1. PaDIL Species Factsheet

Scientific Name:
*Verticillium dahliae* Kleb.
Anamorphic fungi

Common Name
Verticillium wilt of cotton

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- Plant Health Australia

- Department of Agriculture, Fisheries and Forestry

- Department of Agriculture and Food, Western Australia
2. Species Information

2.1. Details

**Specimen Contact:** Dr Jose R. Liberato - jose.liberato@nt.gov.au  
**Author:** Liberato JR & Miles AK  
**Citation:** Liberato JR & Miles AK (2006) Verticillium wilt of cotton (*Verticillium dahliae*) Updated on 7/23/2016  
**Available online:** PaDIL - http://www.padil.gov.au  
**Image Use:** Free for use under the Creative Commons Attribution 3.0 Australia licence

2.2. URL

**Live link:** http://www.padil.gov.au:80/pests-and-diseases/Pest/Main/136633

2.3. Facets

**Status:** Exotic Regulated Pest - absent from Australia  
**Group:** Fungi  
**Commodity Overview:** Field Crops and Pastures  
**Commodity Type:** Cotton & other fibres  
**Distribution:** Cosmopolitan

2.4. Other Names

*Verticillium albo-atrum* auct. pro parte  
*Verticillium albo-atrum* var. *medium* Wollenw.  
*Verticillium dahliae* var. *longisporum* Stark  
*Verticillium ovatum* G.H. Berk. & A.B. Jacks.

2.5. Diagnostic Notes

**Symptoms**

On cotton, strains of *Verticillium dahliae* have been classified into two pathotypes: defoliating (D) strains, which are highly virulent and can completely defoliate the plant; and nondefoliating (ND) strains, which are mildly virulent and can only cause wilt and partial or no defoliation (Schnathorst & Mathre 1966).

ND strains usually induce a non-lethal chronic condition on cotton plants. Symptoms usually appear 5-6 weeks after emergence as interveinal and marginal chlorosis on the first leaf, which become necrotic. Later this symptom spreads up the plant. Moderate epinasty occurs and the plant may die. D strains lead to a rapid downcurling of the terminal leaf and cause severe epinasty, general chlorosis with slight to extensive vascular discoloration in stems, which is followed by sudden and almost total defoliation and abscission of bolls (Schnathorst & Mathre 1966, Pegg & Brady 2002).

The fungus:

Conidiophores ± erect, hyaline, verticillately branched, septate, 80-160 μm long, 3-5 μm at the base, seldom with secondary branches, bearing 1-2(-3) whorls 30-40 μm apart, containing (1-)3-4(-5) phialides per whorl. Phialides straight to slightly curved, mainly 16-35 x 1-2.5 μm, terminal phialide 30-44 μm long. Phialides frequently arise directly from hyphae. Conidia borne singly at the apices of the phialides and often aggregated.
in heads, hyaline, elliptical to sub-cylindrical, mainly aseptate, 2.5-8 x 1.4-3.2 µm in var. dahliae. Microsclerotia dark brown to black, abundant, thick-walled, mostly 30-60 µm in diameter, consisting of swollen almost globular cells (Smith 1965, Hawksworth & Talboys 1970).

Notes:

1. D strains have limited pathogenicity to other common hosts of V. dahliae (Crop protection Compendium 2005).

2. D and ND strains can be distinguished by PCR-based detection methods (Pérez-Artés et al. 2000, 2005).

3. Verticillium dahliae may be distinguished from V. albo-atrum by the presence of true microsclerotia forming colonies (Hawksworth & Talboys 1970). Until the 1970s some plant pathologists considered V. dahliae to be synonymous with V. albo-atrum, and many publications about Verticillium wilt of cotton refer to V. albo-atrum (or the microsclerotial form of V. albo-atrum) (Crop Protection Compendium 2005).

4. D strains belong to vegetative compatibility group VCG 1A, whereas ND strains belong to VCG 1B, 2A, 2B, 3, 4A, 4A/B and 4b (Bell 2001).

2.6. References

3. Diagnostic Images

Chlorosis on leaves (Used with permission from University of California Statewide IPM Program. Copyright, for use see http://www.ipm.ucdavis.edu/GENERAL/copyright.html).

**Host Symptoms:** Jack Kelly Clark University of California

Interveinal chlorosis on leaves (copyright, for use contact email address).

**Host symptoms - leaves:** DPI&F Archives DPI&F

Interveinal chlorosis on leaves (copyright, for use contact email address).

**Host symptoms - leaves:** DPI&F Archives DPI&F

Vascular discoloration (Used with permission from University of California Statewide IPM Program. Copyright, for use see http://www.ipm.ucdavis.edu/GENERAL/copyright.html).

**Host symptoms - stem:** Jack Kelly Clark University of California

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