NATIONAL PLAN

TO COMBAT THE LEAF FALL DISEASE IN THE RUBBER PLANTATIONS OF SRI LANKA [2023 - 2026]

Department of Plant Pathology & Microbiology
Rubber Research Institute of Sri Lanka

NATIONAL PLAN TO COMBAT THE LEAF FALL DISEASE IN THE RUBBER PLANTATIONS OF SRI LANKA
[2023, OCTOBER- 2026]

Guided by

MINISTRY OF PLANTATION INDUSTRIES

Implemented by

RUBBER RESEARCH INSTITUTE OF SRI LANKA
&
RUBBER DEVELOPMENT DEPARTMENT OF SRI LANKA
Sept, 2023

NATIONAL PLAN TO COMBAT THE LEAF FALL DISEASE IN THE RUBBER PLANTATIONS OF SRI LANKA
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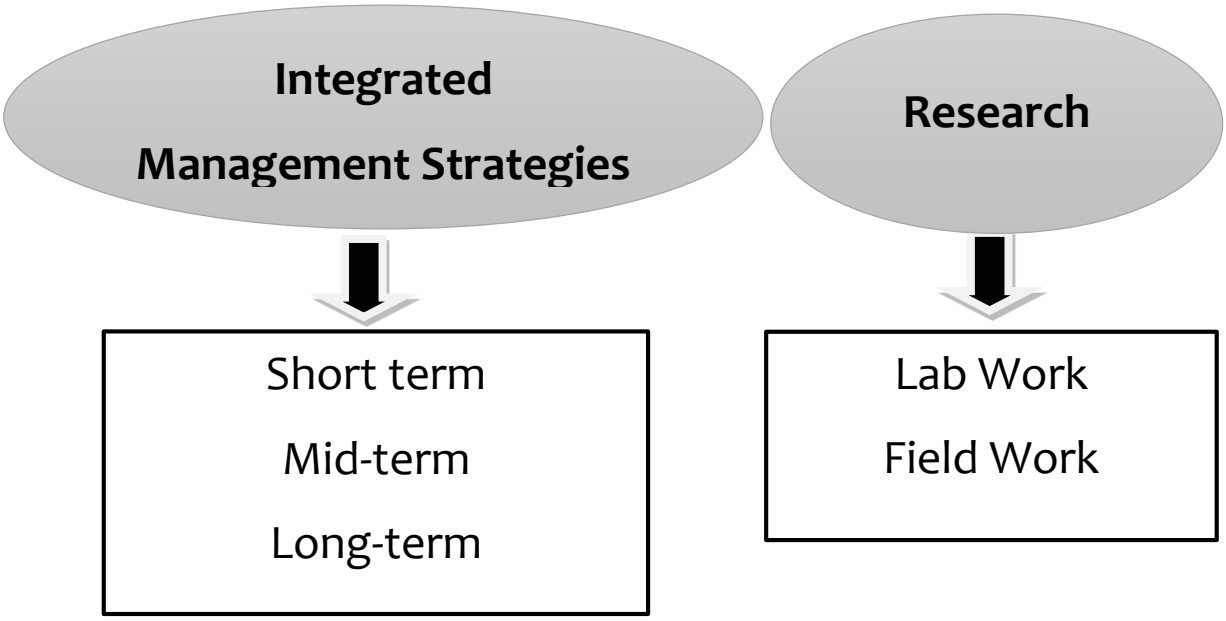
Strengthening the Implementation of the Recommended Strategies

Goal: National Program supports current research to be improved and to expand the existing knowledge on the Circular Leaf Spot Disease of rubber plantations and to develop effective disease management strategies to be implemented towards a sustainable rubber plantation industry.



Affected Areas

Severe Area	- 30%	Moderate Area	- 20%
Mild Area	– 30%	Disease free Area	- 20%

Affected Area – 15,000ha

(Survey Conducted in 2022- *Based on the data provided by the RDD & the RPCs*)

Assumption 30,000 ha - *Including a buffer zone*

Severe Area 30,000 x 30% = 9,000 ha

Only Hot spots have been considered = 5000 ha

Estimated expenditure = 125 Rs. Mn

(*Cost for three rounds of fungicide application = Rs. 25,000/=*)

It is estimated that approx. 30,000 ha are affected. From that 30% where the disease is severe warrants chemical controlling while all the other stakeholders should implement the national programme to their fullest in order to reduce the disease severity, the leaf fall condition, to avoid the die back condition and to reduce the crop loss.

Short term practices – To be implemented immediately

- Reduce the inoculum potential during the wintering and leaf falls due to the disease
- Collect all the leaves into a ditch in between the planting rows for composting
- Microbial consortium is recommended for antagonistic action and decomposing
- Weeding and improving the sanitation of the plantations
- Remove all the runts in plantations
- Fertilizer application as recommended - (chemical + organic)
- Avoid over exploitation
- Apply the fungicide where necessary (more than 60% leaf fall during Octo – Nov).
- Recommended fungicides - Carbendazim 10g / L & Hexaconazole 10ml / L
- Calibration of the sprayers
- Timing of the fungicide application is important

Mid-term practices

- Clearing the abandoned/neglected plantations
- Good Agricultural practices
- Regularize the tapping protocols
- Training programmes

Long term practices

- Use tolerant clones as much as possible
  RRIC100/ RRISL2006 / CEN 4
- Keep the clonal balance

Mature Plantations

Mature rubber plantations that have shown **more than 60%** leaf fall during the previous year, should be protected with three rounds of fungicide spraying

