

CLIMATE: SMART SOIL FERTILITY MANAGEMENT IN PERENNIAL FRUIT

A K Srivastava

ICAR-Central Citrus Research Institute, India

Soil is an environmental medium, playing a crucial role in soil C pool as the second biggest carbon pool through changes in soil fertility vis-a-vis crop performance. Different fruit crops sequestering 24-109 tons CO₂/ha displayed their ability to moderate climate change-related issues by elevating crop fertilising ability for improved plant nutrition and water-use-efficiency. Response of different fruit crops under elevated CO₂ condition is, therefore, a function of nutritional status of the crop. Our studies demonstrated the maximum nutrient demand at fruit set stage (Mar'-Ap' for winter crop and Aug'-Sep' for summer crop under sub-humid tropical climate of central India). Of late, certain citrus growing pockets of central India, irrespective of orchard nutrient status (possibility of disturbed K metabolism), exhibited abnormal fruit growth (greater growth along equatorial than radial axis), the exact cause-and-effect relation still remains quite elusive. Large difference in soil fertility of Ustorthent *versus* Haplustert indicated through greater increase in yield response at optimal fertilization at former soil type. However, the recommended dose of fertilizers (RDF) worked out in 1990-91 was no longer effective in 2010 onwards due to rise in average temperature by 1.5-2.0 °C during fruit set stage, necessitated addition at investment of 25% more K to moderate such temperature stress in citrus. How does RDF behave in the long run in different crops? Data accrued on response of organic manuring versus inorganic fertilizers demonstrated significant changes in important soil quality indices like soil microbial diversity, soil microbial biomass nutrient and organic carbon partitioning but without affecting fruit yield. The efficacy of rhizosphere- based microbial consortium aided in cutting down the rate of CO₂ release compared to inorganic fertilizers for storing large proportion of plant-derived C in long term C pools of soil, besides improvements in shelf life of fruits.

aksrivas2007@gmail.com