

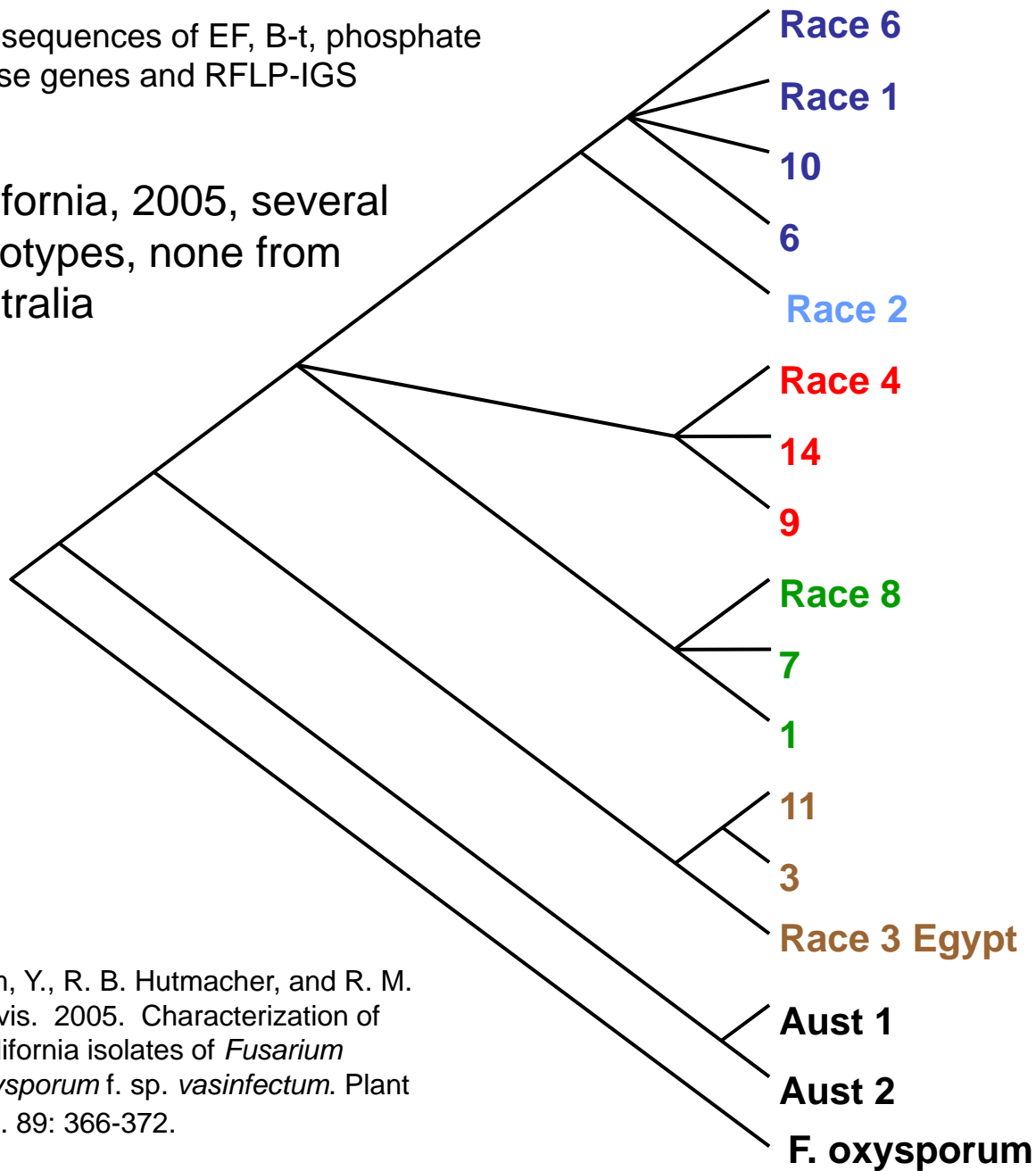
Genotypes of FOV – Virulence and Classification

