

## **SALTWATER CONTAMINATION IN THE VENICE LAGOON MARGIN, ITALY. 2: THE INFLUENCE ON THE SOIL PRODUCTIVITY. FIRST RESULTS**

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Salt accumulation in coastal soils is strongly affected by water dynamics in unsaturated and saturated zones. Rainfall and irrigation promote salt leaching contrasting the effect of upward flux from saline groundwater. Salinization degree and soil productivity depend by the final equilibrium between these two contrasting processes. This dynamic has been investigated in a farmland close to the Venice Lagoon. Indeed, the Venice watershed includes a very precarious coastal environment subject to both natural and anthropogenic changes with a significant and economically important fraction of the coastal farmland presently below mean sea level. In the hydrogeological context of the Venice coastland, a large risk of saltwater contamination characterizes the southernmost area because of the geomorphological setting of the coastal plain. Salt contamination is influenced also by the activity of several pumping stations used to keep drained the area, groundwater withdrawals, irrigation and freshwater releases during summer dry months. A 3-years project was started in 2010 to evaluate the impact of salt intrusion from the salty water bodies on soil productivity. In a 25 ha basin cultivated with maize crop, soil salinity (electrical conductance 1:2) and the main physical-chemical properties (e.g. texture, organic carbon and exchangeable cations) were measured along the 1.5 m soil profile in 120 positions. Maps of apparent electrical conductivity (ECa) at three different investigation depths (0 - 0.75 m; 0-1.50 m; 0- 6.00 m) were also obtained in April 2010 with a CMD electromagnetic conductivity meter (GF Instruments) associated to a DGPS. During 2010 some physiological crop parameters, in particular leaf potential, SPAD, reflectance (i.e. Spectrascan, Photoresearch), leaf ions content were monitored in 13 scattered positions. Moreover, maps of NDVI were obtained by proximal sensing (three dates) using an active spectral radiometer (Crop Circle, Holland Scientific) and remote sensing acquiring a WorldView 2 satellite image at the end of July. Finally, a map of the crop production was obtained by a yield mapping system mounted on a combine harvester. Relationships existing between soil and crop factors and crop yield were identified applying a multivariate spatial model, proving also the risk of salinization of the coastal area.