

# 1. PaDIL Species Factsheet



## Scientific Name:

*Sugarcane white leaf Phytoplasma* -  
(Phytoplasma)

## Common Name

White leaf disease of sugarcane

Live link: <http://www.padil.gov.au:80/pests-and-diseases/Pest/Main/136665>

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Department of Agriculture, Fisheries and Forestry

<http://www.daff.gov.au/>



Department of Agriculture and Food, Western Australia

<http://www.agric.wa.gov.au/>

## 2. Species Information

### 2.1. Details

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**Author:** Liberato JR, Sakuanrungrsirikul S, Sdoodee R & Charaensatapon R

**Citation:** Liberato JR, Sakuanrungrsirikul S, Sdoodee R & Charaensatapon R (2006) White leaf disease of sugarcane (*Sugarcane white leaf Phytoplasma*) Updated on 7/23/2016 Available online: PaDIL - <http://www.padil.gov.au>

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### 2.2. URL

Live link: <http://www.padil.gov.au:80/pests-and-diseases/Pest/Main/136665>

### 2.3. Facets

**Status:** Exotic Regulated Pest - absent from Australia

**Group:** Phytoplasmas

**Commodity Overview:** Field Crops and Pastures

**Commodity Type:** Sugarcane

**Distribution:** Africa, South and South-East Asia

### 2.4. Diagnostic Notes

#### Symptoms

Initially, a single white or cream line parallel to the midrib occurs, which can be seen from either side of the blade. Later, several straight white to light green to yellow stripes develops parallel to the midrib developing extending along the entire leaf length, but rarely onto the upper portion of the leaf sheath. The stripe width ranges from narrow pin stripe to as broad as the leaf. A mottled pattern of normal or light green dot, spot, streak or patch islands may develop on a white background, varying in size and shape. If there are many green islands, the leaves will look green. As the disease develops, the plant vigour decreases. Other symptoms are stunted stalks, absence of side shoots on the upper part of infected stalks and abnormal tillering (Ling 1962).

#### The pathogen:

Pleomorphic Phytoplasma bodies have been observed in sieve tube elements of infected sugarcane. They vary in size from 80 to 800 nm, do not have a wall cell and their membrane is approximately 10 nm thick (Maramorosch et al. 1975).

The disease can be detected by PCR-based methods (Wongkaew et al. 1997). Detection of Phytoplasma infection can be accomplished in crude tissue extracts by serological methods (ELISA) (Sarindu & Clark 1993).

According to Ritthinson (2004), the 210 bp phytoplasma DNA fragment associated with sugarcane white leaf disease was detected in 12 out of 69 species of leafhoppers: *Baclutha rubrostriata*, *Baclutha* sp., *Bhatia olivacea*, *Exitianus indicus*, *Macrosteles strifrons*, *Matsumuratettix hiroglyphicus*, *Recilia* sp., *Recilia*

distinctus, *Recilia dorsalis*, *Thaia oryzivora*, *Xestocephalus* sp. and *Yamatotettix flavovittatus*.

*Matsumuratettix hiroglyphicus* and *Y. flavovittatus* are able to transmit the disease to healthy plants (Chen 1978, Ritthinson 2004).

## 2.5. References

CABI/EPPO, 2000. Sugarcane white leaf phytoplasma. Distribution Maps of Plant Diseases, Map No. 807. Wallingford, UK: CAB International. Chen CT (1978). Vector-pathogen relationships of sugarcane white leaf disease. *Taiwan Sugar*, 25(2):50-54. Chen CT & Kusalwong (2000) White leaf. In Rott P, Bailey RA, Comstock JC, Croft BJ & Saumtally AS (eds). A guide to sugarcane diseases. CIRAD / ISSCT. P. 231-236. Crop Protection Compendium 2005 Edition. Sugarcane white leaf phytoplasma. CAB International, Wallingford, UK. Ling KC (1962) White leaf disease of sugarcane. *Taiwan Sugar* 9: 28-32. Maramorosch K, Kimura M, Chareonridhi S (1975) Mycoplasma-like organisms associated with white leaf disease of sugarcane in Thailand. *FAO Plant Protection Bulletin* 23:137-139. Ministry of Agriculture and Co-operative, Department of Agriculture, Plant Protection Research and Development office (2002). Manual of field crop diseases. Bangkok. 106p. Rishi N & Chen CT (1989) Grassy shoot and white leaf diseases. In: Ricaud BC, Egan BT, Gillaspie Jr AG & Hughes CG (eds.) Diseases of Sugarcane. Major diseases. Amsterdam, The Netherlands: Elsevier, p. 289-300. Ritthison W (2004) Molecular detection and transmission of Phytoplasma associated with sugarcane white leaf disease in insect vectors. Master of Science thesis in entomology, Graduate School, Khon Kaen University, Khon kaen, Thailand. Sakuanrungsirikul S, Sansayavichai T, Phonpakdee V, Seesink S (2006) Survey of sugarcane tolerant to whiteleaf disease. Khon Kaen Field Crop Research Center, Annual Report 2006. Department of Agriculture, Thailand. Sarindu N & Clark MF (1993) Antibody production and identity of MLOs associated with sugar-cane whiteleaf disease and bermuda-grass whiteleaf disease from Thailand. *Plant Pathology* 42:396-402. Wongkaew P (1999) Sugarcane white leaf disease management. Faculty of Agriculture, Khon Kaen University, Khon Kaen Pim Pattana Ltd., Khon Kaen, Thailand. 219 pp. Wongkaew P, Hanboonsong Y, Sirithorn P, Choosai C, Boonkrong S, Tinnangwattana T, Kitchareonpanya R & Damak S (1997). Differentiation of phytoplasmas associated with sugarcane and gramineous weed white leaf disease and sugarcane grassy shoot disease by RFLP and sequencing. *Theoretical and Applied Genetics* 95: 660-663.

### 3. Diagnostic Images



Symptoms of white leaf disease of sugarcane (For permission to reproduce image email ponragdee@kknet.co.th).  
**Host Symptoms:** Weerapol Ponragdee  
Department of Agriculture, Thailand



Symptoms of white leaf disease of sugarcane (For permission to reproduce image email ponragdee@kknet.co.th).  
**Host Symptoms:** Weerapol Ponragdee  
Department of Agriculture, Thailand



Infected sugarcane plant (For permission to reproduce image email ratana.sd@psu.ac.th).  
**Host symptoms - leaves:** Dr Ratana Sdoodee Prince of Songkla University



Symptoms on leaves (For permission to reproduce image email rungsi@doa.go.th).  
**Host symptoms - leaves:** Rungsi Charaensatapon (Ministry of Agriculture and Co-operative 2002) Department of Agriculture, Thailand



Symptoms on leaves.  
**Host symptoms - leaves:** J.R. Liberato  
DPI&F



Symptoms on leaves.  
**Host symptoms - leaves:** J.R. Liberato  
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