

Usefulness of plant tests for evaluation the nitrogen nutritional status of winter wheat and maize, editors Pecio A., Mikołowicz P., Fotyma M.

Mikołowicz P., Pecio A. Plant tests for evaluation the nitrogen requirements of winter wheat and maize , str. 5

Abstract

In this paper the results of field and laboratory experiments carried on in the years 2005 – 2006 in two Experimental Stations on the four plant tests for evaluating the nitrogen nutritional status of winter wheat and maize are presented. The tests in comparison were: nitrogen concentration N_{tot} in plant dry matter, NNI index, SPAD index and NDVI index. These tests performed at shooting stage and blooming stage of winter wheat and at silking stage of maize were calibrated against the relative yield of grain, optimal dose of nitrogen calculated from QUADMOD model N_{crit} and against the NNI index. The critical values for N_{tot} and SPAD tests are proposed as well as the very preliminary values for NDVI tests. The principles of NNI test and NDVI test were broadly discussed, the later with description of the new in Poland instrument Green-SeekerTM. Three methods of tests calibration proved the full and similar usability for this purpose.

Key words : plant tests, NNI, SPAD, model QUADMOD, NDVI

Pecio A., Fotyma M. Stability of plant nitrogen nutritional indexes , str. 102

Abstract

The hypothesis that the selection and calibration of plant tests should be focused on the plant growth (accumulation of dry mass and-or plant size) and not on the plant development (passing the growth stages) was tested in field experiments carried on in the years 2008 – 2009 at two Experimental Stations. The unique scheme of experiments, permitting to verify this hypothesis was presented in the previous paper (this volume). The following plant tests have been checked: nitrogen concentration in plant dry mass N_{tot} , NNI index, SPAD index and NDVI index. The most appropriate plant test, which values depends only slightly on the accumulation of plant dry mass proved to be NNI, hence confirming the sound theoretical basis underlying this test. The next was SPAD test reasonably stable in course of the whole vegetative period of plant growth. Nitrogen concentration in dry mass N_{tot}

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and NDVI index changed a lot together with accumulation of plant dry matter and do not fit to the new approach to plant analysis.

Key words: plant growth, plant development, plant tests, nitrogen