

nurseries (Farnham et al., 1985). Use of water with an SAR value greater than 9 can lead to severe nutritional problems and, in field soils, degradation of soil structure and reduced water permeability. Problems with permeability do not usually occur with highly organic container media until SAR values exceed 35 (Farnham et al., 1985); at these values, most plants would not survive anyway.

Sources of Soluble Salts

High soluble salts result when insufficient leaching allows accumulation of salts in the medium. The salts may be naturally present in medium components, or may be introduced by fertilizers or by irrigation water that contains salt. Salts include fertilizer components and decay products of organic matter as well as compounds derived from breakdown of the potting medium. Wellwater may contain high concentrations of dissolved calcium, magnesium, carbonates, and bicarbonates. With saline or brackish water, the salts involved are sodium and chloride.

Measuring Soluble Salts

A part of every nursery's program should be regular monitoring of soluble salts and pH, in addition to having thorough water, container media, and leaf analysis tests run by a professional testing lab. During the growing season, irrigation water and container media should be tested for soluble salts at least monthly, and twice each week if fertilizer is injected through the irrigation system. A solubridge or conductivity meter may be used to measure soluble salts. These instruments operate on the principle that water with salts dissolved in it will conduct electricity, whereas pure water is a poor conductor of electricity. The electrical conductivity of a solution is proportional to the concentration of dissolved salts. A solubridge or conductivity meter is a wise investment for any nursery.

To measure soluble salts with one of these instruments, cores of container medium should be collected from 8 to 10 containers and then blended together. The saturated paste method is the preferred technique for measuring soluble salts. This method involves saturating a small volume of medium (about a half pint) with distilled water. Water is added to the medium slowly while stirring until the medium surface is shiny but no water moves across the surface when it is tilted. The sample should sit for at least two hours to allow the salts to equilibrate. The soil solution is extracted from the sample by vacuum-filtering the saturated medium. The extract is poured into a suitable container, and the electrode is immersed in it. The meter is read in deciSiemens/m, millimhos/cm, or micromhos/cm, depending on the instrument and its scale. Soluble salts