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Salt stress alleviation through fertilization in fruit crops

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OUTLINE

1 Introduction

Salt stress is one of the most widespread abiotic constraints in food production a tendency to increase due to climate change, increasing of the use of low-quality water in irrigation, and massive introduction of irrigation associated with intensive farming and low leaching fraction (Machado and Serralheiro, 2017).

Salts affecting soil root zone can be a natural process if they are originated in deeper layers of the soil, as often occurs in soils formed upon calcareous, limestones, and other calcic rocks. However, soil and water salinity is irrevocably associated with irrigated agriculture. With rainfed agriculture, the water used by the crops comes from the rain, free from salts, leaching from the root zone the salts eventually in excess. In nonirrigated lands as a result of water losses, through evapotranspiration situations of poor drainage, with water accumulating over slowly permeable soil layers containing salts, these can rise up to the root zone and accumulate there creating salt stress.

On the contrary, the irrigation water contains naturally dissolved minerals, which are usually added with salts to provide nutrients to the plants, which can affect plant growth and contribute to salt accumulation within the root zone. The use of chemical fertilizers to supplement soil fertility and to high-yielding crop requirements has been increasing rapidly due to the increase in intensive farming.

If drainage is limited, every excess of applied irrigation water will result in uprising of the soil water table, carrying salts from bottom layers to the root zone. Therefore, throughout the world, irrigation requires that salt management becomes an integral part of the production system (Ayars, 2003). As a major concern in irrigation water management,

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