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# Interlinked changes in the environment and crop production through the Neolithic in northern Germany

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## Résumé

The introduction of agriculture in the Neolithic marked the start of major alterations of the natural environment including deforestation and soil erosion. Human exploitation of natural resources and the effect on the environment during the Neolithic in northern Germany have been thoroughly investigated using high-resolution palaeoecological, archaeobotanical, geomorphological and archaeological data. Changes over time have been detected in the natural landscapes resulting from human activities, most prominently agriculture. The combined evidence suggests limited anthropogenic (e.g. farming) impact at the beginning of the regional Neolithic (Early Neolithic Ia), around 4100 cal BC, with some changes in woodland composition. A sharp rise in landscape openness in the Early Neolithic Ib (from c. 3800 cal BC) has been identified, coinciding with the emergence of the tradition of building megalithic graves. The degree of land use was lower at the start of the Middle Neolithic (around 3250 cal BC) perhaps due to climate deterioration, but was on the increase again across the region for about a century during this period. Towards the end of the Middle Neolithic, at around 3000 cal BC, a decline in human activity favoured woodland regeneration. This was followed by a series of alternating phases of landscape opening vs. forest regeneration through the Late Neolithic.

The major shifts in climate and vegetation likely coincided with changes in the agricultural practice. However, beyond the recognition of shifts through time in the vegetation composition and distribution, and the crop spectrum, little is known about the actual farming and land management strategies that drove and/or were affected by the changes. This paper addresses the questions of how and to what extent early farmers modified the natural surroundings in this region. It seeks to pinpoint specific agricultural and land use methods

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towards a better understanding of the ecological concomitants of prehistoric farming. The paper integrates the previous data on the Neolithic in northern Germany and presents new evidence derived from the ecological and stable isotopic analysis of plant macro-remains. The results included in the paper derive from research funded by the *Deutsche Forschungsgemeinschaft* (DFG, German Research Foundation) and carried out within the Kiel University projects ‘SPP1400: Early Monumentality’ and ‘SFB1266: Scales of Transformation’.

**Mots-Clés:** Neolithic, environmental change, deforestation, crop cultivation, land management