Changes in soil P status of grassland in the Netherlands between 1971 and 2009

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Here we report on soil P status in farmers' grasslands in the Netherlands.
Specific objectives were to examine:
i) differences between soil type and soil P status
ii) effect national manure policy on soil P status

Materials and Methods

- Data were taken from BLGG AgroXpertus (blgg.agroxpertus.nl) with approx. 2 million records.
- P-Al value was used as indicator (mg P_2O_5 per 100 g air dry soil).
- We confirmed the representativeness of our data statistically by comparing the P-Al values between 'regular' clients with a set of (incidental) 'new' clients (results not shown here; see Reijneveld et al., in press).

Results and Discussion

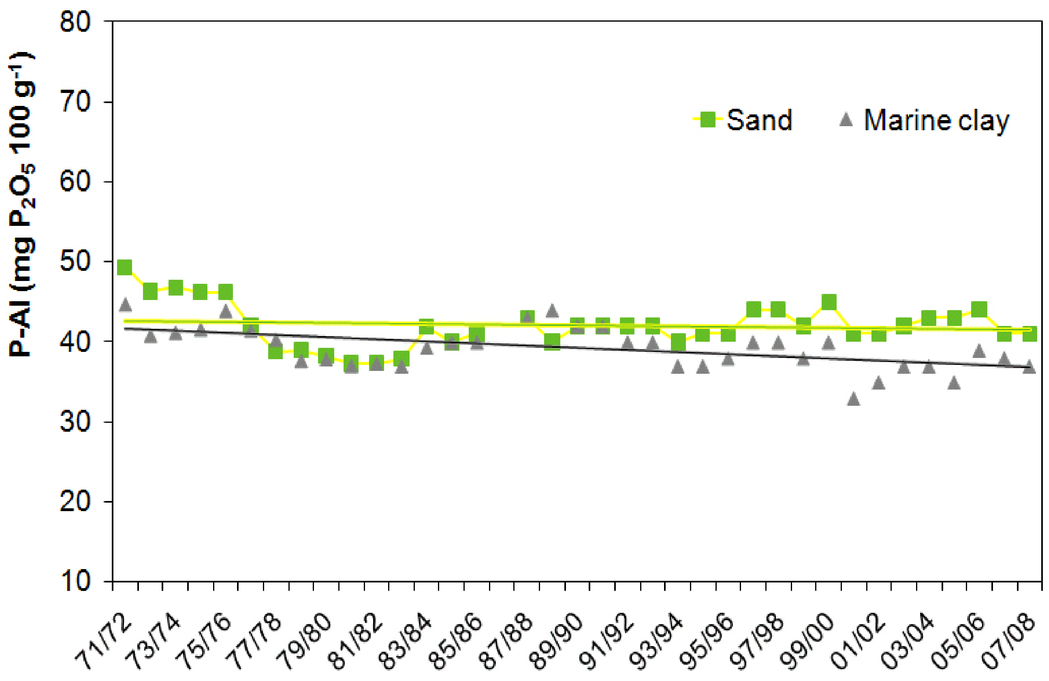

Fig. 1. Development in mean soil P-Al for sandy and marine clay soils during 1971-2009.

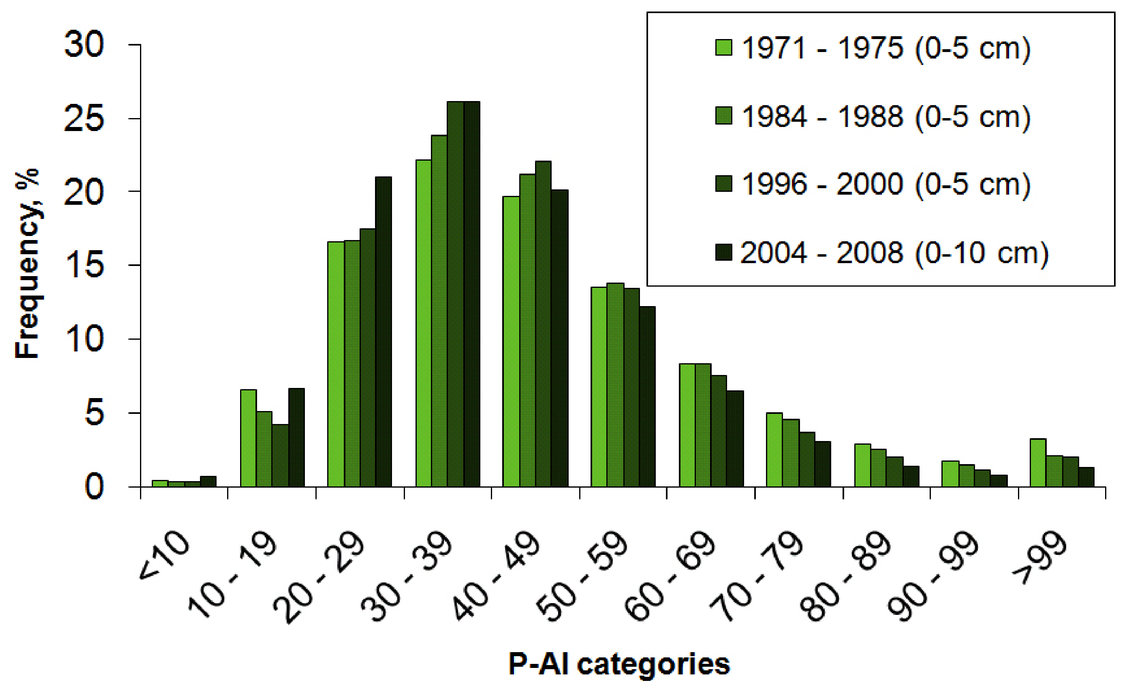

Fig. 2. Frequency distribution of P-Al (mg P_2O_5 per 100 g soil) for marine clay soils.

Median P-Al values ranged between 33 and 49 mg P_2O_5 per 100 g soil in the period 1971 – 2009 (Fig. 1); this is roughly the agronomical optimal range.

The rather slight change in soil P status with time can be explained by:

- Leaching to the subsoil.
- Deeper ploughing and reseeding.
- Transformation to non-extractable soil P forms.
- Fewer soil tests provided by farmers that are high in soil P status.

-Within soil types large variation occurs (shown in Fig. 2 for marine clay).
- Between soil types, median P-Al decreases in the order sand > peat soils > clay > loess.

Conclusions

- In 1971-2009, median soil P status has remained quite constant in Dutch grasslands.
- Current soil P status is in the agronomic optimal range.
- Although manure policy from 1984 onwards has limited aplication rates, median soil P status had not changed since then.
- Variation between fields and soil types appeared considerable.

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Reference

Reijneveld, J.A., Ehlert, P.A.I., Termorshuizen, A.J. and Oenema, O. (2010) Changes in soil phosphorus status of agricultural land in the Netherlands in the 20th century. Soil Use and Management (accepted).

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