R. M. Davis, Plant Pathology, UC Davis



partial sequences of EF, B-t, phosphate
permase genes and RFLP-IGS

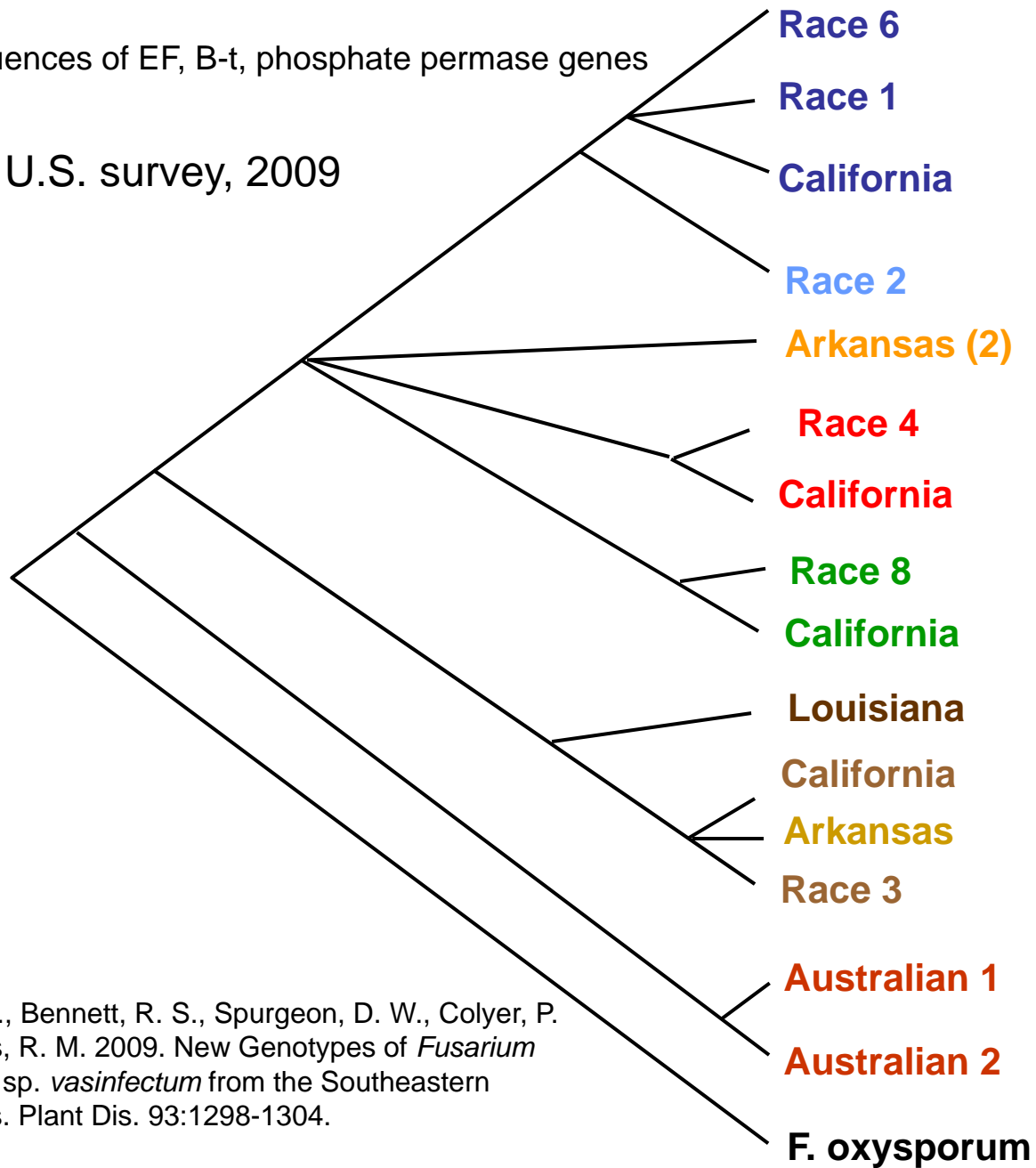
California, 2005, several
genotypes, none from
Australia



Kim, Y., R. B. Hutmacher, and R. M.
Davis. 2005. Characterization of
California isolates of *Fusarium*
oxysporum f. sp. *vasinfectum*. Plant
Dis. 89: 366-372.

partial sequences of EF, B-t, phosphate permase genes

Partial U.S. survey, 2009



Holmes, E. A., Bennett, R. S., Spurgeon, D. W., Colyer, P. D., and Davis, R. M. 2009. New Genotypes of *Fusarium oxysporum* f. sp. *vasinfectum* from the Southeastern United States. Plant Dis. 93:1298-1304.

