

NEW TREES FOR METROPOLITAN LANDSCAPES - CHINESE PISTACHIO

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ABSTRACT. The Chinese pistachio is being recognized as a medium sized shade tree of good form which is drought tolerant and resistant to insects and disease. It is cold hardy in hardiness Zone 6. The dioecious species develop attractive dark red compound leaves in the fall. It is easily propagated from seed and vegetative propagation by budding has been successfully demonstrated. Most research in the genus has been with the edible nut species. Field plantings for adaptability studies and superior clone selection appear appropriate.

Pistacia chinensis Bunge is a deciduous dioecious exotic tree, a native of China (Bailey 1949). It is described as a tree to 60 feet in height, leaves even pinnate, 10-12 leaflets, turning crimson in autumn, leaflets lanceolate, 2-4" long, acuminate, oblique; drupe ovoid, red, turning purple, about 1/5" across, in large panicles 6-10" long. In shade tree circles it is often mentioned as a worthy shade tree, adaptable to urban conditions and resistant to insects and diseases.

There are numerous California publications on the genus Pistacia. They are confined primarily to P. vera, the commercial nut species and to P. atlantica and P. integerrima, two species used as root stock for P. vera. (Takeda and Crane 1980; Crane and Iwakiri 1981). Maranto (undated) reported that P. chinensis was found to provide poor rootstock for P. vera because of slow initial growth and scion overgrowth at the bud union. Perhaps because of the economic interest in nut bearing pistachios, there has been less formal research with Pistacia chinensis in California than one might expect. However, the Saratoga Horticultural Foundation has compiled observations from numerous sources (Coate 1983, personal communication). Coate reported that the city of Fresno has contributed its experience in propagation by Robert Belcher. Roger Hallin commented on the "Keith Davey" Chinese pistachio, a male cultivar, in correspondence with Saratoga. It was planted on parking lots at Stanford University in 1964.

There is reference to the effects of different planting media on the establishment and growth of Pistacia chinensis seedlings at Oklahoma State University (Roggow and Whitcomb 1973). However, the most in-depth study of P. chinensis was made by Pair and Khatamian (1982) at Kansas State University. In Texas, about thirty trees were planted on the main campus of Texas A&M University in 1964. As far as

can be determined, all these trees remain today. In San Antonio, plantings date back to the late 1930's and frequent plantings have been made of seedlings from the original trees. The largest tree still growing, from my observations on South Flores Street, had a dbh of 35 inches in the Spring of 1983.

It has long been recommended that Chinese pistachio be planted in a hardiness zone no colder than Zone 7. However, perhaps in part to the report of Pair and Khatamian (1982) who have been growing the tree in hardiness Zone 5, Mbrovia Nurseries of Azusa, California, rate it satisfactory for Zone 6 in their 1983 catalog.

Seed propagation

The following propagation methods have come from the work of Pair and Khatamian (1982), Aldridge Nurseries, Von Ormy, Texas, personal communication (1983), and the Saratoga Horticultural Foundation (personal communication, 1983).

Seed collections are made after the fruit turns from green to red, then purplish in early fall. This period may extend over a period of several weeks, according to my observations on the Texas A&M University campus. Joley (1960) reported however that red fruit was immature and that only seed from purplish or bluish-green fruit will germinate.

Aldridge reported up to 90% germination from seed with red fruit after 45 days of stratification at 40°F. No attempt was made to remove the pulp surrounding the seed. Aldridge's seed source was from a tree in Tyler, Texas.

Pair and Khatamian collected the seed in October from Lubbock, Texas to areas in Kansas. The seed was separated from the pulp by soaking for two or three days to allow the pulp to ferment and slip from the seed. A blender was used to separate the pulp. Heavier seed settled to the bottom while the light seed and pulp were strained off. Seed were sown in a peat and vermiculite mix in November and January and stored at 4°C until spring when seed flats were placed over bottom heat at 27°C. Stratified plantings were compared with unstratified plantings. Germination ranged from 63-92 percent for stratified seed, compared with 0-24 percent for untreated seed.

The city of Fresno transplanted the seedlings, into 2-inch liners after the second set of leaves had developed. After root development in liners, the seedlings were transplanted into 1-gallon containers and kept under lath for one year.

Vegetative propagation

Rooted cutting work was reported by Joly (1960) and Lee et al., (1976). They increased rooting of semi-hardwood cuttings from 28 to

70% using a pretreatment of 2N H₂SO₄ for 15 seconds followed by a 20 second dip in 3000ppm IBA.

Joley reported that August budding was most successful. Some California growers reported better budding success when wood was removed from the bud. Pair and Khatamian used hardwood cuttings from the previous seasons growth in January and treated with 0, 5000, 10,000 and 20,000 ppm indolebutric acid (IBA) and rooted in a peat:perlite (30:70 v/v) medium with bottom heat. Softwood cuttings, collected in June and treated with 10,000 ppm IBA proved the most promising, however, with up to 92% rooting.

It has been generally observed that P. chinensis does not handle as well as bareroot trees. However, Pair and Khatamian reported that no difficulty had been encountered with one- or two-year old seedlings if roots are kept moist in storage or if transplanted immediately.

The city of Modesto, California has reportedly been using Pistacia atlantica in street tree planting trials because less pruning of lower branches is needed. However, P. atlantica does not have the desirable fall leaf color of P. chinensis.

My personal experience with Pistacia chinensis has been limited. A drought study of exotic and native species on the University of Texas - San Antonio campus (Dewers 1981) indicated that the species was more drought tolerant than 70 of 95 native and exotic species. During my eight years of observing shade tree species in San Antonio, I did not observe insect or disease problems associated with P. chinensis. The attributes shown qualified the species as a desirable street tree. I have also observed the low branching habit of seedling stock. I regard this trait as an advantage because the low lateral growth promotes a stronger main stem that resists wind damage, common to individuals grown in nurseries and regularly pruned to gain a "respectable" height for retail sales. These low laterals can be conveniently pruned after a tapered trunk is formed. The result is a strong well proportioned shade tree for street or yard.

It is obvious from this report that little structured research has been conducted with P. chinensis. Except for propagation techniques, most data must be interpolated from work with P. vera. Field trials in areas of diverse soil and climatic conditions appear warranted if we are to have adequate knowledge of this species for use recommendations.

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