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## Pigeon Pea and Chickpea Release Phosphates

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We all know that legumes such as these two plants add nitrogen to the soil. Now scientists at ICRISAT in India have shown that they make available more phosphates. They do not add phosphate to the soil, but rather break up phosphate compounds in such a manner that phosphate that was already present but unusable by plants is now available. If you work where phosphate is one of the most limiting nutrients (a common situation in tropical soils), you might want to work these crops into your rotation.

How do they work? Studies show that the roots of pigeon pea exude acids (piscidic acid) which release phosphorous when it is bound up with iron. Chick peas release another acid (mallic acid) from both roots and shoots. In calcareous soils (alkaline soils with high calcium content), this acid breaks up insoluble calcium phosphate. Normally this release would only occur if the Ph of the soil were lowered.

Both plants "are deep rooted, so their ability to release more phosphates means that valuable nutrients are being brought up from the deeper soil layers. Residues from both crops are adding extra phosphates which will benefit the crops which follow in the rotation. It is possible that some varieties ... exude more acid than others. So this trait could be another characteristic for selection [by plant breeders]."