| Isolate | Cultivar | | | | | |
|---------|----------|-------|-------|-----|-----|------|
| | Ph72 | DP744 | Ph800 | 445 | 480 | 4357 |
| LA 108 | +++ | ++ | + | +++ | +++ | ++ |
| LA 112 | -- | -- | + | -- | -- | -- |
| LA 140 | ++ | + | -- | + | ++ | + |
| Race 1 | ++ | ++ | + | +++ | +++ | +++ |
| Race 3 | + | -- | -- | -- | -- | -- |
| Race 4 | ++ | +++ | -- | + | ++ | + |
| Race 8 | ++ | + | + | ++ | ++ | ++ |

Holmes, E. A., Bennett, R. S., Spurgeon, D. W., Colyer, P. D., and Davis, R. M. 2009. New Genotypes of *Fusarium oxysporum* f. sp. *vasinfectum* from the Southeastern United States. Plant Dis. 93:1298-1304.



Phytogen 72



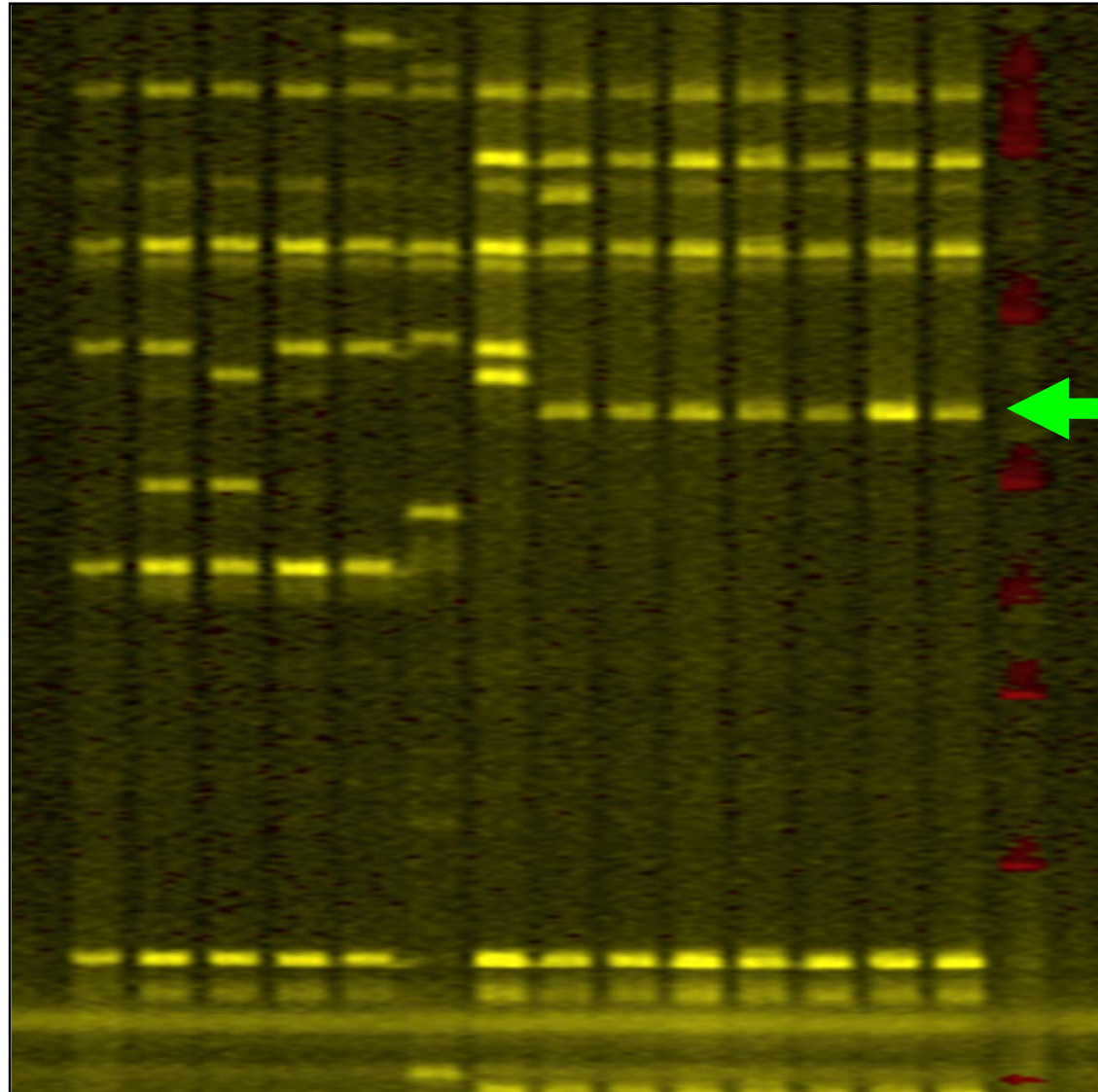
Pima 744

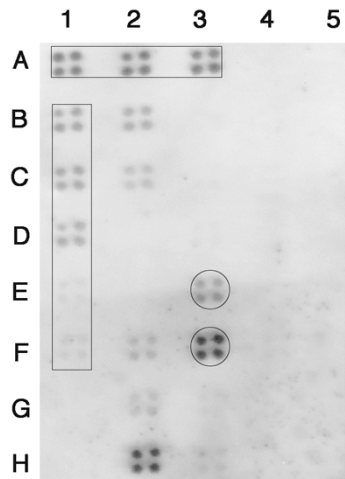
Davis, R. M., P. D. Colyer, C. S. Rothrock, and J. K. Kochman. 2006. Fusarium Wilt of Cotton: Population Diversity and Implications for Management. *Plant Disease* 90: 692-703.



