



United States Department of Agriculture  
Natural Resources Conservation Service  
Plant Materials Program

# 'Marana'

## fourwing saltbush

*Atriplex canescens* (Pursh) Nutt.

A Conservation Plant Release by USDA NRCS California Plant Materials Center, Lockeford, CA



'Marana' fourwing saltbush (*Atriplex canescens*) is a cultivar released in 1979 in cooperation with the California Agricultural Experiment Station.

### Description

'Marana' fourwing saltbush is a native, long-lived, evergreen shrub with grey foliage and inconspicuous flowers. It derives its name from the four membranous "winged" utricles which encompass the seed. Plants average 8 feet in height by 12 feet in diameter. Bloom period ranges from May to September, with seed maturing October through December. Fourwing saltbush has a root system with a taproot and lateral feeder roots. Where soils allow, taproots often extend more than 20 feet and in southern California deserts, fourwing saltbush taproots have been found as far as 40 feet below the soil surface

### Source

'Marana' fourwing saltbush seed was originally collected in 1961 from a population in El Cajon, San Diego County, California. The collection site is at approximately 400 feet elevation, and receives an average of 12 inches annual precipitation, with an average maximum temperature in August of 88F and an average minimum temperature in December of 40F. Performance of 'Marana' fourwing saltbush was compared to other accessions tested at thirty field sites across California. 'Marana' was selected for ease of establishment and drought resistance. It showed superior performance to all other accessions of this species tested in the Mediterranean climate of California.

### Conservation Uses

Fourwing saltbush is an important species throughout the southwest as wildlife habitat and forage, and is

recognized for its soil stabilizing contributions, especially in relation to sand dune ecosystems. 'Marana' has shown excellent performance for use as a conservation plant for critical area plantings, erosion control, and upland game habitat, both as a food source and woody cover. Fourwing saltbush, as a long-lived shrub, can become straggly with age if not grazed or otherwise managed.

In the coastal and interior sage scrub communities of California, this species may be found interspersed with chamise (*Adenostoma fasciculatum*), California sagebrush (*Artemisia californica*), and California brittlebush (*Encelia californica*).

### Area of Adaptation and Use

'Marana' fourwing saltbush performs well in the Mediterranean climate of California at elevations up to 4,000 feet and at annual precipitation ranges from 8 to 40 inches; it has a moderate tolerance to cold. This cultivar survives on sandy to clay loam, well-drained soils, but is best suited to deep, well-drained soils which range from loamy to sandy to gravelly in texture.

Fourwing saltbush is one of the most widely-distributed native woody species in North America, ranging from southern Alberta to central Mexico and east-west from the Missouri River to the Pacific Coast. As a species, fourwing saltbush has some unique characteristics: it has a high tolerance to boron; is very tolerant of saline and somewhat tolerant of sodic conditions; does not tolerate a high water table or late winter inundation; is extremely drought tolerant with fair shade tolerance; and is not very fire tolerant, but may re-sprout after low intensity fire events.

### Establishment and Management for Conservation Plantings

'Marana' fourwing saltbush can be established from transplanted container stock or directly seeded into the field, but young plants grow slowly and can require up to four years for establishment. Prior to planting, the site should be free of weed competition and have accumulated soil moisture or supplemental irrigation available, if necessary. Planting should be scheduled according to local conditions for soil temperature, soil moisture, and weather in relation to the type of material being planting, seeds or transplants. The establishment of transplants is generally more successful with early spring planting.

Seedbed preparation should begin well in advance of planting in order to eliminate weed competition at the site and create a firm seedbed. In arid environments, soil pre-conditioning which provides partial shade, such as pits

and furrows, may be crucial for establishment. Long seed viability enables direct seeding to occur during most times of the year, with plant emergence occurring when conditions are favorable (some allowance should be made for seed predation). Recommended direct seeding rates are 2 pounds pure live seed (PLS) per acre drilled or 4 pounds PLS per acre broadcast, with a minimum of 6 inches between seeds. When planting a mixture, the rate of 'Marana' seed should be reduced according to the total percentage desired in the mixture. Planting depth should be between ¼ and ½ inch. Broadcast seeding may be used in areas not easily planted with a drill, but additional practices, such as cultipacking and harrowing, may be necessary after planting to encourage good seed to soil contact.



'Marana' fourwing saltbush plant at the Lockeford Plant Materials Center.

### Ecological Considerations

There are no known insect or disease problems and the species is not considered weedy.

### Seed and Plant Production

'Marana' fourwing saltbush is an excellent seed producer. Seed dries on the plant which allows for some flexibility in harvesting, but browsing animals, insects, wind and heavy rains can significantly decrease seed retention on the plant. There are approximately 132,000 de-winged seeds per kilogram (60,000 seeds per pound).

Germination success of viable seed is not fully understood; there appears to be a relationship between the removal or retention of the utricles ("wings") of the seed and the type of soil or media used as substrate. To

increase germination success, it is recommended that seeds with and without utricles be sown into soil with temperatures between 60-75°F. 'Marana' seed has germination success rates ranging from 55 to 85 percent.

For production of containerized plants, seed should be sown in deep containers (such as Ray Leach supercells) using a relatively quick draining media with a moderate organic component to allow for nutrient and water retention (e.g., Sunshine #4 mix). Seedlings should be transplanted to the field when roots are well established, or they can be maintained for a longer duration if they are potted up into larger containers (such as D40 or TPOT1) to allow for adequate root development.

### Availability

*For conservation use:* 'Marana' fourwing saltbush has limited availability of seeds and plants from commercial growers.

*For seed or plant increase:* Seed is maintained and available through the USDA-NRCS Lockeford Plant Materials Center for seed increase.

*For more information, contact:*

USDA-NRCS

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