THE USE OF CALIFORNIA NATIVE PLANT MATERIAL AS A MEANS OF CONSERVING WATER IN THE LANDSCAPE

California native plants can be successfully used to create attractive landscapes with little or no irrigation. Although not all native plants are tolerant of drought, many are well adapted to arid climatic conditions.

Some of the characteristics which help these plants perform well under low moisture conditions are:

- California native plants are often very deep rooted and capable of obtaining water from a large volume of soil.
- Many California native plants have leaves adapted to use less water in summer. Some of these adaptations to reduce the transpiration rate are fewer stomata, thick cuticle, curled leaves, many plant hairs, reflective color, and leaves turned to face the leaf edge to the sun.
- Some native plants become dormant in summer, and are deciduous or semi-deciduous during periods of low rainfall.

Most successful unirrigated landscapes which utilize California plants are in coastal or foothill and mountain areas where moister climates prevail, or in habitats with a high water table. This success reflects the fact that most of our native plants which we use in landscaping come from these areas.

Difficulties often result when native plant materials are used in interior valley or in desert areas. The major reason for this is that the quantity of really useful plant species adaptable to no irrigation in these areas is quite limited. These drier regions tend to have very hot summers and cold winters, short spring seasons, and hot, dry air and wind. Soils vary tremendously from coarse sands to heavy clays, and alkaline and saline conditions are common.

At Davis, California, where the climate is representative of the California interior valleys, we have had good success growing some native plant material. By success, for the purposes of this report, we mean the use of plant material that needs no supplemental irrigation and yet remains attractive and vigorous all year with no maintenance. A list of this plant material follows.

FULL SUN (low water table, no irrigation after first year)

Trees: California buckeye, *Aesculus californica*
Big cone Douglas fir, *Pseudotsuga macrocarpa*
Foot-hill pine or gray pine, *Pinus sabiniana*
Torrey pine, *Pinus torreyana*
California fan palm, *Washingtonia filifera*
Blue oak, *Quercus douglasii*
Palo verde, *Cercidium floridum*
Shrubs:  Foot-hill tasselbush, *Garrya congdonii*
Desert Olive, *Forestiera neo-mexicana*
Chaparral pea, *Pickeringia montana*
Island bush poppy, *Dendromecon rigida* subsp. harfordii
Buckbrush, *Ceanothus cuneatus*
Greenback ceanothus, *Ceanothus spinosus*
Bigpod buckbrush, *Ceanothus megocarpus*
Manzanita, *Arcotostaphylos manzanita*
Creosote bush, *Larrea divaricata*
Jojoba, *Simmondsia chinensis*
Nolina, *Nolina species*
Sugarbush, *Rhus ovata*
Yucca, *Yucca whipplei*
Maguey, *Agave deserti*
San Fernandeo barberry, *Mahonia nevinii*
Leather oak, *Quercus durata*
Bladder pod, *Isomeris arborea*
Rabbit bush, *Chrysathamnus nauseosus*
Encelia, *Encelia californica*
Chamise, *Adenostoma* species
Mormon tea, *Ephedra* species
Chuparrosa, *Beloperone californica*

**PROTECT FROM AFTERNOON SUN** (low water table, no irrigation after first year)

Trees:  Coast live oak, *Quercus agrifolia*
Mesa oak, *Quercus engelmanii*
Santa Catalina cherry, *Prunus lyonii*
Hybrid holly-leaf cherry, *Prunus lyonii X P. ilicifolia*
Santa Cruz Island ironwood, *Lyonothamnus floribundus* var. *asplenifolius*
Coulter pine, *Pinus coulteri*
Jeffrey pine, *Pinus jeffreyi*
Yellow pine, *Pinus ponderosa*
Pinyon pine, *Pinus species*
Sargent cypress, *Cupressus sargentii*

Shrubs:  Manzanita, *Arcotostaphylos rudis, A. pajaroensis*
Redberry, *Rhamnus crocea*
Coffeeberry, *Rhamnus californica*
Fremont barberry, *Mahonia fremontii*
Tassel bush, *Garrya fremontii, G. elliptica*
Toyon, *Heteromeles arbutifolia*
Redbud, *Cercis occidentalis*
Holly-leaf cherry, *Prunus ilicifolia*
Fuschia gooseberry, *Ribes speciosum*
Chaparral current, *Ribes malvaceum*
Apache plume, *Fallugia paradoxa*
Summer-holly, *Comarostaphylis diversifolia*
Palo blanco, *Ornithostaphylis oppositifolia*
Island mountain mahogany, *Cercocarpus betuloides* subsp. *blancheae*
Fremontia, *Fremontodendron species*
Wild rose, *Rosa californica*
Wild buckwheat, *Eriogonum species*
Ground Covers:
- California fuchsia, *Zauschneria* species (mow down each winter)
- Catalina currant, *Ribes viburnifolium*
- Maritime ceanothus, *Ceanothus maritimus*
- Dwarf coyote bush, *Baccharis pilularis* subsp. *pilularis*

To help guarantee the success of California native plants used on very dry sites the following should be done.

- **Keep the soil free of other competing plants.** This includes weeds and the exclusion of other ornamentals within an area equal to twice the drip line area of the native plant.

- **Mulch.** This practice buffers the soil from temperature extremes, traps moisture, and discourages weeds. Mulching materials include wood chips, fir bark, pine needles, fine gravel or coarse sand, or even dust mulch, which should be renewed yearly. Asphalt, sometimes known as "Detroit Mulch", has also been used successfully.

- **Improve soil conditions.** This may include lowering the pH, improving physical properties through the use of organic materials and gypsum, leaching of salts, and breaking of hardpan (if present).

- **Make provisions for shade.** Many natives succeed on dry sites if they are protected from full sun, especially in the afternoon, or if the plant's active root zone is shaded, especially important for shallow-rooted plants.

- **Planting.** This is best performed just before or during the rainy season. This reduces transplant shock and allows the plant's roots to establish at greater depths so that summer drought is not as damaging. When planting, soil should be prepared so that water penetrates and is retained at greater depths. Irrigation basins and mulching will help in establishment of the plant, and care should be taken so that soil will never accumulate above the root crown.

California native plants, although relatively pest free, are not without problems. Since some plant material is quite inflammable it is best to use low growing plants or to avoid planting near buildings in high fire danger areas. The reduction of irrigation on these flammable plants will also result in reduced growth and less accumulation of potential fire fuel.

Diseases such as root and crown rots are often aggravated by summer irrigation or poor planting practices. Pruning can increase the danger of cankers on some natives such as ceanothus, manzanita, or fremontia and should be avoided as much as possible. Tip prune only, and perform pruning just after the rainy season.

The general aesthetic appearance of natives should be considered. Many plants become rather unattractive towards the end of summer unless they are watered occasionally during the dry season. Generally, one to five deep waterings during this period will improve the plant's appearance considerably. The public acceptance of the appearance of drought tolerant plantings is of concern and is presently being studied at U.C. Davis.

Before choosing drought tolerant California native plants it is quite important to question the plant list being used. Often plants which are listed as performing well in dry situations for one area will be unacceptable in other locations. The use of California natives in the landscape for drought conditions is increasing, but more observations and more controlled research are definitely needed to produce dependable information on their landscape use in our water-scarce environment.