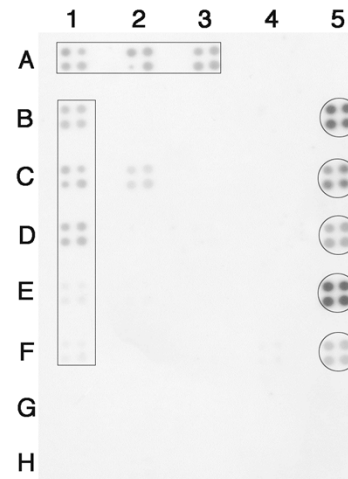
Phytogen 72

Race 1 1 1 2 3 6 8 4 4 4 4 4 4 4

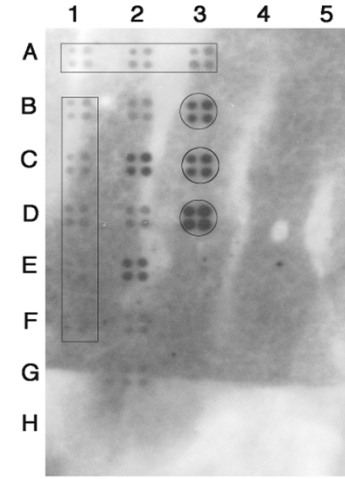




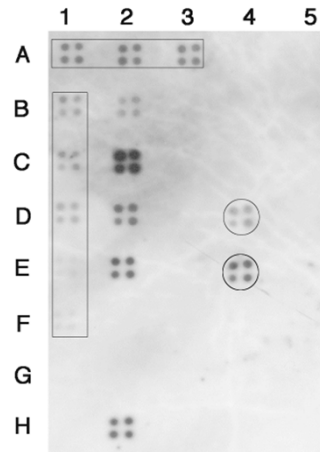
Australian race



