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RECYCLED BY-PRODUCTS CAN MAKE POSITIVE CONTRIBUTIONS TO THE
YIELD AND NUTRITIONAL COMPOSITION OF GRASS-CLOVER LEYS

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Four selected by-products (biogas digestate, pot ale, wood ash and rockdust) were tested for their fertiliser value to a mixed perennial ryegrass–red clover crop in terms of crop performance (yield and botanical composition) and mineral quality. To render the results relevant to production systems on marginal land, two inherently low-fertility soils were used for the 14 months pot experiment. A number of nutrients of interest in high-yielding dairy production were determined in plants and soils: N, P, K, Ca, Mg, Na, Co, Cu, Mn, Mo, Ni and Zn. All tested by-products increased overall yield and affected nutrient concentrations of the individual plant species. The effects differed between the grass and clover, though, which lead to changes in botanical composition indirectly affecting the nutrient concentrations of the mixed crop. Individual by-products increased concentrations of Cu, Mg, Na and/or Zn to close to or over the recommended minimum concentrations. There is thus potential to enhance agricultural productivity on marginal land through improved forage production and quality by matching of by-products, soils and forage species/mixtures. However, to secure sustainable use of by-products as fertilisers or soil amendments, soil quality must be considered and monitored in addition to crop quality, e.g. by using element balances.

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