1	Diseases intensity (%)	65-95	5-35
	2	Air spore concentration (spore/mm^2)	16,4	7,4

The relationship between the Colletotrichum gloeosporioides epidemic and climatic conditions in rubber plants

year	Kind of season	Disease condition
1970	normal	
1971	normal	
1972	dry	
1973	wet	epidemic
1974	wet	epidemic
1975	wet	
1976	dry	
1977	dry	
1978	wet	
1979	normal	
1980	dry	
1981	wet	
1982	dry	
1983	dry	
1984	wet	epidemic
1985	normal	epidemic
1986	normal	
1987	dry	
1988	dry	
1989	normal	epidemic
1990	normal	
1991	dry	
1992	normal	
1993	normal	epidemic
1994	dry	
1995	normal	
1996	wet	epidemic
1997	dry	
1998	Normal	

Canopy condition

July 2018

September 2018

November 2018

January 2019

March 2019

April 2019

June 2019

Agustus 2019

September 2019

November 2018

January 2020

February 2020

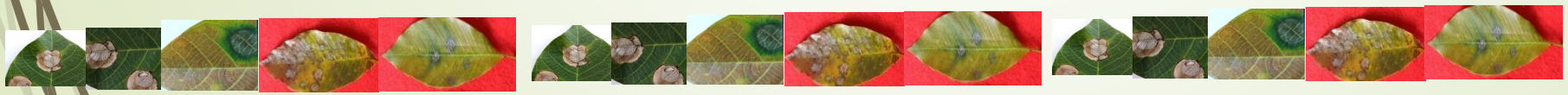
March 2020

April 2020

May 2020

CONCLUSION

1. Disease control is very important to be implemented to overcome the various attacks of the next diseases
2. The time of application of fungicides needs to be considered in order to be on target
3. Need epidemiological observation of disease so that it become the basis for early warning system




Thank you
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