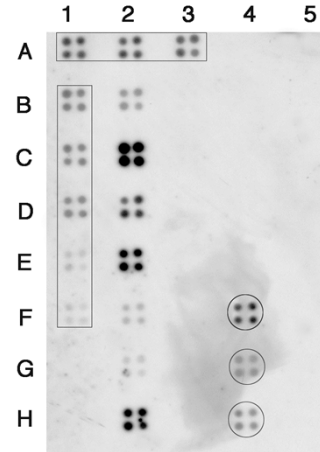
Race 1



Race 3



Race 4



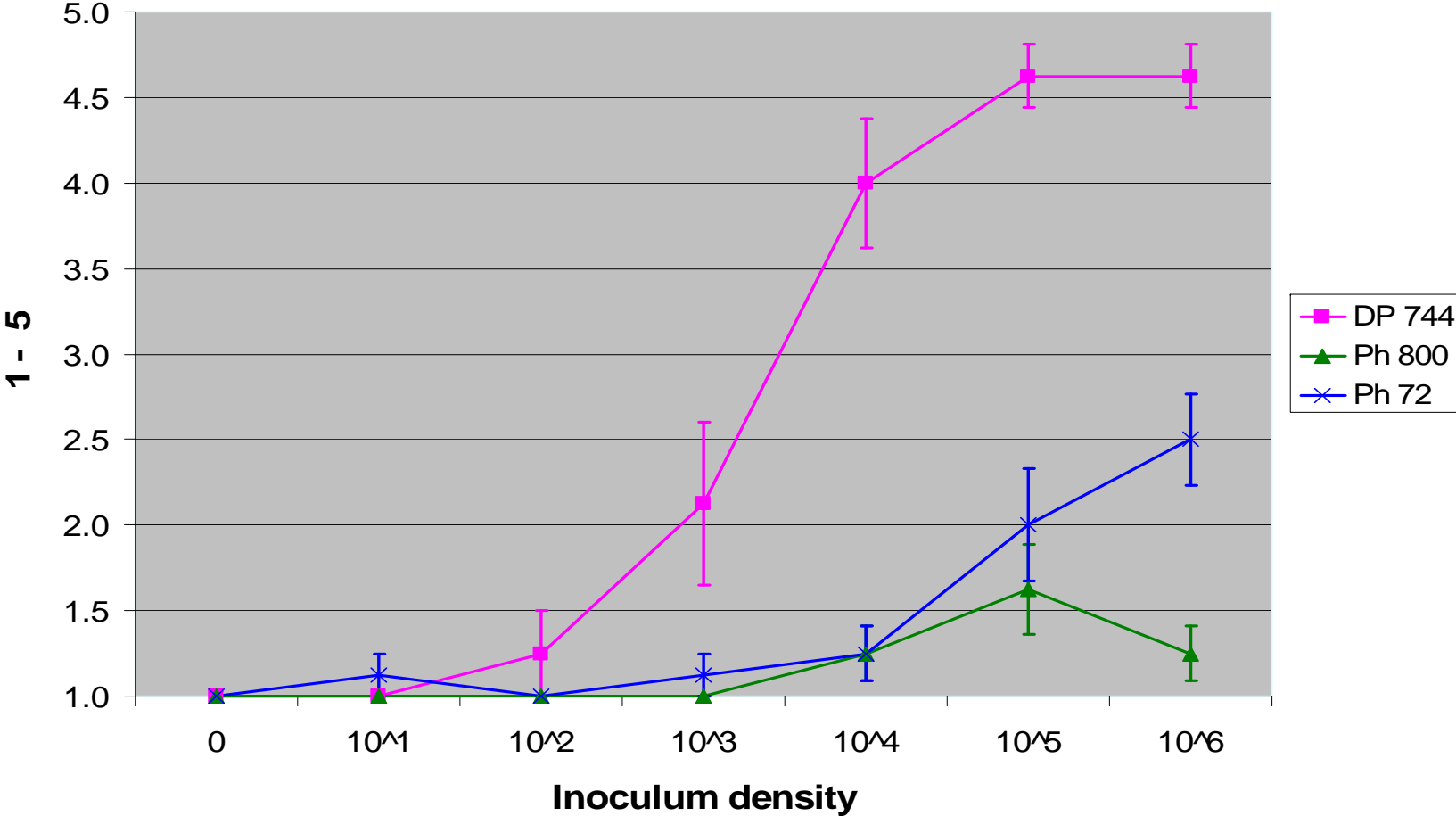
Race 8

FOV macroarray.
Positive controls in
rectangles; race-
specific probes in
circles

