

RESPONSES OF ADDITIONAL GROUND COVER PLANT SPECIES TO MECHANICAL INOCULATION WITH DIVERSE *XYLELLA FASTIDIOSA* ISOLATES

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ABSTRACT

Nine additional plant species and one other cultivar were evaluated in 2009 for reactions to *Xylella fastidiosa* (*Xf*) mechanical inoculations. We investigated relative safety for species use in and near Texas vineyards at risk for Pierce's disease. Seedlings started in the cool season were grown in containers in greenhouse and screenhouse until caulescent and flowering. Mechanical inoculation used Texas *Xf* isolates from grape, weeds, shrub, and tree (*Vitis vinifera*, *Ambrosia trifida* var. *texana*, *Helianthus annuus*, *Nerium oleander*, *Platanus occidentalis*). SCP buffer was the control. Each plant was twice needle-inoculated on different days into xylem of two adjacent lower internodes with two 10- μ m drops of ca. 10^8 cfu/ml SCP-suspended cells. No obvious symptoms developed. Evaluations used ELISA on stem tissue that we recovered after several weeks, from the inoculation site and above the inoculation site. Experiments were repeated but repetitions of yarrow and blanketflower experiments were not yet complete at this writing because late planted seedlings were acaulescent through the summer. Safety as estimated by mechanical inoculation reflected the number of isolates that colonized ($OD \geq 0.300$), mean OD, and whether grape isolates colonized the species. All SCP controls were negative. All species were colonized to some extent by at least one isolate. Tissue location for ELISA (inoculation zone vs. above the inoculation zone) was significant ($P < 0.05$) only for the four species with safer reactions. Those safe species were *Coreopsis tinctoria* (plains coreopsis 'Dwarf red'), *Coriandrum sativum* (cilantro), *Fagopyrum sagittatum* (buckwheat), and *Silene armeria* (catchfly). Species rated as unsafe under conditions of these studies were *Achillea millefolium* (yarrow), *Gaillardia aristata* (blanketflower), *Linum rubrum* (scarlet flax), *Machaeranthera tanacetifolia* (Tahoka daisy), *Oenothera speciosa* (showy primrose), and *Petunia x violaceae* (petunia 'Laura Bush'). *Coreopsis tinctoria* (plains coreopsis), *Verbena rigida* (tuber vervain), and *Lolium multiflorum* (annual ryegrass) met safe plant criteria in previous greenhouse and screenhouse work. Future vineyard evaluations of plant safety may differ from these results due to interactions of plant species and vector species phenologies.

LAYPERSON SUMMARY

An aggressive inoculation technique was used to screen selected groundcover plant species for potential safe use in and near Texas vineyards at risk for Pierce's disease. Relatively safe reactions were detected in 2009 in *Coreopsis tinctoria* (plains coreopsis 'Dwarf Red'), *Coriandrum sativum* (cilantro), *Fagopyrum sagittatum* (buckwheat), and *Silene armeria* (catchfly).

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Section 5:
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