Special attention should be given to Eucalyptus, one of the most versatile plants to use for preservation. First, treat the branch in the usual manner, crushing stem, etc. Then extend the absorption time until you see the solution bubbling out of the stem. This is an indication that the branch has absorbed all it can, and is now beginning to transpire the excess solution. Now expose the branch to full, hot sun for two or three days. You will observe that the sun will bake a very beautiful reddish brown color into the leaves of the branch. The main stems of the branch will be almost ebony-black. Wiping the leaves with a soft, dry cloth will give them a very high luster.

One point should be considered in treating slow growing plant materials. Their treatment time may be quite lengthy. An example of this kind of material is *Magnolia grandiflora,* which may take as much as six weeks to obtain the desired results. In order to obtain a very dark brown, or almost black leaf it is often necessary to make a fresh cut and a fresh crush at the base of the stem after a week of treatment. Often, when using Magnolia the absorption rate will seem to slow down. This results in dry edges on the leaves. The leaves can be dabbed with the glycerine solution to prevent such drying. The solution is absorbed through the leaves.

Foliage such as peach, apricot, pear and other soft leaves will hang limp after absorbing too much glycerine solution. There is a lot of experimenting still to be done in processing these types of leaves. Most leathery type leaves absorb the solution well. Fleshy or succulent leaves do not hold up.

Some of the trees and plants that will treat well are: *Magonlia grandiflora,* most eucalyptus, oaks (evergreen and deciduous), native and European sycamores, bays, loquat, acacias (both in and out of bloom), the *Prunus* family which includes the peach and apricot; oleander, camellias, Australian tea in bloom, heather in bloom, guava and pittosporum. Some weeds are treated to advantage, such as dock.

Materials preserved by the described process will last from six months to two years depending upon the type of leaf and the glycerine saturation of the foliage.

Information Aid
Descanso Gardens

Salt Affected Soils

DONALD EBERHARD

Many soils in the Western United States contain sufficient salts to restrict or prevent plant growth. This problem is common in areas of low rainfall and, unless it is understood and prevented, extensive damage may occur.

TYPE OF SALTS

Salts most commonly found in soils consist primarily of sodium, chloride, nitrate and sulfate; secondarily of potassium, bicarbonate, carbonate, nitrate and boron, which may take the form of sodium chloride (table salt), magnesium sulfate (Epson salts), calcium sulfate (gypsum) and other combinations.

SOURCE OF SALTS

The primary source of all salts is the earth's crust. Decomposition of rocks by weathering processes releases salts in a soluable form. In high rainfall areas, the salts are normally leached through the soil into the ground water and eventually to the ocean. In arid regions, where rainfall is not sufficient to leach all of the salt out of the soil, salts collect in low areas or are washed into streams or rivers. This water, with its load of salts, may be used again and again downstream for irrigation, such as with the Colorado River. The accumulation of salts to a harmful degree may be caused by certain irrigation practices.

The water table may rise to a point where water is evaporating from the surface. As the water evaporates, salts are deposited on the surface or left as a residue in the soil. The other and more common source of salts is due to surface application of water which is high in soluble salts. All irrigation waters contain varying amounts of salts of various types. It is very important to know the amount and kind of salts in your irrigation waters, because waters of different quality are handled differently.

When the water enters the soil several things may happen. If enough is applied it may percolate through the soil and take the salts with it. More often, the water is used by plants or evaporates from the surface and many of the salts are left as residue. As this keeps occurring, the salt content builds up and may reach a level where the plants will be damaged. Certain fertilizing practices may build up the salt content in the soil. Continued use of steer manure with insufficient leaching will cause a salt build-up in the soil. Restricted drainage may cause a build-up of salts by preventing the salts from being leached out of the soil.

EFFECTS ON PLANTS

Salt affects plants in two ways. The accumulation of salts in the root zone results in an increase in the osmotic pressure in the soil solution and, in consequence, the rate of entry of water into the plant roots is decreased. (This happens even though the soil has plenty of water in it, but the salts make it unavailable to the plants.) The second effect on plants is a specific toxicity effect. The chemicals which are most frequently toxic when accumulated in excess amounts in the plants are: chloride, sulfate, bicarbonate, sodium, calcium, magnesium and boron. A characteristic leaf burn develops (such as marginal necrosis) and the leaves drop off when salt toxicity is the problem.

