Organic wastes as phosphorous fertilizers in organic agriculture

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Phosphorous (P) should be recycled from organic wastes as much as possible to reduce mining of P reserves and eutrophication. In stockless organic agriculture P input is needed. Here we assessed 7 organic residues and compared them to mineral P fertilizer and rock phosphate (allowed in organic agriculture). Barley was grown with optimal fertilization of all other nutrients in a sand/peat mixture. Total P in organic P sources and rock phosphate equaled optimal supply if all was available. This was compared to no P, half optimal and optimal supply of mineral P. The best availability was found in digested liquid manure (growth 95% of that with optimal P supply). Wood ash, fish sludge composted solid manure and composted food waste sustained growth of 65-79% of that with optimal P supply. Meat and bone meal and the commercially available product ladybug and rock phosphate had low P availability (growth 30-35% of optimal) at the same level as no P (32%). The results indicate that that some organic phosphorous sources can supply the crop with sufficient P without leading to P accumulation, but some commercially available sources performed poorly.