EDITORIAL

Salinity in the production of flowers and ornamental plants

LEANDRO FLÁVIO CARNEIRO[1]

One of the main factors that affects the production of ornamental plants is the proper irrigation management, as it meets the water needs of the plant and also ensures good availability of oxygen to the roots. One factor to be considered in this management is the quality of water, since a low quality may favor toxicity of some elements, the formation of chemical precipitates and high salt concentrations in the soil/substrate solution, defined as salinity. The most common salts are chlorides, sulfates, bicarbonates and nitrates.

The increased concentration of salts hinders water absorption by plants, since it increases the osmotic potential of the solution, besides causing morphological, structural and physiological changes. It is important to remember that water absorption by the roots occurs through osmosis, where water moves from a less concentrated medium to one more concentrated. In this context, a high concentration of salts in the soil/substrate solution can lead to root dehydration. Initially, for most plants, the symptoms of salt effect are leaf wilting in the warmer periods of the day, even if the soil is moist. Subsequently, burns occur in the apex and edges of the leaves and, ultimately, plant death.

Salinity may be due to natural processes or inadequate management of irrigation and fertilizers, which includes the amount applied and the choice of fertilizer. In this respect, ornamental plants with high demand of potassium, provided via potassium chloride at high doses and concentrations (low volume of soil), may have salinity problems, since this source has a high salt content.

Salts have the ability to conduct electrical current and their content is estimated by the electrical conductivity (EC), which can be measured by a device called conductivity meter. The EC should be determined in a water-saturated extract (soil:water ratio of 1:1 or 1:1.5) and the unit adopted by the International System is the Siemens (S), which can also be used to estimate the concentration of salts in: mg.dm-3 = microSiemens (µS)/cm x 0.64.

In horticulture, several guidelines are already known for the effect of salinity, such as the reduction of 10% in tomato yield for each 1 milliSiemens (mS)/cm above the limit tolerated by this crop. Unlike, for flowers and ornamental plants, knowledge is scarce; there is not even a complete classification of ornamental species for sensitivity to salt stress.

To mitigate the effects of the salinization of soils/substrates used in the production of ornamental plants, a leaching blade is recommended to remove excess salts and keep the nutrients in balance. Therefore, an effective drainage system is necessary, natural or artificial and, when calculating the blade, it is necessary to take into account the salt contents in the irrigation water, contents tolerated by the crop and water consumption by the plant.

In a production environment salinated with high levels of sodium (Na) in the sorption complex of soil/substrate (sodicity), the replacement by another cation is required, and calcium (Ca) is the most used. This should be done by associating a source of calcium with a leaching blade in a good drainage system. In this context, gypsum (CaSO4) is the most widely used due to its low cost, besides providing, at the same time, Ca, which displaces Na into the solution, and sulfate (SO4-2), which also favors the formation of sodium sulfates (Na2SO4) soluble in the solution. Both Ca and Na2SO4 are leached, thus obtaining the reduction in the contents of Na in the soil/substrate.

Given the above and considering the need for the production of flowers and ornamental plants of high quality, the importance of developing studies that take into account the salinity of soils and substrates is clear, since it is a limiting factor of production and there are still few studies in Brazil.

[1] Editor in the Area Propagation and Nutrition of Ornamental Horticulture. Professor, Universidade Federal de Goiás (UFG), Special Academic Unit of Agricultural Sciences, Jataí-GO, Brazil. leoflacar@yahoo.com.br