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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

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**Specifications for color and legend of soil nutrient maps at the
scale of 1: 25 000 - 1: 500 000**

1 : 25 000~1 : 500 000 土壤养分图用色与图例规范

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1 Scope

The document fixes the setting and arrangement of the colour targets of fifteen indicators of soil nutrient maps at scales from 1:25 000 to 1:500 000, and the requirements for the legend and the annotation.

It applies to the compilation and publication of soil nutrient maps of those indicators at scales from 1:25 000 to 1:500 000, on the national basic scale sheet divisions or on other sheet divisions, paper maps and electronic maps alike.

The document notes that the fifteen indicators are soil organic matter, total nitrogen, total phosphorus, total potassium, available phosphorus, readily available potassium, exchangeable calcium, exchangeable magnesium, total sulfur, available iron, available manganese, available copper, available zinc, available boron and available molybdenum.

2 Normative references

The document has no normative references.

3 Terms and definitions

3.1 color series: a group of tones whose colour keynote is close to one another. The document notes that the colour series is the management unit one level above the tone. Source: GB/T 36501-2018, 3.5, modified.

3.2 tone: the colour gradation formed by the overall relation between one colour and another. Source: GB/T 16820-2009, 6.12.

3.3 color target: the series of colour values used to establish the relation between the colour presented by the equipment and its input values. Source: GB/T 9851.2-2008, 2.25.

3.4 color value: the set of data that expresses a colour in a particular colour space. Source: GB/T 9851.2-2008, 2.26.

3.5 soil nutrient map: the map that shows the distribution of the content, or of the content grade, of the various nutrient elements of the soil.

4 Setting, arrangement and use of the colours

4.1 Setting requirements. The setting of the tones and of the colour targets shall meet the following requirements: a) one tone is set for one soil nutrient indicator, at most two, and the colour transition shall be natural; b) the colour chosen for a soil nutrient indicator may be the colour of the end point of the chemical test solution titration, or of the titration process, or the colour of the flame in which the element burns; c) for a soil nutrient indicator whose colour is not chosen by the method of b), a tone that differs considerably in colour is selected; d) the colour difference between the colour targets within a tone shall be obvious and distinguishable by the naked eye.

4.2 Arrangement of the colour targets. Seven colour targets are set for each nutrient, standing for seven colour grades. The saturation and the brightness of the colour targets change in turn, so that the colour runs from light to dark. The colour targets are ordered from light to dark.

4.3 Naming principles. Following GB/T 36501, the document sets seven colour series, namely red, brown, umber, yellow, green, cyan (blue) and purple. Tones are named mainly by adding the name of the main colour series to that of the transition colour series, and some tones are named by custom. Colour targets are named by adding a sequence number to the name of the tone, following the order from light to dark within the tone.

4.4.1 When a graded soil nutrient map is compiled, the choice of the tone and of the colour targets of the fifteen soil nutrient indicators shall follow the provisions of Annex A.

4.4.2 When a graded soil nutrient map is compiled, the grading is set first; the corresponding colour targets are then chosen from light to dark, following the nutrient content range from low to high, from Annex A. Where the number of grades is fewer than seven, colour targets may be selected at intervals from the middle of the range; where it is more than seven, image processing software may be used to add colour targets outside the colour targets at the two ends of the range, on the basis of the colour values of the several colour modes listed in Annex A, or the colour targets at the two ends may be kept and the intervals between the colour targets redefined.

4.4.3 When a soil nutrient raster map with a colour gradient is compiled, any one colour target of the tone of that nutrient may be selected, and the mapping software then adjusts

the depth of the colour automatically to draw the map.

5 Legend and annotation

5.1 Legend. The colour and the pattern of the mapping unit of a soil nutrient map shall meet the following requirements. a) The legend of a graded soil nutrient map is made up of five parts: the unit of measurement, the grading code, the colour patch, the nutrient content range of the grade and the test method. The grading code may use Arabic numerals, Roman numerals or Chinese numerals, arranged from small to large, standing for a grading range from low to high, with the corresponding colour patches running from light to dark; the unit of measurement used is the national legal unit of measurement. b) The legend of a soil nutrient raster map with a colour gradient is made up of four parts: the unit of measurement, the upper and lower limits of the nutrient content, the gradient colour band and the test method. c) The colour patches of the legend have an outline, a solid line, of a thickness less than 0.2 mm, grey, the optical three-primary colour values RGB being 225, 225 and 225 respectively, the four-colour printing colour values CMYK being 10, 8, 8 and 0 respectively, and the three-attribute colour values HSB being 0, 0 and 88 respectively. d) In the legend of a graded map, the ratio of the width to the length of the rectangular colour patch is 0.5, and the grading code is in the Song typeface, black.

5.2.1 The grading code of the soil nutrient on a soil nutrient map is annotated in the Song typeface, black, the character size depending on the scale of the map, on the condition that it is in keeping with the other annotation on the map and does not affect legibility.

5.2.2 Sample examples of maps of the content of some soil nutrients are given for reference in Annex B.

6 Verification method

When the relevant body compiles and reviews a soil nutrient map, it verifies the make-up of the legend, namely the tone, the colour target, the unit of measurement of the legend and the test method of each soil indicator, by visual comparison.

A Annex A (normative) Colour targets of soil nutrient maps

The colour targets of soil nutrient maps shall follow the provisions of Table A.1.

Table A.1 gives, for each soil nutrient indicator, the tone assigned to it, the names of its seven colour targets, a printed colour patch for each of them, and three sets of colour values for each colour target: the optical three-primary RGB values (red, green, blue), the four-colour printing CMYK values (cyan, magenta, yellow, black) and the three-attribute HSB values. The numeric colour values are not reproduced here.

On the pages available, the table pairs the indicators with the tones as follows: soil organic

matter with yellow-green; total nitrogen with pink; total phosphorus with deep blue; total potassium with yellow-brown; available phosphorus with light blue; readily available potassium with golden yellow; available iron with orange-brown; available manganese with red-purple; available copper with blue-green; available zinc with brown; available boron with umber; available molybdenum with bright blue; exchangeable calcium with grey-umber; and exchangeable magnesium with rose-purple. The colour targets of each indicator are numbered from one to seven within its tone.

The row for total sulfur, the fifteenth indicator named in Clause 1, falls beyond the pages available and is therefore not reported here.