

COMPARISON OF SOIL TEXTURE CLASSIFICATION ACCORDING TO THE NEW POLISH STANDARD, PTG AND INTERNATIONAL CLASSIFICATIONS (FAO AND USDA)

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A b s t r a c t. The classification into soil fractions found in the new Polish Standard PN-R-04033 is fully comparable with the international classifications (FAO/USDA) in question. The following diameters were adopted as the main groups of soil fractions: stones >75 mm, gravel 75-2 mm, sand 2.0-0.05 mm, silt 0.05-0.002 mm and clay <0.002 mm. On the other hand, soil fractions classification according to the Polish Soil Science Society (PTG), including so-called fine particles (<0.02 mm), is not compatible with both the new Polish Standard and the discussed international classifications. This also refers to the classification into textural groups according to PTG. However, the classification into textural groups according to Polish Standard is quite similar to international classifications.

K e y w o r d s: soil fraction, textural group, classification.

INTRODUCTION

In 1997 Polish Normalisation Committee (PKN) changed of the old branch standard BN-78/9180-11 "Classification into textural groups and fractions" and replaced it by a new one - PN-R-04033 [2]. However, since there is another soil texture classification developed by the Polish Soil Science Society (PTG) in common use in Poland [3] forming an integral part of the Polish Soils Systematics, it is essential to recognise "similarities and differences" of these two Polish classifications and compare them with the most common international classifications (FAO and USDA).

SOIL FRACTION CLASSIFICATIONS

The soil fraction classification according different systems are given in Table 1.

Table 1. The diameter of soil fraction according to two Polish classifications (PTG and PN-R-04033) and FAO/USDA

Soil fractions	PTG	PN-R-04033	FAO/USDA
	Diameter in mm		
Stones	>20	>75	>75
- coarse	-	>500	-
- medium	-	250-500	-
- fine	-	250-75	-
Gravel	20-1	75-2	75-2
- coarse	-	75-20	-
- medium	-	20-5	-
- fine	-	5-2	-
Sand	1-0.1	2-0.05	2-0.05
- very coarse	-	2-1	2-1
- coarse	1-0.5	1-0.5	1-0.5
- medium	0.5-0.25	0.5-0.25	0.5-0.25
- fine	0.25-0.1	0.25-0.10	0.25-0.10
- very fine	-	0.10-0.05	0.10-0.0
Silt	0.1-0.02	0.05-0.02	0.05-0.002
Clay	<0.02*	<0.002	<0.002

*so-called fine fraction which comprises three subfractions: coarse silt-clay 0.02-0.05, fine silt-clay 0.005-0.002 and colloidal clay <0.002 mm.

The classification into soil fractions found in the new Polish Standard [2] speaking fully coincides with international classifications - FAO/USDA [1,4].

On the other hand, soil fraction classification according to PTG is not compatible with both the new Polish Standard and FAO/USDA classifications.

SOIL TEXTURE GROUP CLASSIFICATIONS

The classifications into soil textural groups according new Polish Standard and FAO/USDA classification (in triangle form) are shown in Figs 1 and 2. The classification of soil texture group according to PTG is "uncomparable" due to incompatibility of classification of soil fraction with new Polish Standard and FAO/USDA classification. In Table 2 are given all names of main soil textural group and their symbols according Polish and FAO/USDA classifications.

The Polish standard distinguishes 16 main texture groups: 3 sands, 6 loams, 3 silts and 4 clays, whereas FAO/USDA standards distinguish 12 such groups: 2 sands, 6 loams, 1 silt and 3 clays. It is quite apparent that the Polish Standard

Table 2. The names and symbols of main soil textural group according to Polish Standard PN-R-04033 and FAO/USDA