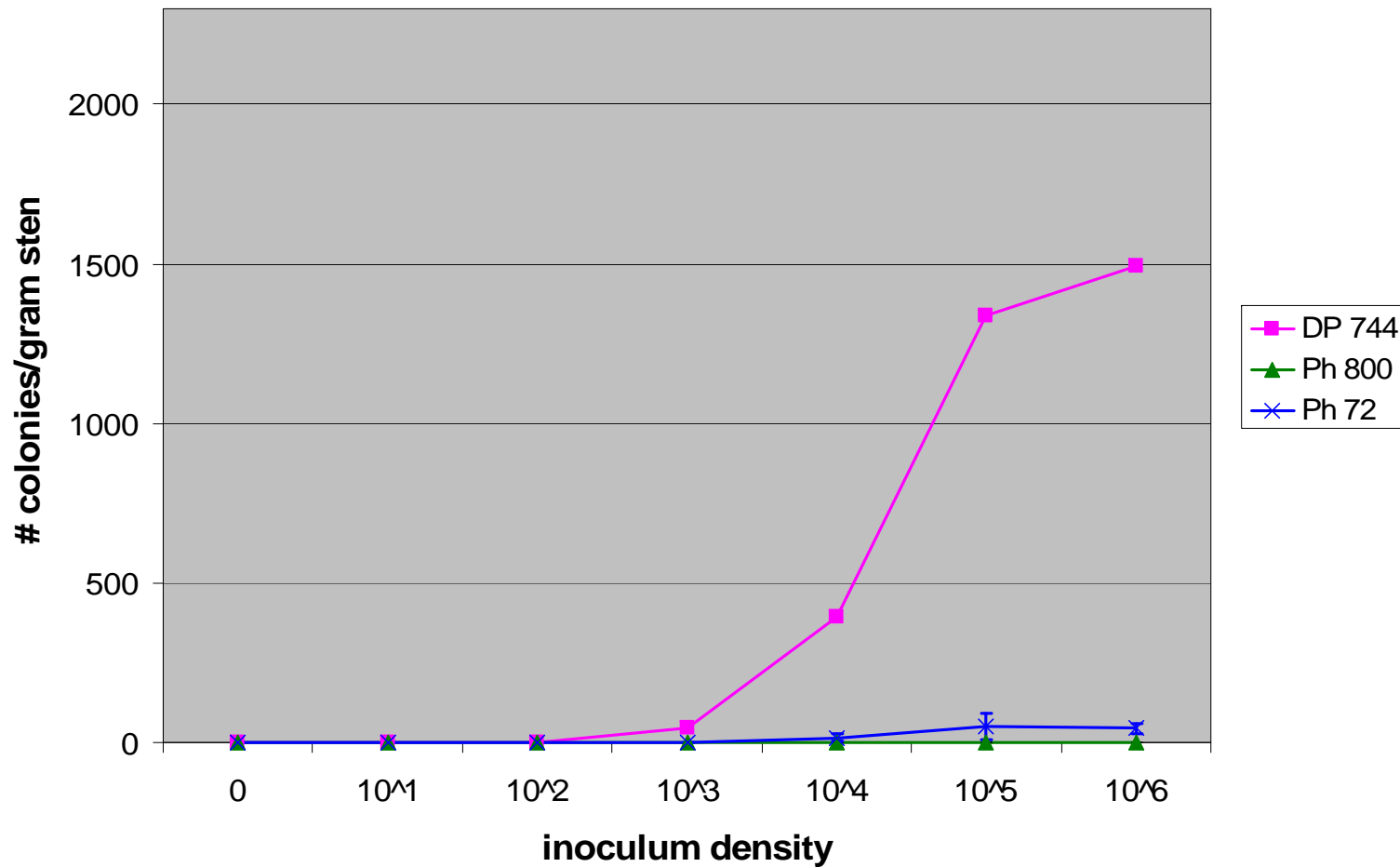
Gilbert, C. A., Zhang, N.,
Hutmacher, R. B., Davis, R.
M., and Smart, C. D. 2008.
Development of a DNA-based
macroarray for the detection
and identification of *Fusarium
oxysporum* f. sp. *vasinfectum*
in cotton tissue. *J. Cotton Sci*
12:165-170.



Symptoms



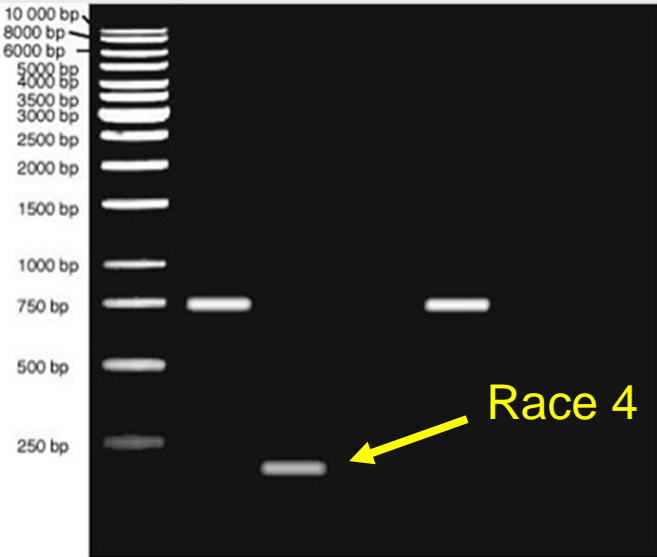
Colonies recovered per gram of stem tissue



