

## TESTY GLEBOWE POTASU ŁATWO DOSTĘPNEGO DLA ROŚLIN-Mariusz Fotyma

### Abstrakt

W pracy przedstawiono wyniki badań laboratoryjnych nad porównaniem 5 metod oznaczania zawartości przyswajalnego potasu w glebie (K wymienny, metoda CAL, DL, AL i metoda Mehlich). Badania prowadzono na 132 próbkach gleby pobranych z obiektów z nawożeniem i bez nawożenia potasem, wieloletnich doświadczeń nawozowych prowadzonych w 9 krajach europejskich. Ilości ekstrahowanego potasu układały się w ciąg rosnący: CAL < Kwym = DL = Mehlich < Al. Najsilniejsza korelacja występowała pomiędzy metodami Kwym i DL oraz Kwym i Mehlich. Zawartość potasu wymiennego w glebach przez wiele lat nienawożonych tym składnikiem pozostawała w granicach 50 mg K·kg<sup>-1</sup> w glebach lekkich do 170 mg K·kg<sup>-1</sup> w glebach bardzo ciężkich.

**Słowa kluczowe:** doświadczenia wieloletnie, potas przyswajalny, wyczerpywanie gleby z potasu

### Abstract

In the paper, the results of laboratory investigations comparing five methods (Kexchangeable, CAL, DL, Al, Mehlich) of available potassium determination are presented. The investigation has been carried on 132 soil samples originating from the treatments without, and with potassium application in the long term experiments located in nine European countries. The amounts of potassium extracted by methods in comparison increased in the direction: CAL<Kexch= DL = Mehlich <Al. The strongest correlation has been found between the pairs of methods, Kexch/ DL and Kexch/ Mehlich. Even after a long term soil mining from potassium the content of exchangeable form of this element did not fall below 50 mg K ·kg<sup>-1</sup> of light and 170 mg K ·kg<sup>-1</sup> of heavy soil.

**Key words:** long term experiments, available potassium, soil mining from potassium

## COMPARISON OF MAGNESIUM DETERMINATION METHODS AS INFLUENCED BY SOIL PROPERTIES - *Gediminas Staugaitis, Rasa Rutkauskienė*

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### Abstract

The current study was designed to investigate magnesium content in the soil. Magnesium was determined by the A-L (Egner-Riehm-Domingo), calcium chloride (Schachtschabel, 0.0125 M CaCl<sub>2</sub> 1:20), potassium chloride (1 M KCl 1:10), ammonium acetate (1 M NH<sub>4</sub>OAc 1:10), Mehlich 3 methods and water soluble magnesium (1:5). The highest magnesium content in the soil was established using the A-L method, followed by calcium chloride, potassium chloride, ammonium acetate and Mehlich 3 methods, while the lowest content was measured using water extract. The correlations between magnesium content determined by calcium chloride, potassium chloride, ammonium acetate and Mehlich 3 methods were very strong – 0.96–0.99. The correlation between magnesium contents determined by these methods and A-L was obtained only in the case when the amount of magnesium determined by the latter method was below 500 mg kg<sup>-1</sup>. The content of magnesium depended on soil texture and pH. The lowest magnesium content was measured in sand and sandy loam soils, while the highest content was recorded for clay loam. Soil pH exerted the greatest influence on the magnesium content determined by the A-L method.

**Key words:** magnesium, determination methods, soil texture, soil pH.

**PHOSPHORUS SORPTION PROPERTIES OF SELECTED POLISH ARABLE SOIL - Szara Ewa, Sosulski Tomasz, Szymańska Magdalena**

**Abstract**

The study aimed at the assessment of the soil phosphorus adsorption parameters using classical laboratory methods and equations based on Langmuire, Freundlich and Temkin modes. Soils under examination represented typical cultivated areas in Central Poland. All used sorption models are equally useful for describing the mobile phosphorus transformation in the cultivated soils. The parameters drawn from these models, such as  $S_{max}$ ,  $a_F$  and MBC may be used to assess the phosphorus sorption properties of the soils. The maximum phosphorus sorption capacity ( $S_{max}$ ) of arable layer take a relatively low values, which ranged from 62,5 to 285,7 mg P kg<sup>-1</sup> in investigated soils. The study justifies the use of the phosphorus sorption indices (PSI), determined from equilibration of the soil with a solution containing 36 mg P dm<sup>-3</sup>, at a ratio of soil/solution as 1:10, for assessment of sorption properties of the arable soils of Poland.

