

1.79 Problems with phosphorus supply in grassland soils of Austria

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Recent analyses of soil sample data clearly indicate that a high proportion of grassland soils in Austria show a very low resp. low content of phosphorus. This might result in insufficient yields, unfavourable growing conditions of legumes and decreasing forage quality. Organic farms and other low input farming systems which are an essential part of Austrian agriculture are strongly dependent on sufficient yields and high quality of home-grown forage from meadows and pastures. The Austrian agri-environmental programme ÖPUL includes some restrictions in the use of specific phosphorus fertilisers. Easy soluble and highly efficient phosphorus fertilisers like super-phosphate or triple-phosphate are not allowed for organic farming and

some other measures within ÖPUL. Alternative phosphorus fertilisers mostly originating from raw phosphates are „slow release“ products and additionally ineffective at high pH-values. Moreover, in most cases high pH coincides with low phosphorus content in soil. Nevertheless, an objective analysis of the current situation shows that there is neither a need for changing the system for classifying the P-supply nor for increasing the fertiliser recommendations for phosphorus. The existing supplement system based on soil phosphorus analyses can still be regarded as a reliable instrument but has to be promoted much more in practice.

1.80 The influence of way and intensity of grassland management to ground water contamination with nitrates

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The effect of fertilization and way and frequency of exploitation of permanent grassland (*Lolio-Cynosuretum* association) in the foothill regions of the Šumava (South Bohemia, 650 m a.s.l.) on changes of NO_3^- concentration in ground waters was studied in years 2006 to 2009. The values of NO_3^- concentration in ground waters showed logarithmic-normal distribution for all the tested alternatives. The higher frequency of exploitation seems to be optimal for both the moving and grazing alternatives (mowing 3x per year or 3 but better 4 grazing cycles per year). The application of $100 \text{ kg N} \cdot \text{ha}^{-1}$ (PK) facilitates to decrease the mean values of NO_3^- concentration ($\bar{x} \leq 1.629 \text{ mg NO}_3^- \cdot \text{l}^{-1}$) here with the simultaneous increase of probability $[F(x) \geq 0,982]$ of unexceeding the value of NO_3^- concentration that is demanded for suckling water ($15 \text{ mg NO}_3^- \cdot \text{l}^{-1}$) with values of fractiles $x_{0,95} \leq 7.516 \text{ mg NO}_3^- \cdot \text{l}^{-1}$. The combination of mulching (at the beginning of May) mowing proved to be optimal for extensive alternatives ($\bar{x} = 0.987 \text{ mg NO}_3^- \cdot \text{l}^{-1}$). Fertilization makes the quality of ground waters considerably worse in the case of extensively grazingly exploited stands.