CALCULATION OF LEACHING REQUIREMENT

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For a more exact recommendation of the leaching requirement, we statistically determined an equation which related replacement efficiency to a physical property of the mix. The physical property which was best for predicting replacement efficiency was the water porosity.

In order to determine how much leachate is required to bring the soil solution to the desired level, calculate % Removable Salt (i.e. % of the original soil solution which must be replaced) from:

$$\% \text{ Removable Salt} = \frac{SS^0 - SS^1}{SS^0 - LS} \times 100$$

Where: SS^0 is the soil solution concentration before leaching (in meq/l), SS^1 is the desired soil solution concentration

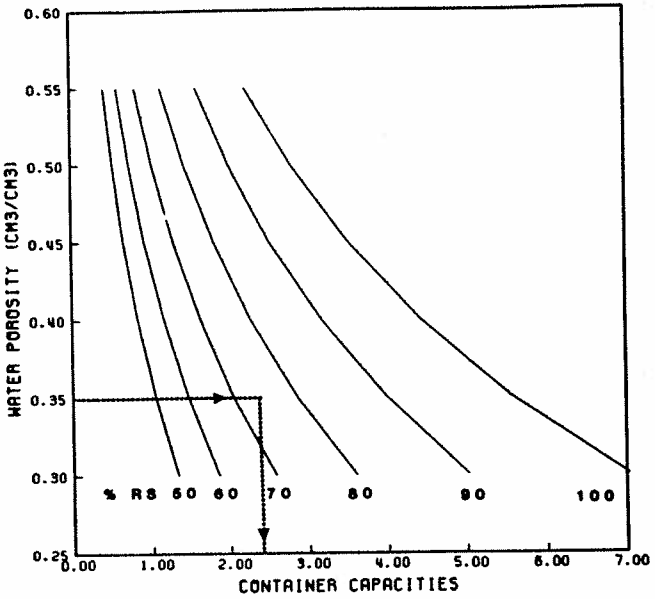

Fig. 1: Plot of the equation relating leaching efficiency (% Removable Salt) to volume of leachate and a physical property of the mix (water porosity). After calculating:

$$\% RS = \frac{SS^0 - SS^1}{SS^0 - LS} \times 100$$

one could determine the volume of leachate required by following horizontally from the water porosity of the given mix to the appropriate % RS, then reading volume. For the example given in the text (water porosity = .35 and % RS = 75), the volume of leachate required is 2.44 container capacities (follow dashed line).

(in meq/l), and LS is the leaching solution concentration (in meq/l). A grower can find the volume of leachage required from Fig. 1. Note that conversion between electrical conductivity (EC) in micromhos/cm and milliequivalents/l (meq/l) concentration is to multiply EC by 0.1.

For example, if the initial soil solution concentration was 30 meq/l, but a grower wanted it to be 15 meq/l, and the leaching solution concentration was 10 meq/l, then:

$$\% RS = \frac{35 - 15}{30 - 10} \times 100 = 75$$

For a mix with a water porosity = .35, move horizontally from this water porosity on the vertical axis of Fig. 1 to the desired % RS line. Then drop vertically from this point to read the volume of leachate required on the horizontal axis. In this example, 2.4 container capacities of leachate would be required.

It was intended that this plot be used as a first step toward developing recommendations for leaching of salt from potting media. It should be kept in mind that these recommendations were developed for leaching chloride salts by continuous flooding when the mixes were initially at container capacity. Further investigations are required to determine the changes in leaching caused by different initial soil moisture levels, different application rates, limited distribution of the leaching water (as with drip irrigation), distribution of salts in the soil profile, and different salt types.

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