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Sustainability versus yield in agricultural soils under various crop production practices - a microbial perspective

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Wheat and cotton are important food and cash crops often grown in rotation on black, grey and red clay soil, in Australia. The common practice of nitrogen and phosphate fertilizers have been solely in the form of agrochemicals, however, a few growers have incorporated manure or composted plant material into the soil before planting. While the cotton yield in studied farms was comparable, we found that the use of such organic amendments significantly enhanced the pool of nitrogen cycling genes, suggesting increased potential of soil microbial function as well as increased microbial metabolic diversity and abundance. Therefore, the regular use of organic amendments contributed to improved soil sustainability.