

Suggestion for poster presentation:

Extraction tests in predicting potential phosphorus load from pasture soil

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The agriculture has major role in non-point nutrient loading into watershed. The objective of this work was to examine the effects of urine and dung additions on the P released from the pasture land and to compare the sensitivity of different extraction methods (P_{Ac} used for soil testing in Finland and P_w used for soil testing in Netherlands) in assessing the P loading risk. Phosphorus desorption is enhanced by increase in pH. This is due to the increase in the negative charge of the adsorbing oxides. It has been found that increase in pH caused by urea hydrolysis leads contemporary increase in mobility of P and DOC in the soil.

This study was done in a field by adding to the soil urine and dung in quantities corresponding to single excrement portion. Soil sampling in the urine and control patches were done 0, 1, 3, 5, 10, 21, 49, 77 and 120 days after the onset of the experiment. The sampling of the dung patches started on the day 3 and continued as above. Sampling depths were 0-2, 2-10 and 10-25 cm. The samples were analyzed for pH_{H_2O} , water extractable molybdate reactive P (MRP) and total water extractable P (TP), and acid ammonium acetate extractable P (P_{Ac}).

The preliminary test showed that the effect of urine and dung could only be seen in the two upper layers of soil. Urine additions increased the soil pH immediately after the addition, but the effect vanished after 10 days. The effect of dung on pH was not statistically significant. The concentration of MRP followed closely the urine induced increase in pH. Similar increase could not be detected in the concentrations of P_{Ac} . This response was not seen in P_{Ac} extraction where the low pH (4,65) enhanced the resorption of P. According to these results water extraction is superior to P_{Ac} test when estimating short-term changes in P solubility. When estimating possible need for fertilization of pasture land and pasture land as a source of leachable P, the pH rise and following increase in soluble P in feeding areas should be taken into account. The impact of cattle excrement should be carefully investigated before recommending grazing on buffer zones.