

Variable rate application of manure – gain or pain?

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In intensive agricultural livestock production manure is often treated as a waste problem rather than an organic fertilizer and source of nutrients. Even if maximum loads will not exceed an upper limit of 170 kg/ha nitrogen, its use is not sustainable as phosphorus is applied at rates that outreach crop demand by far. With view to worldwide finite mineral rock phosphates efficient measures to close the agricultural phosphorus cycle are required and the revision of current practices of manure application is urgently requested. A solution to the problem offers the variable rate application of manures if upper nutrient loads are restricted to an average phosphorus off-take of 22 kg/ha by agricultural crops and recycling chains for excess manure are implemented. The presented study demonstrates the problem of phosphorus accumulation in soils of livestock farms, addresses the spatial variation of plant available phosphorus in soils, identifies relevant factors that influence the mineral composition of manure and provides algorithms for a balanced, variable rate fertilization of manure.