- ✓ **First fungicide application** – Just after the refoliation, when the plants show apple green stage leaves
- ✓ **Second fungicide application** – After all leaves have turned to semi-mature stage
- ✓ **Third fungicide application** – Can be delayed up to the stage-before the onset of the monsoon rains

Fungicide (commercial)	Dilution rate	Requirement/ha/ application (approx.)	Requirement/ha/ (approx.)
Carbendazim	10g/l	750 g (Capacity 15 L X 5 tanks)	1 kg 500 g (2 applications)
Hexaconazole	10ml/l	750 ml (Capacity 15 L X 5 tanks)	750ml (1 application)

Immature Rubber Plantations

Should be well looked after, in order to maintain their proper growth rates. They should be sprayed with either one of the above fungicides, if the plants show **more than 10%** leaf fall

Nursery Management

Carbendazim (50% WP) in 3g/l

Hexaconazole (50 g/l SC) in 3ml/l

- The frequency of application should be adjusted according to the weather condition and the severity of the disease
- In country quarantine programme should be carried out

INTERGRATED DISASE MANAGEMENT PLAN

Action	Activities to be undertaken	Details	Responsibility
Reduction of the inoculum potential	Collection of all the fallen leaves and debris in to ditches in between the rubber plant rows for composting	Especially for smallholder farmers	RDD RRISL RPCs
	Bio pesticide for destroying the pathogen & microbes for the acceleration of composting	RRISL will provide the microbe consortium to accelerate the decaying	RRISL RDD
Disease avoidance	Plant disease escaping rubber clones – RRIC 100 / RRISL 2006 / CEN 4	Recommendation and to provide the clones to RPCs	RRISL RDD
Removal of runts from the plantations	Removal of weak plants and plants beyond reaching the tappable level	Avoid points of inocula Lower the plant density to improve ventilation	RDD RPCs
Quarantine legislation Nurseries	Adoption of recommendations in transporting of planting materials to disease free areas	Removing & burning of infected leaves. Fungicide application before transportation	RRISL RDD
Recommended fertilizer application	Application of fertilizer to improve tree vigour / resilience to tolerate the disease	Promotion / popularization of RRISL recommendation	RDD RRISL
Management of weeds to avoid harbouring pathogens	Exclude weeds with pathogens Lower the humidity levels to suppress pathogens growth Improve ventilation and mange soil moisture level	Promotion / popularization of RRISL recommendation	RDD ASD
Disease Management - Chemical & Biological controlling	**<u>Chemical controlling</u>** Use of fungicides where more than 60% of leaf fall is observed For the disease hot spots For advancing margins	**Carbendazim 10g / L & Hexaconazole 10ml / L** Or any other test applications Continuation of the RRISL trials & implementation	RDD RRISL
	<u>Biological controlling</u> Under pilot scale trials	Continuation of the trials & implementation	RDD RRISL
Developing a surveying system - remote sensing to mark the disease hot spots -	Demarcation of disease hot spots / vulnerable areas / Mild or disease free areas Establishment of Geographical distribution of the disease Guide for a site specific chemical controlling programme	To be undertaken during the months of Sept – October	RRISL RDD RPCs

Screening of clones against the disease	Lab conditions Nursery conditions Natural field conditions	Identification of disease tolerant clones Eg. RRIC 100, RRISL 2006, CEN 4	RRISL
Breeding for resistance	Field programmes by the G&PB Dept Introduce more disease resistant / tolerant clones	To introduce more promising clones since a single clone currently occupy more than 75% showing a high crop risk	RRISL
Promotion of the clonal balance	Diversification of the clones will reduce the disease severity and the overall crop risk	To introduce recommended clones as much as possible	RRISL RDD RPCs
To establish the crop lose due to the disease	Field trials Currently the average crop lose due to the disease has been estimated as 0 - 10%	Further studies to be undertaken	RRISL RDD
Training of Extension staff / Technical staff	RDD / ASD / RPCs / Support from the PA / Summarizing the Google form / Weather factors	Regular training to train the trainers	RRISL RDD
Popularization of the activities	Posters / Leaflets / newspaper articles / video clips/ media conferences / training programmes / workshops	Awareness programmes for promotion of implementation at national level	RDD RRISL

ON - GOING RESEARCH PROGRAMME

- IMPROVEMENT OF A LONG-TERM MANAGEMENT PROTOCOL
- CHEMICAL / BIOLOGICAL / AGRONOMIC PRACTICES TO REDUCE THE INOCULUM POTENTIAL
- AGRONOMIC PRACTICES TO IMPROVE TREE RESILIENCE– GAP
- MEASURES TO INDUCE THE TREE RESISTANCE – SA / MORINGA
- SITE SPECIFIC PESTICIDE APPLICATIONS
- DOZES / TIMING OF PESTICIDE APPLICATION
- NEW PESTICIDE FORMULATIONS WATER / OIL BASED
- NEW APPLICATION TECHNIQUES
  MIST BLOWERS / DRONE / FOGGING MACHINES / SOIL DRENCHING
- BIOLOGICAL CONTROLLING METHODS
- CLONAL SCREENING
- BREEDING FOR RESISTANCE
- DESIGNING & MODIFICATION OF SPRAYING MACHINES

COLLABORATING ORGANIZATIONS / INSTITUTIONS

Ministry of Plantations
All the Research of RRISL
Rubber Development Department
Universities
Colombo / IBMBB / Ruhuna / Peradeniya / Sabaragamuwa / Rajarata / Eastern / Jayawardenapura