**Key words:** phosphorus sorption, isotherms sorption, P sorption index.

**EFFECT OF LONG-TERM FERTILISATION ON THE CONTENT AND COMPOSITION OF ORGANIC MATTER IN THE LIGHT SOIL - Cieścińska Bogumiła, Jolanta Janowiak, Ewa Szychaj Fabisiak University of Technology and Life Sciences in Bydgoszcz**

**Abstract**

The effect of long-term mineral-organic fertilisation on the content and chemical composition of soil organic matter was investigated. The total content of carbon, by oxidation method and two fractions of carbon, labile and non-labile differing in susceptibility to oxidation has been determined. The carbon management index (CMI) was calculated based on the carbon pool index (CPI) and carbon lability index (LI). The highest nitrogen dose without manure application resulted in a considerable increase in the CMI value. In the treatments with manure application increased nitrogen doses decreased the CMI value.

**Key words:** soil organic matter, long-term fertilization, oxidation capacity, carbon management index

**DAWKI NPK STOSOWANE W PRAKTYCE ROLNICZEJ POD ZBOŻA OZIME NA TLE ZALECEŃ NAWOZOWYCH - Kazimierz Kęsik, Stanisław Krasowicz, Mariusz Zarychta**

**Abstrakt**

W pracy przedstawiono wyniki badań ankietowych przeprowadzonych w latach 2001–2003 w gospodarstwach towarowych na terenie całej Polski. Uzyskano 6821 ankiet reprezentujących pola zbóż ozimych, pszenicy, jęczmienia, pszenżyta i żyta. Przedmiotem badań było porównanie dawek nawozów mineralnych stosowanych przez rolników pod zboża ozime z dawkami wynikającymi z zaleceń nawozowych systemu NawSald. Stosowane przez rolników dawki nawozów azotowych były większe o około 15 kg N, fosforowych o 18 kg P<sub>2</sub>O<sub>5</sub>·ha<sup>-1</sup> a dawki nawozów potasowych o 12 kg K<sub>2</sub>O·ha<sup>-1</sup> w porównaniu z dawkami zalecanymi przez program NawSald. Zbyt wysokie dawki azotu stosowano na 36%, fosforu na 45%, a potasu na 37% pól objętych ankietami. Zbyt niskie dawki azotu stosowano natomiast na ok. 8%, fosforu na 5%, a potasu na 16% pól produkcyjnych.

**Słowa kluczowe:** badania ankietowe, zboża ozime, stosowane dawki NPK, zalecane dawki NPK

**Abstract**

In the paper, the results of investigations carried out in the years 2001-2003 in Polish market farms by a questionnaire are presented. Questionnaires concerning 6821 fields of spring cereals, wheat, barley, oats and cereal mixture have been collected.

Fertilizer rates applied by farmers were compared with those recommended by the official fertilizer recommendation system NawSald. The applied rates of nitrogen were higher by about 15 kg N· per ha, phosphorus fertilizers by 18 kg P<sub>2</sub>O<sub>5</sub>·ha<sup>-1</sup> and potassium fertilizers by about 12 kg K<sub>2</sub>O·ha<sup>-1</sup> than the recommended ones. Too high rates of nitrogen have been applied on 36% analyzed fields and too high rates of phosphorus and potassium on 45% and 37% fields, respectively. Too low rates of nitrogen have been applied on 8%, phosphorus on 5% and potassium on 16% of fields under scrutiny.

**Key words:** farmer's poll, winter cereals, applied NPK rates, recommended NPK rates.

**PARADYGMATY METODOLOGICZNE W BADANIACH Z ZAKRESU CHEMII ROLNEJ OD UTWORZENIA NAUKI DO WSPÓŁCZESNOŚCI - *Filipek Tadeusz, Skowrońska Monika*****Abstrakt**

W pracy przedstawiono paradygmaty chemii rolnej, które wystąpiły w przeszłości i po pewnym czasie w mniejszym lub większym stopniu uległy dezaktualizacji. Stwierdzono, że osiągnięcia chemii rolnej w ostatnim 60-leciu, były w ścisłej korelacji z rozwojem społeczno-gospodarczym Polski. Dziś głównym paradygmatem badawczym i aplikacyjnym z zakresu chemii rolnej jako nauki stosowanej jest prowadzenie rolnictwa zrównoważonego i zrównoważonej gospodarki zarządzania składnikami pokarmowymi roślin, które pozwolą na utrzymanie, a nawet podnoszenie jakości oraz produktywności gleb i roślin.

**Słowa kluczowe:** chemia rolna, paradygmaty, nauka

**Abstract**

In the paper paradigms of agricultural chemistry which occurred in the past, and after some time, to a greater or lesser extent, became obsolete were presented. It was concluded that the achievements of the agricultural chemistry in the last 60 years, have been in close correlation with Polish socio-economic development. Today, the main paradigm of research and application in the field of agricultural chemistry as applied science is to conduct sustainable agriculture and sustainable nutrient management which allows maintaining and even improving the quality and productivity of soils and crops.

**Key words:** agricultural chemistry, paradigms, science