Progyp™

"A Soil and Plant Fertility Product"

Defining pH and Soil Acidity

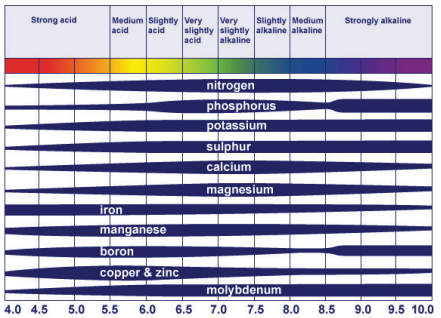
Introduction:

Favorable pH ranges for common crops

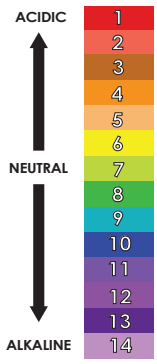
CROP	SOIL pH 5.0	5.5	6.0	6.5	7.0
CORN			■	■	
ALFALFA				■	
SOYBEANS				■	
WHEAT			■	■	
OATS		■	■	■	
BARLEY				■	
RED CLOVER			■	■	
GRASSES			■	■	

Soil acidity is among the most important environmental factors which can influence soil properties and productivity, nutrient uptake and efficiency and crop production.

Both macronutrient and micronutrient availability are affected by soil pH. In slightly to moderately alkaline soils, molybdenum and macronutrient (except for phosphorus) availability is increased, but P, Fe, Mn, Zn Cu, and Co levels are reduced and may adversely affect plant growth. In acidic soils, micronutrient availability (except for Mo and Bo) is increased. Nitrogen is supplied as ammonium (NH4) or nitrate (NO3) in fertilizer amendments, and dissolved N will have the highest concentrations in soil with pH 6–8. Concentrations of available N are less sensitive to pH than concentration of available P. In order for P to be available for plants, soil pH needs to be in the range 6.0 and 7.5. If pH is lower than 6, P starts forming insoluble compounds with iron (Fe) and aluminium (Al) and if pH is higher than 7.5 P starts forming insoluble compounds with calcium (Ca). Most nutrient deficiencies can be avoided between a pH range of 5.5 to 6.5, provided that soil minerals and organic matter contain the essential nutrients to begin with.

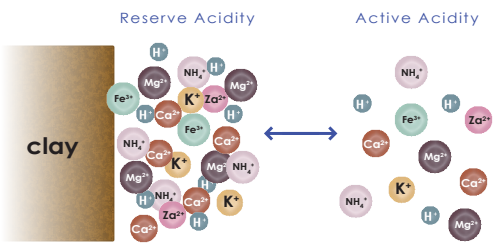


pH and Soil Acidity:



The pH of a soil refers to how acid or alkaline the soil is. The letters "pH" means "potential hydrogen." The acidity-alkalinity scale ranges from 0 to 14. Soils are referred to as being acid, neutral, or alkaline, depending on their pH levels. A pH of 7 is neutral, while a pH lower than 7 is acid, and a pH higher than 7 is alkaline (basic). A logarithmic scale is used to measure a soil's pH. That is, a change of one unit in the pH scale represents a 10-fold change in acidity or alkalinity. A soil with a pH of 5.0 is 10 times more acidic than a soil with a pH of 6.0 and 100 times more acidic than a soil with a pH of 7.0. Plants have specific pH requirements for normal growth which is a good reason to be very careful in trying to increase or lower soil pH.

Soil acidity is comprised of two components: active acidity and exchangeable (reserve) acidity. Active acidity is the concentration of H^+ ion in the solution phase of the soil and is measured by pH but is not a measure of the total soil acidity. The soil pH is a general indicator of whether lime is needed to reduce the acidity. The exchangeable acidity refers to the amount of H^+ ions on cation exchange sites of negatively charged clay and organic matter fractions of the soil. Soil exchangeable acidity determines the amount of lime necessary to increase the soil pH. Therefore, soil test reports show both soil pH and exchangeable acidity and a lime recommendation based on this total acidity.



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