

**THANATEPHORUS CUCUMERIS, A PEST OF QUARANTINE IMPORTANCE TO ASIA INVADES SRI LANKAN RUBBER CULTIVATION**

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**ABSTRACT**

Target leaf spot caused by *Thanatephorus cucumeris* is a serious disease affecting rubber in Brazil and identified as a disease of quarantine importance to the rubber growing countries in South and South East Asia. This article reviews the diagnostic features of the disease and management strategies developed in Sri Lanka since its first detection in 1991.

**Key words:** diagnosis, *Hevea brasiliensis*, management, *Thanatephorus cucumeris*

Target leaf spot (TLS) is a serious leaf disease next in importance to South American Leaf Blight in the rubber growing areas of the Amazonian States of Brazil (Anon, 1996). TLS is considered as a pest of quarantine importance to South and South East Asian rubber growing countries and presently causes substantial loss of the rubber production only in South American region.

However, during the year 1991 *T. cucumeris* was found in seed germination beds for the first time in Sri Lanka (Jayasinghe, 1993). Subsequently the pathogen was detected in seedling nurseries in 1992 and was found on immature clearings overgrown with common creepers in 1993. Since then disease appears during prolonged gloomy wet weather especially in seedling nurseries resulting die-back of plants.

**Geographical distribution**

The disease was first detected in Peru, in 1948 (Lorenz, 1948). The other South American countries where the disease is endemic are Costa Rica (Carpenter & Langford, 1950), Brazil, Bolivia and Honduras (Stevenson & Carpenter, 1950). Though the occurrence of the disease has been reported from several Asian and African countries like Papua New Guinea (Anon, 1960), Ivory Coast (Boisson, 1966), Thailand (Pongthep *et al.*, 1980) and Sri Lanka (Jayasinghe, 1993a) the disease is confined to the nursery plants and rarely seen in immature clearings.

**The pathogen**

Basidiomycete fungus, *Thanatephorus cucumeris* (Frank) Donk (anamorph: *Rhizoctonia solani* Kühn) is responsible for the Target leaf spot disease. The pathogen was previously known as *Pellicularia filamentosa* (Pat).

## Disease spread

Basidiospores and pieces of hyphae dispersed by wind and rain are believed to be responsible for the disease dissemination. Crowded conditions, shade and overgrown weeds predispose the plants to infection. Common creepers in rubber plantations namely, *Pueraria phaseoloides* and *Mikania cordata* harbour the pathogen in Sri Lanka (Jayasinghe & Fernando, 1997).

## Diagnosis

The disease commonly occurs on stem, petioles and leaves of seedlings. The pathogen is also noticed on shoots, petioles and leaves of immature clearings (upto three years old) causing die-back of shoots if the plants are overgrown with creeping weeds (Fig. 1).

Initial symptoms appear on young leaves during prolonged wet weather as tiny circular spots, which later develop into irregular water, soaked patches. These lesions are much lighter in colour than the surrounding unaffected area and are translucent if viewed against the light. Another characteristic feature is the appearance of whitish latex exudates as tiny globules on new infection points which later turns to brownish black colour.

With the maturity of the leaves lesions increase in size, become dry and brittle covering an extensive area of the leaf blade. Sometimes interveinal destruction of chlorophyll and tissue takes place giving a web appearance to the lesion. Severely affected leaves fall off and cause the die-back of shoots and seedlings under adverse weather conditions.

Simultaneously light tan hyphae develop and net work of silvery mycelium appear covering the young stems, petioles and sometimes leaf blades. At many instances detached leaves could be seen hanging down from the mycelial threads.

Later, brownish minute sclerotia of the fungus develop adhering to the infected plant parts.

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**Fig. 1.** Target leaf spot (a) Tiny circular spots, initial symptom of the *Thanatephorus cucumeris* infection, (b) Latex exudates as whitish globules on new infection points, (c) Dry and brittle elongated lesions on mature leaves. Note the interveinal destruction of chlorophyll and tissue. (d) Translucent irregular patches on young leaves. (e) & (j) Advance stage of infection. Note the defoliation and hanging down of the detached leaves from the mycelial threads. (f) Immature clearing overgrown with common creepers like *Pueraria* and *Mikania*. These weeds predispose the field plants to infection. (g) Severe infection in seed germination bed resulting die-back of seedlings. (h) Network of silvery mycelium of *T. cucumeris* on stems, petioles and leaves of seedlings. (i) enlarged portion of an affected stem to show the light tan hyphae, (k) & (l) Disease symptoms on two alternate hosts in Sri Lanka, *Mikania* and *Pueraria* respectively.



### Disease management

Commonly occur in many clones in South American region, hence breeding for resistance is not practicable. Weekly spraying of fungicides namely benomyl, mancozeb and triademefon is recommended in Brazil (Anon, 1996).

It was shown in Sri Lanka that target leaf spot disease could be easily prevented by merely adhering to correct cultural practices during establishment and maintenance of nurseries (Jayasinghe, 1998). Remove the germinated seeds (at the hypocotyl stage) from the seed germination beds and transplant them in beds prepared for seedling nurseries as soon as possible. If the germinated seeds are kept in the seed germination beds for months, the crowded conditions and high humidity predispose the plants to TLS. Regular weeding of the nurseries and immature clearings is essential as overgrown creepers also predispose the plants to TLS. These creepers harbour the pathogen and are responsible for the spread of the disease in nurseries and immature fields.

Effective chemical control measures are also available in case of sudden outbreaks. Recommended fungicides in Sri Lanka are benomyl and pencycuron (Jayasinghe *et al.*, 1997).

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