

DECEMBER 2023 NEWSLETTER

R E D O X P O T E N T I A L

CROPLAND WOULD LIKE TO **WISH ALL OUR CUSTOMERS AND EMPLOYEES A MERRY CHRISTMAS AND A PROSPEROUS NEW YEAR!** ITS BEEN ANOTHER GREAT YEAR AND WE CAN'T THANK EVERYONE THATS BEEN INVOLVED WITH OUR COMPANY ENOUGH FOR MAKING IT AN AMAZING YEAR!

Redox potential refers to the measure of the tendency of a chemical species to acquire electrons or lose them in a soil environment. In soil, redox potential plays a crucial role in determining the availability of nutrients, the presence of certain microbial populations, and the transformations of elements such as nitrogen, sulfur, iron, and manganese.

In terms of soil health, redox potential can indicate the level of soil aeration and drainage. Well-aerated soils tend to have higher redox potentials, indicating oxygen-rich conditions, which are beneficial for the growth of aerobic organisms and the availability of certain nutrients in their oxidized forms. Conversely, low redox potentials suggest reduced or anaerobic conditions where oxygen is limited.

Anaerobic soils and high alkaline soils (over 7.5 pH) have low redox potentials, indicating reduced conditions where oxygen is limited or absent. The redox potential in anaerobic soils can vary widely depending on factors such as water saturation, organic matter content, microbial activity, and the presence of certain minerals. In extremely waterlogged or saturated soils, the lack of oxygen leads to a decrease in redox potential. The values can range from negative to relatively low positive values, such as -200 mV to +300 mV or even lower, indicating reducing conditions.

In acidic soils, the redox potential can vary based on several factors, including the pH level, the presence of organic matter, and drainage conditions. Acidic soils typically have a pH below 7, which can impact the redox potential in various ways. The redox potential in acidic soils can vary widely, but it tends to be more positive (indicating oxidized conditions) compared to extremely low pH soils or waterlogged environments, which might exhibit lower redox potentials due to restricted oxygen availability. However, specific redox potential values in acidic soils can range widely, typically falling within the range of -200 mV to +400 mV or even higher in well-aerated, moderately acidic soils.

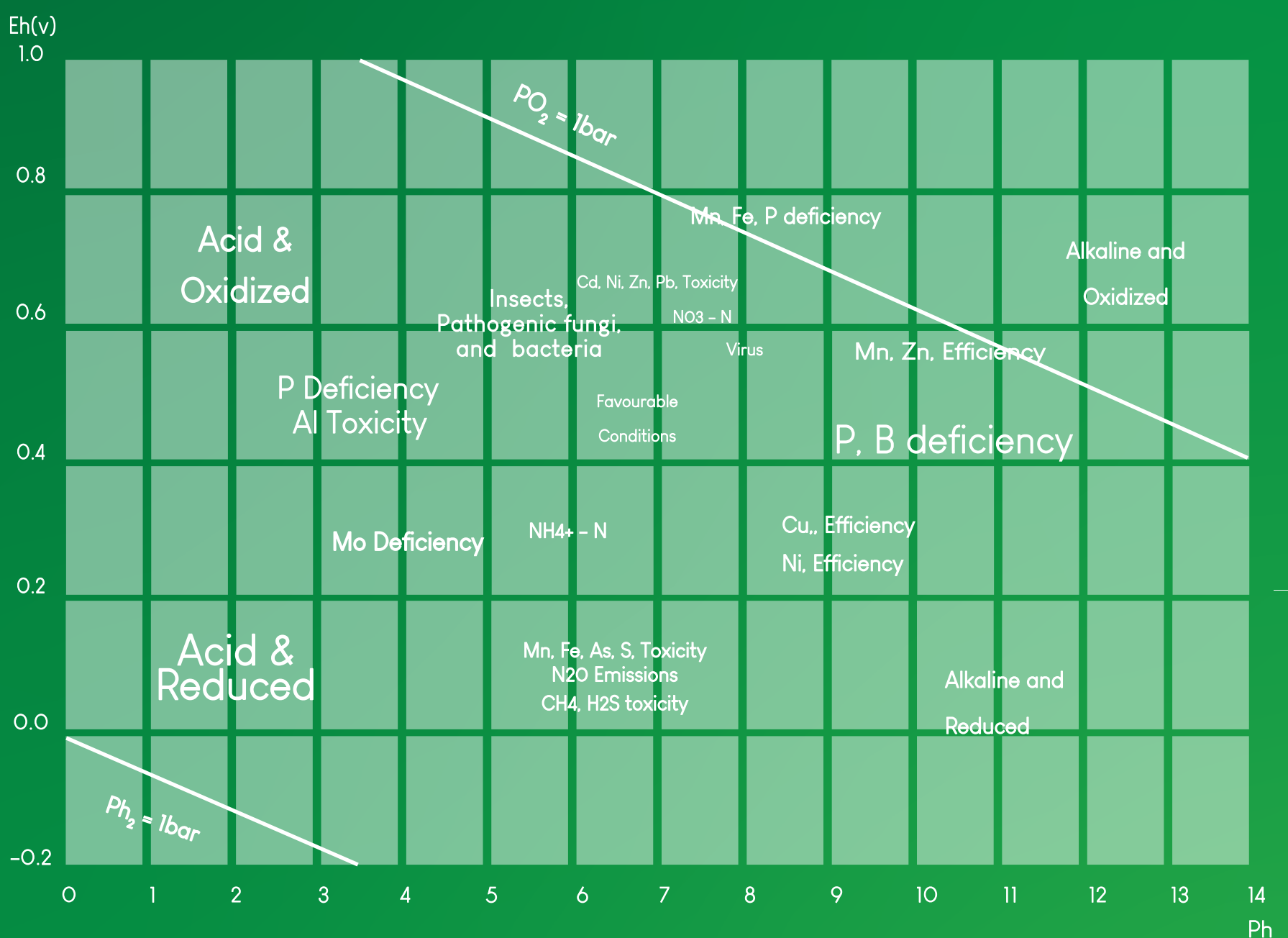


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The ideal redox potential for plant growth can vary depending on the specific plant species and the soil conditions they prefer. Generally, most plants thrive in soils with moderately oxidized conditions, where there's enough oxygen available for root respiration and nutrient uptake, but not excessively high that it leads to nutrient leaching. For many plants, a redox potential ranging between +300 mV to +500 mV (millivolts) is considered favorable. This range indicates well-aerated soil with adequate oxygen levels, allowing for good root growth, microbial activity, and nutrient availability in their oxidized forms



Husson, O. Redox potential (Eh) and pH as drivers of soil/plant/microorganism systems: a transdisciplinary overview pointing to integrative opportunities for agronomy.

Plant Soil 362, 389–

417 (2013). <https://doi.org/10.1007/s11104-012-1429-7>

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