

### Management options for Verticillium wilt

- Identification of fields infested with *V. dahliae* (sample stems (Fig. 2d))
- Quantification of inoculum density in the soil to categorize risk within a field
- Results from soil assays will determine population of fungus in soil
- Contact your local Extension office for information regarding soil assays (sampling techniques, times, cost, etc.)
- Management options depend on level of risk and may require integration of several factors
- Seeding rates of at least 4 seed per foot will minimize losses
- Do not over-water in July or August (excessive water favors disease development)
- Rotation with a grain crop may be beneficial in low risk situations
- Use partially resistant/tolerant varieties

[lubbock.tamu.edu/cotton/pdf/2009VERTICILLIUM.pdf](http://lubbock.tamu.edu/cotton/pdf/2009VERTICILLIUM.pdf)

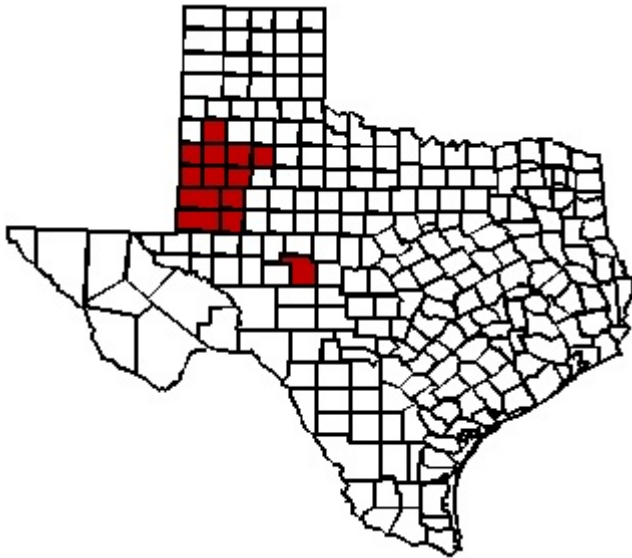


Figure 3. Counties in the Southern High Plains with fields known to be infested with *Fusarium oxysporum* f. sp. *vasinfectum*.

The information given herein is for educational purposes only. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by Texas AgriLife Extension Service, Texas AgriLife Research and the Texas A&M System is implied.

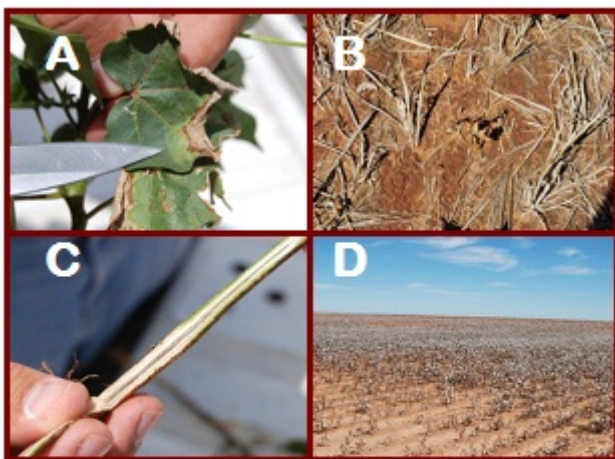


### Diagnosis and Management of Vascular Wilts in Cotton

by Jason E. Woodward,  
Extension Plant Pathologist



Vascular wilts, such as Fusarium wilt and Verticillium wilt, are capable of significantly reducing cotton yields, and negatively impacting fiber quality. Properly diagnosing these diseases is critical in developing a management system. While subtle differences can be observed in the field, laboratory examinations are often required to differentiate the two diseases. Variety selection is the most effective factor in reducing wilt-associated losses. Studies evaluating the performance of commercially available cotton varieties have led to guidelines that can be used in selecting varieties to be planted in fields with a history of Fusarium and/or Verticillium wilt. The purpose of this brochure is to improve on the diagnosis of vascular wilts, and help identify varieties suitable for planting in problem fields.



