

Soil organic carbon (SOC) is crucial for soil health, impacting physical, chemical, and biological properties. It improves soil structure, water retention, nutrient retention, and biological diversity, leading to better crop yields and reduced erosion. The Walkley–Black method is a standard technique for determining SOC. It involves oxidizing soil organic matter with potassium dichromate ( $K_2Cr_2O_7$ ) in the presence of sulfuric acid ( $H_2SO_4$ ), then titrating the remaining dichromate with ferrous sulfate. The amount of dichromate consumed is inversely proportional to the SOC content.