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ASSESSMENT OF THE SUSTAINABILITY OF THREE SELECTED FARMS IN THE SOUTHWESTERN SIBERIAN STEPPE ZONE USING THE "REPRO" FARM MANAGEMENT MODEL

BEWERTUNG DER NACHHALTIGKEIT DREIER AUSGEWÄHLTER LANDWIRTSCHAFTLICHER GROSSBETRIEBE IN DER SÜDWESTSIBIRISCHEN STEPPE MIT HILFE DES BETRIEBSMANAGEMENT-MODELLS „REPRO"

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SUMMARY

The Kulunda steppe in the Russian Federation is of great importance for grain production. However, the Russian steppe belt in general and this steppe in particular have received little attention in the literature and in agricultural modelling. Here, with strongly continental, semi-arid climate, at Chernozems and Kastanozems, mainly summer crops are cultivated. The intensive land use is not adapted to the site conditions, which results in large-scale soil degradation. Sustainable land use is often ignored by farmers, who usually only focus on day-to-day business. In this study, we use the REPRO environmental balancing model for a sustainability analysis of three selected experimental farms in different steppe zones. The nutrient supply (humus, nitrogen, phosphorus), energy intensity and greenhouse gas emissions are modelled. The humus and nutrient supply can be assessed as stable due to a favorable natural environment. Contrary, energy intensity and greenhouse gas emission level reveal a poor sustainability level at all modelled farms. We would like to contribute an approach for modelling complex large farms and draw attention to the difficulties.

Keywords: Russia, Steppe, Sustainable Agriculture, Farm Modeling, Nutrients, REPRO

ZUSAMMENFASSUNG

Die in der Russischen Föderation gelegene Kulunda-Steppe ist für die Getreideproduktion von großer Bedeutung. Der russische Steppengürtel im Allgemeinen und diese Steppe im Besonderen haben jedoch in der Literatur und in der landwirtschaftlichen Modellierung we-