

USE OF NDVI TO FORECAST THE YIELD OF SPRING BARLEY IN THE NORTH-WEST REGION OF RUSSIA

M. A. Fesenko, A. M. Shpanev

*Agrophysical Research Institute,
14, Grazhdanskiy pr., Saint-Petersburg, 195220,
E-mail: ramylek@yandex.ru; ashpanev@mail.ru*

In the North-West of Russia, the possibility of using NDVI for predicting the yield of spring barley has been studied for 5 years. Monitoring was carried out weekly by the Greenseeker handheld crop sensor at the experimental plots with different rates of mineral fertilizer application and different plant-protecting technologies. The long-term and seasonal dynamics of spring barley crop NDVI were affected more by the annual weather conditions and less – by the applied treatments. The correlation coefficient between grain productivity and the total weight of spring barley plants (without grain) was 0.87 on average, the harvest index was 0.26. The yield varied from 2.1 to 4.1 t ha⁻¹. The relationship of the yield of spring barley with the vegetation index was significant, starting from the 4th week from germination and until the end of the growing season. The maximum tightness of the connection ($R = 0.57\text{--}0.67$) was recorded from the 5th to the 7th week of vegetation. Regression equations were constructed between the NDVI indicators at different dates and the yield of spring barley. The predictive value of spring barley yield models based only on NDVI is low ($R^2 = 0.46$). The use of mineral fertilizers led to an increase in NDVI. The use of herbicides did not result in any significant differences in the value of the vegetation index. The relationship between the value of the vegetation index and the yield of spring barley increases with an increase in the level of mineral nutrition. The quality of the forecast may depend on the barley variety.

Key words: vegetation index NDVI, spring barley, application of mineral fertilizers, plant protection system.