

**PROGRESS REPORTS ON**  
**PROJECT FUNDED BY THE SOUTHERN REGION SMALL FRUIT**  
**CONSORTIUM FOR 2012**

**Title:** Evaluation of *Fusarium* crown rot of strawberry

**Progress Report.**

**Grant Code:**SRSFC Project # SRSFC 2012-13

**Research Proposal**

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**Objective:** Determine the role of novel *Fusarium* strains in plant death and wilt.

**Justification: *Fusarium* crown rot.** *Fusarium* crown rot severity is on the rise and has become a serious problem in California and other strawberry growing regions. A survey conducted on strawberry root and crown diseases in 2005-2006 in Australia indicated that *Fusarium oxysporum* f.sp. *fragariae* was the predominant cause of wilting of plants in the fruiting field (Golzar et al. 2007). Koike et al. (2009) reported the involvement of *F. oxysporum* with plant wilting in California. In the NCSU plant disease and insect clinic, we have isolated *Fusarium* from discolored crowns of wilted plants and saved them although pathogenicity trials of these isolates were not conducted. We encountered this problem occasionally to date. We isolated *Fusarium* cultures from these crowns and are seriously concerned that it may be the highly specialized strawberry pathogen. A recent publication was published by our colleagues in SC with a similar type of problem (Williamson et al. 2012).

References:

- Golzar, H., Phillips, D. and S. Mack. 2007. Occurrence of strawberry root and crown rot in Western Australia. Australasian Plant Disease Notes 2: 145–147.  
[http://www.publish.csiro.au/?act=view\\_file&file\\_id=DN07057.pdf](http://www.publish.csiro.au/?act=view_file&file_id=DN07057.pdf)
- Koike, S. T., Kirkpatrick, S. C., and Gordon, T. R. 2009. *Fusarium* wilt of strawberry caused by *Fusarium oxysporum* in California. Plant Disease 93:1077.
- Williamson, M., D. Fernandez-Ortuno and G. Schnabel. 2012. First report of *Fusarium* wilt of strawberry caused by *Fusarium oxysporum* in South Carolina. Plant Disease 96:911.

**Methodologies:** Isolates were obtained in pure culture and single spore colonies obtained. Morphological features were assessed on semi-selective media and pathogenicity assays were performed in greenhouse pot assays. Conidial suspensions were drenched into soils containing established strawberry plants (Chandler) and re-isolations attempted from inoculated and/or symptomatic plants.

**Results:** Colonies with morphological features (color, microconidia size, macroconidia size) consistent of *Fusarium oxysporum* were isolated from discolored crown tissue. Inoculation assays resulted in wilted plants and the pathogen was successfully re-isolated from the wilted plants. The Koch postulates experiment was done twice.

**Conclusions:** Based on these assays, it appears the *Fusarium* wilt pathogen has been introduced into our region, and as reported by Williamson et al. 2012. We have not seen it frequently and cannot associate it with a plant source based on data to date. However, this work highlights that *Fusarium* may be present and we presume it is *Fusarium oxysporum* f.sp. *fragariae* but this would require more detailed molecular analysis.

**Impact Statement:** If this is indeed *Fusarium oxysporum* f.sp. *fragariae*, it can pose a serious threat to the industry. The pathogen can persist in soils for year, is not easy to fumigate in terms of eradication and aggressively kills plants. Two independent reports demonstrate we need to be vigilantly monitor for the pathogen and prevent imported plants from infested regions of production. We plan to do more molecular work with strains from CA to verify the identity of the pathogen.