

## Question and Answers for General Session V

**Robert Driver:** Are there mycorrhizae that are detrimental to plant growth? Should we be concerned with which ones are chosen?

**Carolyn Scagel:** It depends on your definition of detrimental. There are cultivar- and isolate-specific effects of using mycorrhizae. Some cultivars responded differently to various isolates of mycorrhizae. The responses are generally determined by trial and error.

**Robert Driver:** Anything that would cause the tree to grow smaller or less efficiently would be considered to be detrimental.

**Carolyn Scagel:** Everything has a cost and a benefit associated with it when you deal with mycorrhizal fungi. Carbon partitioning can be altered in mycorrhizal plants since some of the photosynthate is going to the fungus, but the plant benefits by gaining access to soil nutrients that are freely available due to the activity of the mycorrhizal fungus.

**Melanie Baer-Keeley:** When nursery-grown plants that have been inoculated with vesicular-arbuscular mycorrhizae and then planted in wild situations, does that affect natural soil populations of soil microorganisms?

**Carolyn Scagel:** There is evidence in the literature for the turnover of different mycorrhizal isolates on a root system. In a nursery situation, if a plant is mycorrhizal the isolates on that plant are able to withstand the conditions in that nursery. When you put those plants out in a natural situation there's going to be a turnover of fungi on the roots to fungi that are more capable of actually existing in that natural ecosystem.

**Mary Helen Seeger:** What is the impact of phosphorus in nursery situations on mycorrhizae and can high temperatures in a nursery setting negatively impact the mycorrhizae as well?

**Carolyn Scagel:** I don't know much about temperature effects on mycorrhizal fungi in nursery production. We certainly have seen it if you have an above-ground pot system where you'll find differential death of root tips on the exposed, southern side of a pot that will lead to death of the fungus. Some vesicular-arbuscular plants (e.g., onion) are very sensitive to phosphorus. If you grow an onion plant with a normal amount of phosphorus to achieve the growth you want you will decrease the mycorrhizal colonization. If you decrease the amount of phosphorus you can still get the growth you want since the mycorrhizae will help uptake the phosphorus. It often helps to reduce the fertilization in inoculation trials.

**Ann Chandler:** What is your opinion of the commercial sources of mycorrhizae that are available and how can you guarantee that the plants for sale are mycorrhizal?

**Carolyn Scagel:** I can't say much about the commercial sources. However, with guaranteeing that your plants are infected, it's not technically difficult to show infection with ectomycorrhizae since they are easily seen. It's more difficult to show infection with endomycorrhizae, but there are reputable labs that have the necessary equipment for testing if you don't have microscopes of your own.

**Robb Sloan:** How were the cuttings treated with the fungi?

**Carolyn Scagel:** It depends on the inoculum type. For some we mix the soil inoculum containing spores and root fragments with the rooting medium or I prefer to cut into the rooting medium, insert the inoculum medium and then insert the cutting.

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## Discovering and Patenting a Chinese Pistache Tree: *Pistacia chinensis* 'Pearl Street'<sup>®</sup>

**Allen Lagarbo**

City of Modesto - Forestry Division, P.O. Box 642, Modesto, California 95353

### INTRODUCTION

The Chinese pistache tree has long been a popular tree in temperate areas of the United States. This species originates in areas of China, Taiwan, and the Philippines, and is suitable for many areas of the world. Known for the brilliant fall colors of red, orange, and yellows in early fall, it is a medium grower to 40 ft in height with a spread of equal dimensions. Chinese pistache is an excellent street, lawn, yard, parking lot, and park tree.

**About Modesto.** *Pistacia chinensis* is one of the most popular trees grown in the greater Central Valley of California. A deep-rooted tree, it has little or no surface rooting or root conflicts near pavement. A species requiring less moisture than most trees and having very few disease or insect problems in healthy trees in the proper growing environment.

*Pistacia chinensis* and a popular cultivation 'Keith Davey' grow more open and spreading, which can conflict with traffic or buildings nearby. The industry needed a seedless, male, upright *P. chinensis* that would grow alongside buildings and streets with no conflicts.

Modesto's Urban Forest consists of over 100,000 public trees along streets, parks, and golf courses. Modesto is historically known for its forests diversity, unique management techniques, and as a testing ground for species and IPM research. With national awards and titles, Modesto is truly a "Tree City, USA".

As one of the first ever trees patented by a municipality, Modesto was visited by the plant patent examiners themselves to see the *P. chinensis* 'Pearl Street' (Plant Patent #9,242) in 1996. The patent, on first application was described as "perfect".

### THE PLANT PATENT APPLICATION

An application for a plant patent is made to the Commissioner of Patent and Trademarks.

A plant patent is a grant by the Government to an inventor (or his heirs or assigns) who has invented or discovered and asexually reproduced a distinct and new cultivar of plant, other than a tuber propagated plant or a plant in an uncultivated state, the grant being the right to exclude others from asexually reproducing the plant or selling or using the plant so reproduced for 20 years.