# The Story Behind Leaching

Harry C. Kohl, Jr.
Dept. of Floriculture,
Cornell University

What is leaching?

Leaching soil in the greenhouse is the process of removing salts from the soil by the application of very large amounts of water.

How do we leach?

We leach by applying a great quantity of water to the soil allowing it to percolate through and drain. The amount of water which need be applied varies with the soil, but is more than one might think. A good leaching results when four applications of water are made at the rate of one gallon per square foot for each application. The applications should be made immediately following one another -- all in the same day. It is advisable to use warm water (65-75°F) because the salts are more soluble in warm water and the plants will not be harmed as they might if cold water were used.

This water may be applied from the surface or it may be injected to flood the soil from below. Flooding and draining should be practiced in water-tight benches rather than the surface application of water.

Why do we leach?

We leach to remove some of the soluble salts from the soil. These soluble salts are chemicals which are dissolved in the soil water. Some chemicals are necessary nutrients in the soil water but an excessive amount of necessary salts combined with other unnecessary salts makes water uptake difficult for the plant and causes the same symptoms as lack of water caused by root injury.

When do we leach?

Research and observation have shown that any soluble salts reading of 200 or more* is in the danger zone and the soil should be leached. There is some indication that a lower figure is in the danger zone for some cool house crops such as stocks and snaps and for young plants but there is insufficient data at this time to make a definite statement. In general, it is a good practice to leach a soil, which is to be reused, a week or two before the old crop comes off. Following this leaching the new crop can be started at a low level of nutrients and a low level of soluble salts. This procedure is especially important with young mums and snaps following mums. High soluble salts is one of the most frequent reasons why young plants stand still for a long time after being benched.

* In our test for soluble salts, two parts of water are used to one part of soil.

What other points are important?

Leaching is non-selective salt removal and therefore takes out the useful nutrients as well as the harmful and useless ones. After leaching the soil should be tested and the necessary fertilizer applied to bring the needed nutrients to their proper level.

Can we remove soluble salts in any other way?

Soluble salts -- especially the nitrates -- can be removed from the soil water by the application of high carbohydrate organic material such as straw, sugar cane, pulp, sugar, corn cobs, and others. The removal of the mineral nutrients is mainly due to the action of the soil micro-organisms and is very slow at low temperatures. After the carbohydrates are decayed, some of these nutrients are released again to the soil solution.

Of great importance when using this method for removal of nitrates is frequent testing of the soil nutrients. This is important because very frequently too much of the nitrate is used up, leaving the soil deficient.

* * * *