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METROLOGICAL CERTIFICATION OF INDUSTRY REFERENCE MATERIALS OF SOIL

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Metrological certification of industry certified reference materials (by agrochemical characteristics) chernozem ordinary light-clay, a chernozem typical heavy-loamy and sod-podzolic sandy-loam soil produced in Centre for Soil certified reference materials at the NSC "ISSAR named after O.N. Sokolovskiy" performed by procedure of interlaboratory experiment. It was determined that experimental data provided by participating laboratories cannot always be approximated by a normal distribution. Therefore, to establish certified values of the normalized metrological characteristics as parametric methods of calculation (if applicable) and nonparametric ones should be used.

Key words: *agrochemical characteristics, metrological certification, inter-laboratory experiment, normalized metrological characteristics, certified reference materials of soil.*

МЕТРОЛОГИЧЕСКАЯ АТТЕСТАЦИЯ ОТРАСЛЕВЫХ СТАНДАРТНЫХ ОБРАЗЦОВ ПОЧВ

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Метрологическая аттестация отраслевых стандартных образцов состава (агрохимических показателей) чернозема обыкновенного малогумусного, чернозема типичного тяжелосуглинистого и дерново-подзолистой супесчаной почвы, изготовленных в Государственном центре стандартных образцов почв при ННЦ «ИПА имени А.Н. Соколовского» выполнена по процедуре межлабораторного эксперимента. Установлено, что предоставленные лабораториями-участниками эксперимента данные не всегда можно аппроксимировать нормальным распределением, поэтому для установления аттестованных значений нормированных метрологических характеристик целесообразно использовать как параметрические методы расчета (когда это возможно), так и непараметрические.

Ключевые слова: *агрохимические показатели, метрологическая аттестация, межлабораторный эксперимент, нормированные метрологические характеристики, стандартный образец состава почв.*

References

1. Certified reference materials of composition and properties of substances and materials. Basic principles: GOST 8.315-97 GSI. – [Vved. v Ukraine s 1999-07-01]. – Minsk: Mezhdgos. sovet po standartizatsii, metrologii i sertifikatsii, 1997. – 26 s.
2. Certified reference materials of composition and properties of substances and materials. Interlaboratory metrological certification. Content and order of works DSTU GOST 8.532-2003 (GOST 8.532-2002, IDT). – [Chinnyi v Ukraini z 2003-07-01]. – K.: Derzhspozhivstandart Ukrainy, 2003. – 14 s.
3. Atanov A.N. Certified reference materials are a base of quality of analytical works / A.N. Atanov // A.N. Atanov Voprosy analiticheskogo kontrolya kachestva vod : XII Yezhegodnyi nauchno-prakticheskii seminar (Sankt-Peterburg, 18-21 sent. 2007 g.) : tezisy dokl. – Sankt-Peterburg, 2007. – S. 21-29.
4. Reference materials certification. General and statistical principles: DSTU-N ISO Guide 35:2006 (ISO Guide 35:1989, IDT). – [Chinnyi v Ukraini z 2010-10-01]. – K.: Derzhspozhivstandart Ukrainy, 2010. - 28 s.
5. General requirements for the competence of testing and calibration laboratories (ISO/IEC 17025:2005, IDT) : DSTU ISO/IEC 17025:2006. – [Chinnyi vid 2010-10-01]. – K.: Derzhspozhivstandart Ukrainy, 2007. - 32 s.
6. Metrological support of controlling the composition of materials of ferrous metallurgy : manual / pod red. Yu.L. Plinera. – M.: Metallurgiya, 1981. – 248 s.
7. Certified reference materials in state system for ensuring the uniformity of measurements. / [Semenko N.G., Paneva V.I., Lakhov V.M.]; pod red. N.G. Semenko. – M.: Izd-vo standartov, 1990. – 288 s.
8. Soils. Determination of mobile phosphorus and potassium compounds by modified Chirikov method DSTU 4115-2002. – [Chinnyi v Ukraini vid 2003-01-01]. – K.: Derzhavnyi komitet Ukrainy z pytan tekhnichnogo reguliuvannya ta spozhyvchoi polityky, 2002. - 6 s. – (Natsionalnyi standart Ukrainy).
9. Soils. Preparation of salt extract and the determination of its pH by CINAO method: GOST 26483-85. – [Vved. s 1986-07-01]. – M.: Izdatelstvo standartov, 1985. – 6 s. (Gosudarstvennyi standart Soiuz SSR).
10. Soils. Determination of hydrolytic acidity by Kappen method modified by CINAO: GOST 26212-91. – [Vved. s 1993-07-01]. – M.: Izdatelstvo standartov, 1992. – 7 s. (Gosudarstvennyi standart Soiuz SSR).
11. Soil quality. Method for organic matter determination: DSTU 4289:2004 – [Chinnyi vid 2005-07-01]. – K.: Derzhspozhivstandart Ukrainy, 2005. – 9 s. – (Natsionalnyi standart Ukrainy).

12. Soil quality. Method for determination of available (labile) organic matter: DSTU 4732:2007. – [Chinnyi vid 2008-01-01]. – K.: Derzhspozhivstandart Ukrainy, 2008. – 9 s. – (Natsionalnyi standart Ukrainy).
13. Soil quality. Method for determination of nitrate and ammonium nitrogen modified by NSC ISSAR: DSTU 4729:2007. – [Chinnyi vid 2008-01-01]. – K.: Derzhspozhivstandart Ukrainy, 2008. – 9 s. – (Natsionalnyi standart Ukrainy).
14. Procedure of measurements 31-497057-007-2005 Soils. The method of determining the exchangeable calcium, magnesium, sodium and potassium in the soil to the procedure of Shollenberger modified by NSC ISSAR // Metodyky vyznachennia skladu ta vlastyvostei gruntiv : zbirnyk. – Kharkiv, 2005. – Knyga 2. – S. 35-48.
15. Soils. Determination of exchangeable calcium and exchangeable (mobile) magnesium by CINAO method: GOST 26487-85. – [Vved. s 1986-07-01]. – M.: Izdatelstvo standartov, 1985. – 14 s. (Gosudarstvennyi standart Soiuzu SSR).
16. Prokhorova I.A. Results of interlaboratory experiment for metrological certification of soil composition reference materials - in print.
17. Grigoriev V.A. Statistical approaches and algorithms of reference materials metrological certification / V.A.Grigoriev, L.A.Berkovits, A.G.Fadeev // Reference materials in practice of state and departmental metrological services : Vses. nauchn.-tekhnich. konf., (Sverdlovsk, 21-23 okt. 1986) : tez. dokl. – Sverdlovsk, 1986. – S. 52-54.
18. Accuracy (trueness and precision) of measurement methods and results. Part 2. Basic method for the determination of repeatability and reproducibility of a standard measurement method: DSTU GOST ISO 5725-2:2005 (GOST ISO 5725-2-2003, IDT). – [Chinnyi v Ukraini z 2006-07-01]. – K.: Derzhspozhivstandart Ukrainy, 2006. – 59 s.
19. Industry reference materials. Reference materials of soil for agrochemical and research laboratories. General provisions: SOU 73.1-37-221:2005. – [Chinnyi vid 2005-07-01]. – K.: Minagropolityky Ukrainy, 2005. – 24 s. – (Standart Minagropolityky Ukrainy).