

Reaction (water pH) of the A, B and C horizons

A soil's pH value, as measured in water, expresses the soil's degree of acidity or alkalinity. The pH value is a measure of active hydrogen, which largely controls the activity and equilibrium of the various elements that condition the way the soil functions (Magny and Baur 1962). It affects the uptake and availability of various nutrients, and acts on the toxicity of other elements. It follows that pH is a crucial factor for soil fertility and plant growth.

Table 1. Definition of reaction (water pH) classes

pH class	Water pH
Extremely acidic	<4.6
Very strongly acidic	4.6 - 5.0
Strongly acidic	5.0 - 5.5
Moderately acidic	5.5 - 6.0
Weakly acidic	6.0 - 6.5
Neutral	6.5 - 7.4
Weakly alkaline	7.4 - 7.9
Moderately alkaline	7.9 - 8.4
Strongly alkaline	≥8.4

Day and McMenamin 1983

There are nine reaction (water pH) classes (Table 1). The optimal water pH value is between 6.0 and 7.0 for most crops.

Forest soils are naturally at least one class more acidic than the same soils planted in crops.

The pH of the A horizon in soils in the southeastern part of the Montreal plain is generally more acidic than the pH of the underlying layers (B and C horizons). For the most part, it ranges from moderately acidic (36.9%) (e.g. Saint-Aimé series) or weakly acidic (31.3%) (e.g. Providence series) to neutral (18.3%) (e.g. Saint-Urbain series). Strongly to very

strongly acidic soils account for 13.5% of the study area. These are organic soils and sandy podzolic or brunisolic soils for the most part (e.g. Ste-Julie series).

Coarse-textured soils are more acidic than medium- or fine-textured soils, as the former are more heavily leached. The pH becomes neutral to alkaline in the B horizon, and this phenomenon is even more marked in the substratum, owing to the presence of carbonates, except in deep organic soils, which remain extremely acidic.