



**PEST ASSESSMENT: Sweet Orange Scab, *Elsinoe australis* (Bitancourt & Jenk),
(Myriangiales: Elsinoaceae)**

USDA-APHIS-PPQ-CPHST-PERAL/ NCSU



Scientific name: *Elsinoe australis*

Taxonomic Position:

Order: Myriangiales

Family: Elsinoaceae

Common names: Sweet orange scab

Source: Sivanensen, A., and Critchett, C. 1974.

Photos courtesy of L.W. Timmer



Description:

Elsinoe australis is a fungal disease that causes cosmetic disfigurements of the fruit surface and therefore generally affects fresh market production. A closely related pathogen, *E. fawcettii*, causes leaf distortion through the formation of scab pustules on a susceptible cultivar's rootstock seedlings. Fruit infected with scab lesions have a reduced fresh-market value, increases the handling costs, and affects the marketable quantity available for fresh-market sale (Whiteside *et al.*, 1988).

Life History:

E. australis infects *Citrus* spp. including sweet orange (*C. sinensis*), lemon (*C. limon*), mandarin (*C. reticulata*), tangerine (*C. reticulata*) satsuma orange (*C. reticulata*), kumquat (*Fortunella margarita*), lime (*C. latifolia*), grapefruit (*C. paradisi*) and pointed leaf papeda (*C. hystrix*) (Smith *et al.*, 1992).

The fungus over-winters on the tree canopy primarily on the fruit and is rarely observed on the leaves. Its survival depends on the ability of existing scab pustules to retain their infectious propagules, wind borne ascospores or water liberated and dispersed conidia (Smith *et al.*, 1992). Germination of conidia can occur between 13-32 C, however infection has only been shown to occur at temperatures between 14-25 C (Timmer, 1996). Optimum temperature for infection appears to be between 24-29 C (Bitancourt and Jenkins, 1937). A minimum wet period provided through dew, fog, or other high moisture conditions (not necessarily free water) of 2.5-3.5 hours is required for conidial infection (Smith *et al.*, 1992).

Comparison to native pests with similar biology:

Whiteside has suggested that *E. australis* may not be a valid taxon and that fruit infection of sweet orange in South America may be attributable to the Florida Broad Host Range (FBHR) biotype of *E. fawcetti*. *E. fawcettii*, is present in the US in Florida and Texas and causes leaf distortion through the formation of scab pustules on susceptible cultivars rootstock seedlings.

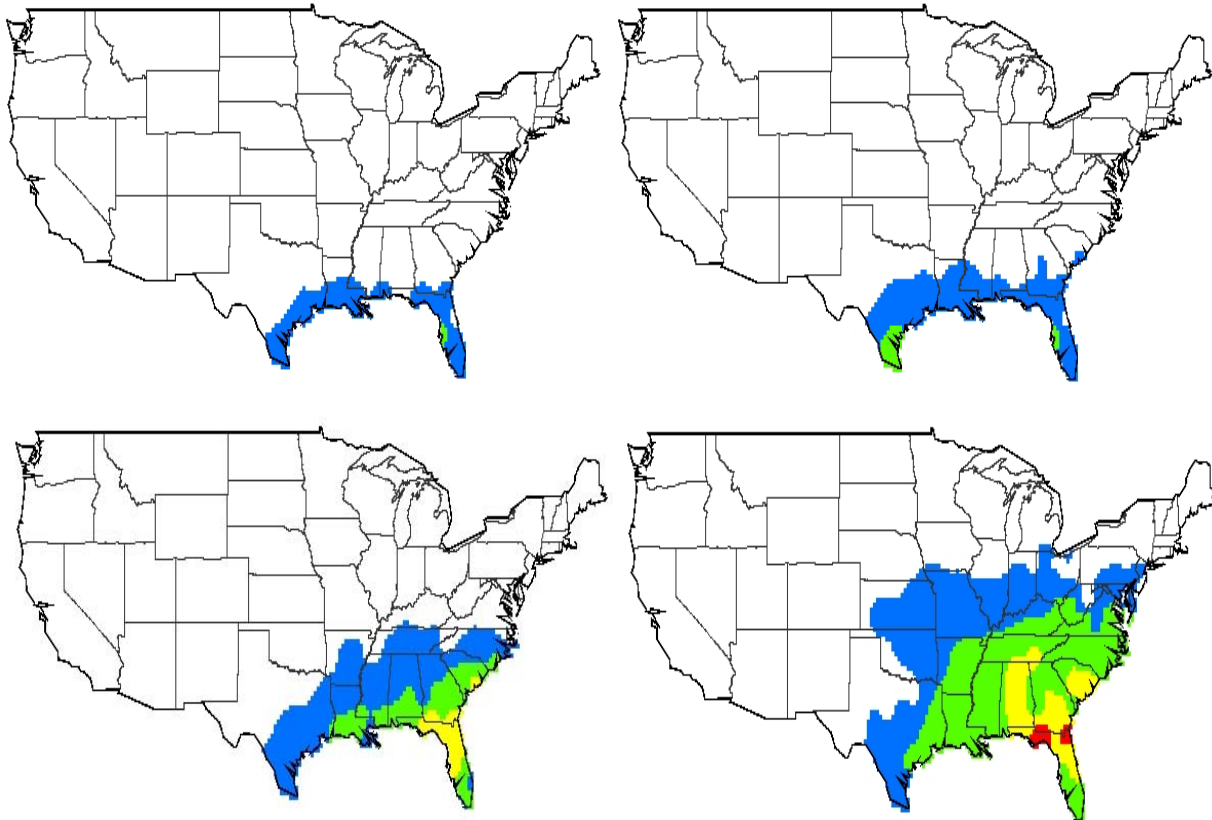


Figure 2. Probability maps of *E. australis* infection during the periods of February 15, March 15, April 15 and May 15 (A-D), respectively, represented by frequency of occurrence in ten years. Maps based upon 30-year climatic averages.

Projected distribution in the United States if Introduced:

In areas with limited annual rainfall (less than 1300 mm) warm temperatures (mean monthly temperature above 24 degrees C and dry climates (states of Arizona and California) this disease would not become established, and even if present, would be unimportant (Smith *et al.* 1992). Conditions are likely to be conducive in the humid Southeast, particularly Florida because the climate is consistent with the requirements of the fungal pathogen.

Prediction Model:

The Generic Infection Template was used to create a model of the pathogen. The pathogen requires moderately warm temperatures (4-25°C) and a minimum wet period of 2.5-3.5 for infections to occur. The model assumes presence of inoculum. The recommendations for infection model parameters for *E. australis* are T_{\min} 14 C, T_{\max} 29 C, T_{opt} = 24, W_{\min} 2.5 h.



Figure 3. Counties in the United States where greater than 1,000 acres of citrus are grown. (Census of Agriculture 1997)



Figure 4. Areas of the continental United States where greater than 1,000 acres of citrus are grown and infection risk > 3 years out of 10 on May 15. Maps based upon 30-year climatic averages.

Conditions for fruit infection of *E. australis* would be conducive in the humid Southeast, particularly Florida and parts of Texas because the climate in those areas is consistent with the criminological requirements of the fungal pathogen. “If airborne ascospores are produced commonly on fruit by this species, then introduction of infected fruit may constitute a significant risk” (Timmer 1996).

Acknowledgements:

Authors:

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