Article title	Underestimation of Available Phosphorus by Resin–Bicarbonate and Olsen Tests in Calcareous Soils treated with Gypsum
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Keywords	Calcite, Gypsiferous soils, Resins
Abstract	In the present study, Olsen [0.5 M sodium bicarbonate (NaHCO3), pH 8.5] and resin–bicarbonate (HCO3) tests underestimated available phosphorus (P) in calcareous soils treated with gypsum (CaSO4). The reaction of CaSO4 and HCO3 − ion or resin–HCO3 to form calcium carbonate (CaCO3) precipitate reduced the strength of the Olsen NaHCO3 extractant and resin–HCO3 strip for P extraction. The iron (Fe) oxide–impregnated filter paper (Pi strip) was independent of CaSO4 influence and thus correctly estimated soil-available P with respect to plant response to soil-available P. Two greenhouse experiments were conducted with maize and wheat grown on calcareous soils treated with different rates of CaSO4. The results confirmed that Olsen and resin–HCO3 tests should not be used to measure available P or labile P in the P fractionation scheme in the calcareous soils containing significant amounts of gypsum.
Publication date	2009-06-04
Citation	S. H. Chien , E. R. Austin & C. G. Calvo (2009) Underestimation of Available Phosphorus by Resin–Bicarbonate and Olsen Tests in Calcareous Soils treated with Gypsum, Communications in Soil Science and Plant Analysis, 40:11-12, 1924-1936, DOI: 10.1080/00103620902896803
Article link	https://doi.org/10.1080/00103620902896803