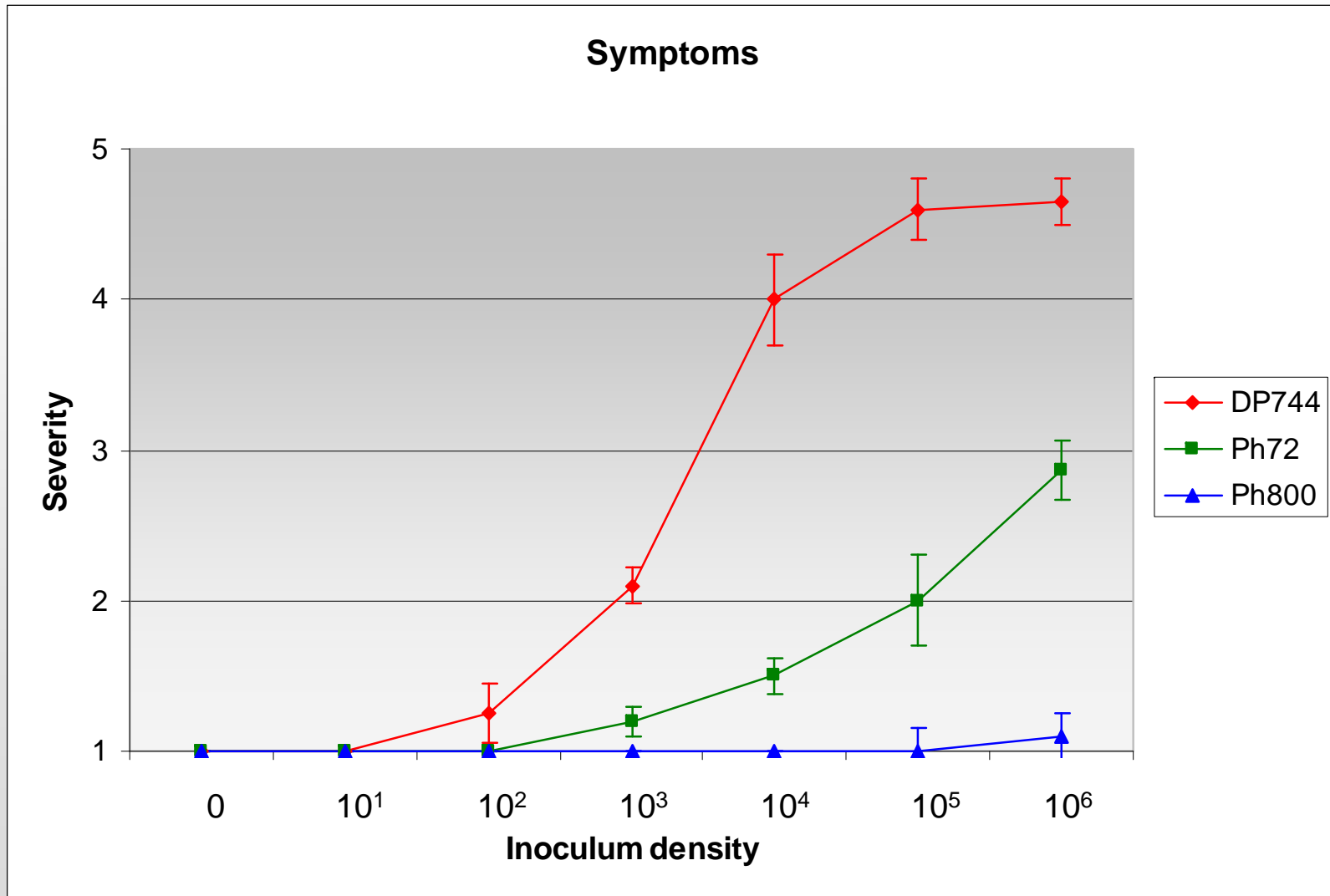
Bennett, R. S., Hutmacher, R. B., and Davis, R. M. 2008. Seed Transmission of *Fusarium oxysporum* f. sp. *vasinfectum* Race 4 in California. J. Cotton Sci. 12:160-164.



