Extraction with 0.01 M $CaCl_2$ generally results in underestimation of soil solution P concentration

del Campillo MC, Sánchez-Alcalá I and Torrent J

Dpto. de Agronomía, Edificio C4, Campus de Rabanales, Universidad de Córdoba, 14071 Córdoba, Spain *(e-mail: campi@uco.es)*

Water and 0.01 M $CaCl_2$ are the extractants commonly used in tests measuring the intensity factor of soil P. The latter has been used for more than 50 years on the basis of its similitude to the solution of most agricultural soils. Although water and 0.01 M $CaCl_2$ extractable P have been found to be correlated, the concentration of P in the water extract is generally several times greater than that in the 0.01 M $CaCl_2$ extract. This discrepancy can be partly ascribed to the different ionic strength and composition of the two extracting solutions. We measured the P extracted by a salt solution similar in ionic composition and strength to the soil solution.

AIM: To find out to which extent the extractions with water and 0.01 M $CaCl_2$ offer a view of the actual concentration of P in the soil solution

MATERIAL AND METHODS

70 Spanish soils

P extracted by **water** and a **salt solution** of similar in ionic composition and strength to the soil solution for 3 days

A 30-min extraction with **0.01 M $CaCl_2$** was used as the reference method

using a soil:solution of 1:10 at 25 ºC

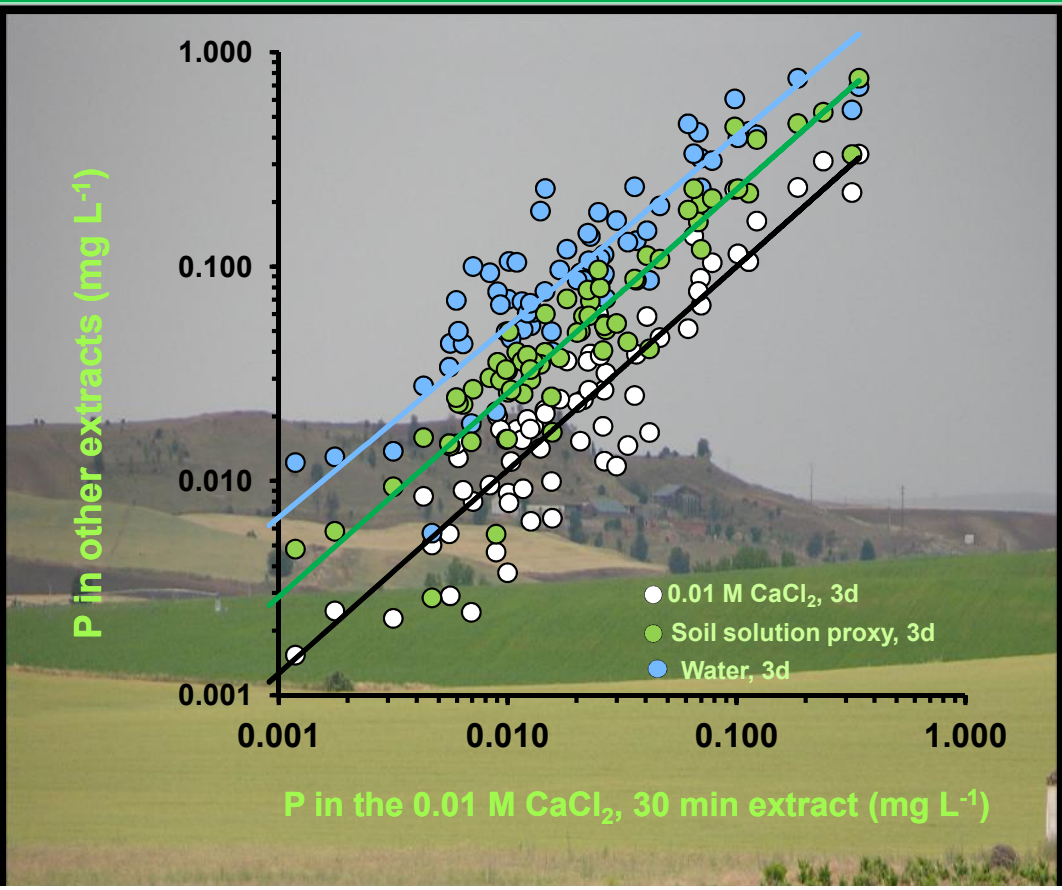
RESULTS

Extraction time had little influence on 0.01 M $CaCl_2$ extractable P.

Water extractable P was about 2.3 times the soil solution proxy extractable P.

0.01 M $CaCl_2$ extractable P was about 0.4 times the soil solution proxy extractable P.

The ratio between 0.01 M $CaCl_2$ extractable P and soil solution proxy extractable P approached 1 as the ionic strength of the soil solution approached that of 0.01 M $CaCl_2$.



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