EFFECTS ON SOILS

Saline soils contain an excess amount of salt with a relatively low sodium content. Normally, saline soils have a good physical structure and the main effect is the reduced water uptake by the plants. This type of salt is sometimes detected by a white crust on the soil surface.

Alkali, or sodic, soils contain an excess of sodium salts which give rise to poor physical conditions in the soil. Poor water permeability, decreased aeration and difficult tillage are characteristics of a sodic soil. These soils often exhibit black surface deposits which led to the term "black alkali."

Soils that contain both too much salt and too much sodium are called saline-sodic soils and have the worst features of both types.

IMPROVING SALT AFFECTED SOILS

Leaching of water through the soil is the only method of solving the salt problem. There are no chemicals that will neutralize salts.

Saline soils are relatively easy to leach if there is good drainage. Often poor drainage has caused the saline condition and in this case, drainage must be provided before leaching can be accomplished. If poor quality water is all that is available for leaching, it is important that the salt level in the soil be brought down to the lowest possible level. Also, that frequent leachings be applied at regular intervals following reclamation.

Sodic and saline-sodic soils need a soil amendment to successfully accomplish reclamation. Before leaching it is necessary to add gypsum, sulfur or some other amendment that will cause displacement of the sodium. The amount of amendment necessary can best be determined by a soil analysis. The amount of water needed depends on the amount of salt present and the quality of the water. Six inches of water moving through the soil leaches about fifty percent of the salt out of the top foot. To get a complete reclamation it normally takes at least two feet of water passing through the soil.

SALT TOLERANT PLANTS

Plants vary in their tolerance to salts. When a condition exists that prevents complete leaching of the salts or a poor quality of water is the only choice, salt tolerant plants must be used, if the salt level is within their range of tolerance. Lists of salt tolerant plants are available. Included are: palms, eucalyptus, olives, many shrubs and several ground covers including bermuda grass.

PREVENTING SALT BUILD-UP

Prevention of salt accumulation is much simpler than trying to correct it. Proper watering procedures are the best insurance against salt build-up. Good drainage is also important and should be checked first and developed if necessary. Proper watering includes enough water at regular intervals so that part of the irrigation water goes through the soil and carries away any excess salt. Light, frequent irrigations increase the danger of salt accumulation, while infrequent, heavy watering prevents salt build-up.

SUMMARY

Salts are found everywhere but they are normally only a problem in the arid West. The main source of salts coming into a soil is through the water. The only way to get rid of salts is to leach with water. An excess of sodium salts in the soil deteriorates the physical condition of the soil; amendments are needed in conjunction with leaching to complete reclamation. The best way to find the amount and types of salt in the soil is by having the soil analysed by a laboratory experienced in salted soils.

Paulownia Tomentosa

ROSS GOODRICH

Almost any list of interesting deciduous trees would include the Empress tree of China, *Paulownia tomentosa.* A good specimen of this tree can be seen on a tram ride through the Los Angeles State and County Arboretum. Along the middle of the Asian Section, where the curve of the road seems to take you right into the plantings, this tree stands just a short way up the bank.

P. tomentosa, tall and pyramidal shaped, is noticeable at any time of year in each of its three annual phases: winter bareness, spring bloom, summer leaves. In winter, the leafless branches hold on to the empty seed pods from last year's bloom and display the velvety, brown buds for the next. An unspeakable combination to the tidy minded, this winter beauty was one of the reasons for its cultivation in China from an early date. At the Arboretum, the blossoms have usually opened during the gloomy early spring. Lavender and foxglove-like, they are hard to see against the grey sky, but show up brightly, like a jacaranda, in front of other trees. Their fallen blossoms are attractive on the lawn and their gentle lemon scent doesn't drive one from the area. The blooming period has been short. The leaves come on fast to make the tree look like a catalpa. Its summer shade is dense and cooling and the leaves hang on until October.

Beautiful? Yes.