**Figure 1.** a) Foliar and wilt symptoms of plants with Fusarium wilt; b) mortality of young plant infected with Fusarium wilt; c) brown vascular discoloration of plant with Fusarium wilt; and d) severe Fusarium wilt in a field heavily infested with *Fusarium oxysporum* f. sp. *vasinfectum*

## Fusarium wilt

Causal agent: *Fusarium oxysporum* f. sp. *vasinfectum* (*Fov*)

Disease development depends on:

**Host:** susceptibility

**Pathogen:** inoculum density, infection by *Fov* is dependant upon the root-knot nematode

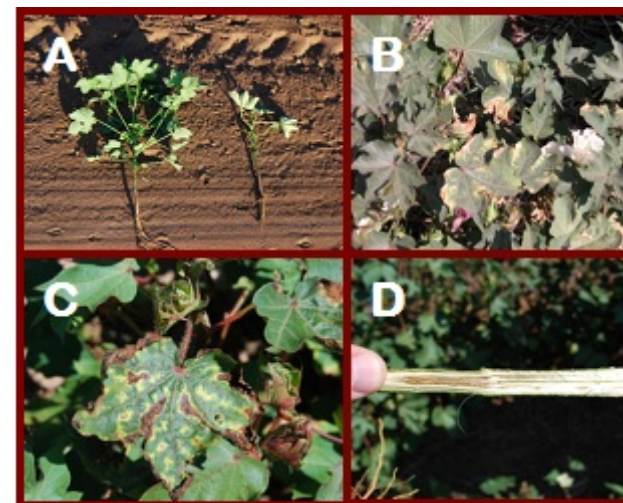
**Environment:** warmer temperatures and sandy soils

- Symptoms can occur throughout the growing season
- Initial symptoms consist of chlorosis and wilting on the margin of the leaf (Fig. 1a)
- Infected seedlings often die (Fig. 1b), and may be confused with seedling disease
- Diseased plants exhibit a continuous discoloration of the vascular tissue (Fig. 1c)
- Diseased areas in the field occur in circular patches (Fig. 1d), with reduced stands and poor vigor
- While the potential for Fusarium wilt to occur exists wherever root-knot nematodes are established, the current distribution of *Fov* is limited primarily to areas south and west of Lubbock (Fig. 3)

## Management options for Fusarium wilt

- Proper identification of Fusarium wilt fields is required
- Sample infected plants for presence of *Fov*
- Assay soil for root-knot nematodes
- Nematode risk level will influence management options
- Contact your local Extension office for information regarding nematode assays (sampling techniques, time, handling, cost, etc.)
- Use of nematicides will indirectly leads to less Fusarium wilt damage
- Rotation with peanut will not affect populations of *Fov*, but can negatively impact nematode populations
- Field observations indicate that using partially resistant cultivars for several seasons can reduce Fusarium wilt severity in subsequent years
- No immune varieties exist; however, several commercially available varieties have performed consistently well in University trials
- Review annual Fusarium wilt research results for more details

[lubbock.tamu.edu/cotton/pdf/2009FUSARIUM.pdf](http://lubbock.tamu.edu/cotton/pdf/2009FUSARIUM.pdf)



**Figure 2.** a) Stunting and premature defoliation of plants infected with Verticillium wilt; b) initial symptoms of Verticillium wilt; c) interveinal chlorosis and necrosis of leaves from plants infected with Verticillium wilt; and d) dark brown (continuous) streaks in the stem of a plant infected with Verticillium wilt.

## Verticillium wilt

Causal agent: *Verticillium dahliae*

Disease development depends on:

**Host:** variety, developmental stage, and plant density

**Pathogen:** defoliating vs. non-defoliating type, aggressiveness, and inoculum density

**Environment:** cool, wet condition

- Initial root infections occur early in the season; however, symptoms are more evident post-bloom
- Infected plants may be wilted or stunted (Fig. 2a)
- Chlorosis or necrosis of leaf margins and interveinal areas may be observed (Fig. 2b,c)
- Light to dark brown discoloration (speckled) is prominent in the vascular system (Fig. 2d)
- Severe defoliation (Fig. 2a) can result, leading to reductions in yield and fiber quality
- *Verticillium dahliae* is widely distributed throughout the High Plains