The effect of carbon on grass-encroachment in the Dutch coastal dunes:  
A case study in the Amsterdamse Waterleidingduinen

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Abstract
The Dutch coastal dune system is an important and unique ecosystem for the Netherlands (and Europe). Over the years the dune-ecosystem has changed and problems like grass-encroachment started to occur. This research will try to improve understanding the changes in dune-ecosystem and the causes of grass-encroachment. We looked at Phosphorus and Nitrogen fractions in the dune-topsoil in different circumstances. In more detail we looked at the impact of lime-richness and organic matter richness on different P-fractions in the soil. We found that:

1. Available P was already high in lime-rich soils with low organic matter content, the least developed soils.
3. Several P-fractions were regulated by lime-richness: P-total, P-available and microbial P
4. SOM is also important, especially for the balance between organic and mineral P, and organic, mineral and total Fe.
5. SOM does not cause any problems in lime-rich soils as long as the pH is kept high.
6. Lime-poor soils change due to increase in SOM. The soil acidifies and causes P to bond to complex Fe-Organic matter complexes.