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INVENTORY OF POTENTIAL ECOLOGICAL FOCUS AREAS (EFA) IN AGRICULTURAL LANDSCAPES IN THE CONTEXT OF THE COMMON AGRICULTURAL POLICY (CAP) REFORM

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ABSTRACT:
According to the EU Commission, direct payments to farmers should be linked to ecological measures (CAP Greening). One component is the establishment of ecological focus areas (EFA) within agricultural landscapes.
The aim of this study is to identify site-specific marginal areas in agricultural sites, which could be designated as potential ecological focus areas from an agronomic and landscape-ecological perspective. These areas are mainly characterized by abiotic factors that cause plant stress (reduced water capacity, soil properties etc.). These small-scale growing anomalies will be inventoried based on multi-spectral satellite imagery. The study areas (16,200 km²) are located in Brandenburg and Mecklenburg-Vorpommern, both in Germany, and are characterized by glacially formed dry sandy sites which have low nutrient supply and poor water capacity. Different vegetation indices (NDVI, NREVI and Nitrogen Reflectance Index) were calculated on the basis of high-resolution RapidEye imagery in order to assess marginal sites within predefined field blocks. Object-based hierarchical classification of site-specific areas within a field block (super-object) was conducted based on a robust statistical approach by comparing sub-object vegetation indices across the entire block. Sub-object statistics of vegetation indices were compared to those of the field block in order to derive relative deviations. Four different classes were then defined using relative deviation threshold values based on overall field block indices. The resulting processing method proofed to be transferable to RapidEye scenes from different acquisitions dates. These results can be used by decision makers and stakeholders responsible for protecting and increasing agro-biodiversity (e.g. inventory of EFA, sustainable plant protection strategies and integrated pest management).

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