Detection of FOV race 4 in soil and seed
Nutrient enrichment in a semi-selective medium

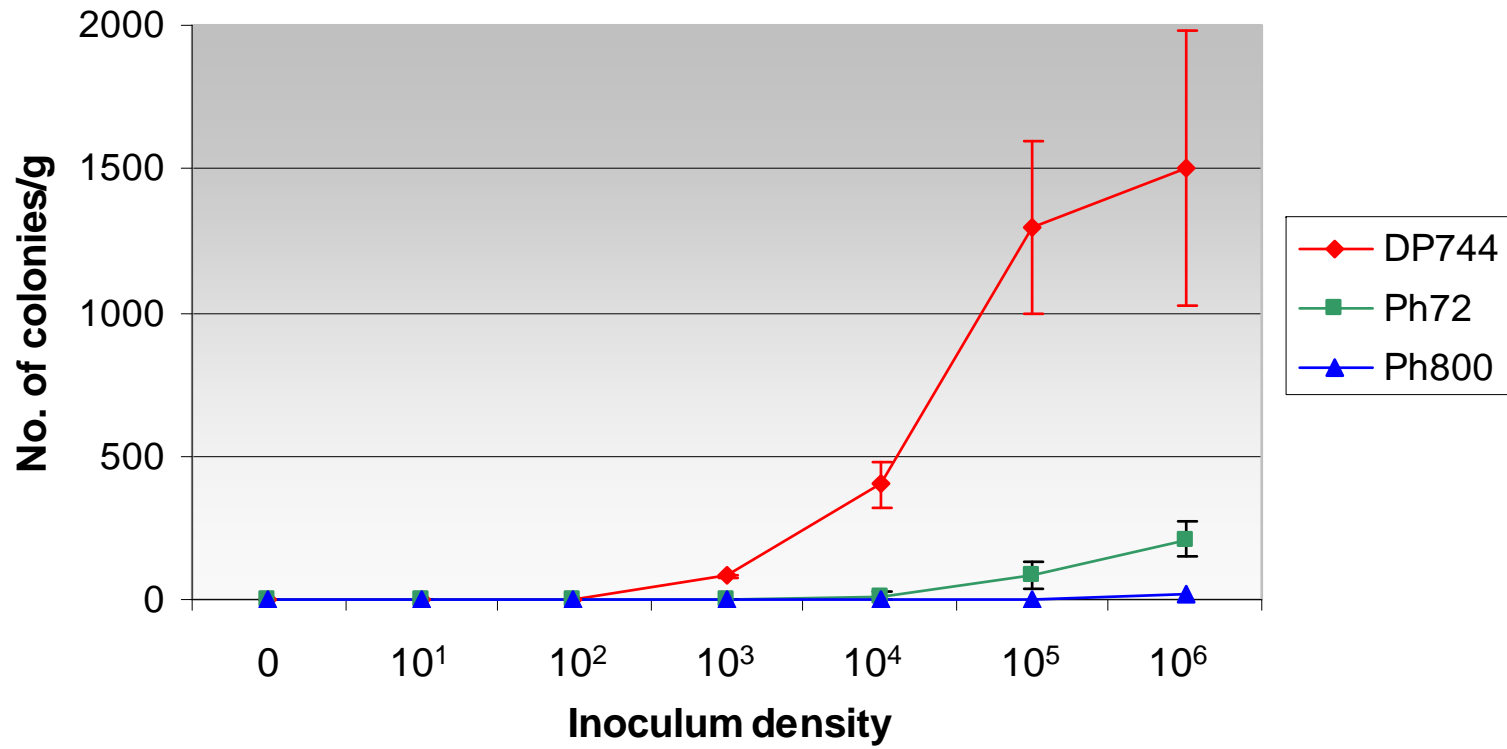






Hao, J. J., Yang, M. E., and Davis, R. M. 2009. Effect of soil inoculum density of *Fusarium oxysporum* f. sp. *vasinfectum* race 4 on disease development in cotton. *Plant Dis.* 93:1324-1328.

Propagules of FOV in Stem Tissue



| Cultivar | Disease index (0-4 where 0 is no disease and 4= plant death) | | | | |
|---------------|--|---------------------|---------------------|---------------------|---------------------|
| | None | 1 X 10 ⁴ | 1 X 10 ⁵ | 1 X 10 ⁶ | 1 X 10 ⁷ |
| Bayer Colbalt | 0 | 1 | 4 | 4 | 4 |
| Acala 725 | 0 | 3 | 3 | 3 | 4 |
| Phy 805 | 0 | 0 | 0 | 0.5 | 4 |
| Phy 800 | 0 | 0 | 0 | 0 | 0.5 |

FOV is an inoculum-dependent disease!

- Determine why cotton hosts many genotypes of *F. o.*
- Develop resistant cotton cultivars
- Help growers reduce soil inoculum density
- Track movement and maintain database of new genotypes