Soil textural groups			
PN-R-04033		FAO/USDA	
Name	Symbol	Name	Symbol
sand	p	sand	S
slightly loamy sand	ps	loamy sand	LS
loamy sand	pg		
sandy loam	gp	sandy loam	SL
light loam	gl	sandy clay loam	SCL
loam	g	loam	L
medium loam	gs	silty loam	SiL
heavy loam	gc	clay loam	CL
silty loam	gpl	silty clay loam	SiCL
sandy silt	płp	silt	Si
silt	pł		
clayey silt	płi		
sandy clay	ip	sandy clay	SC
silty clay	ipł	silty clay	SiC
clay	i	clay	C
heavy clay	ic		

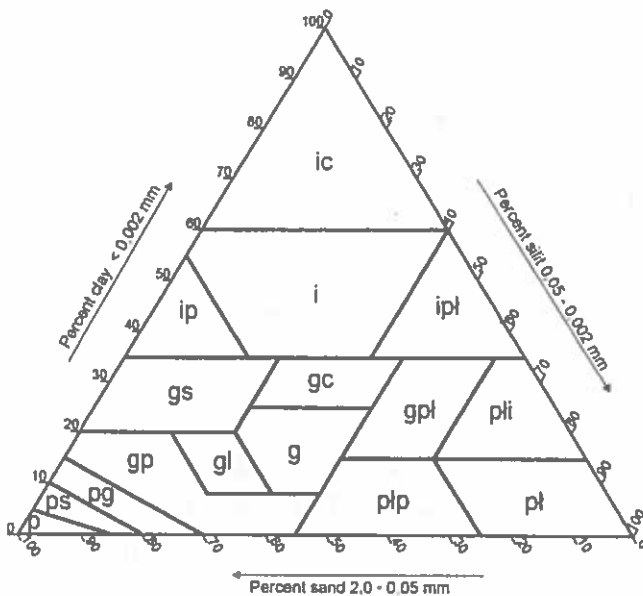


Fig. 1. Textural groups acc. to Polish standard PN-R-04033 (explanation of symbols - in Table 2).

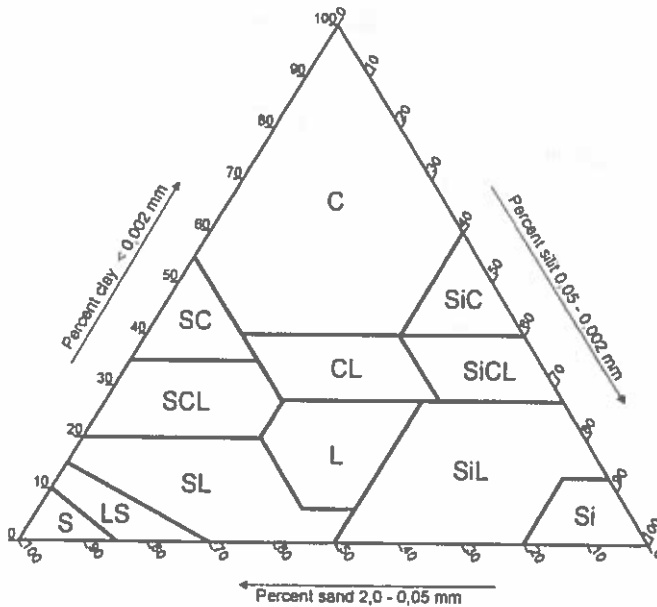


Fig. 2. Textural groups according to FAO/USDA (explanation of symbols - in Table 2).

classification is more particular, especially with regard to silts.

The comparison of the graphic form of this classification (as triangle) shows in many cases considerable similarities of the distinguished groups (areas on the triangle) as well as regions where those classifications differ greatly.

It should be emphasised that the application of the above mentioned triangles can be very helpful in performing various comparisons and interpretations of obtained results, i.e. carry out transfers from the Polish system to the international one and vice-versa.

CONCLUSIONS

1. The classifications of soil fraction and textural groups according the new Polish Standard (PN-R-04033) is fully compatible with FAO/USDA classification in respect to soil fraction and quite similar in textural group classifications.

2. The Polish Soil Science Society (PTG) shall approved and recommend for scientific purposes this new standard because classification of soil fraction and textural group according to PTG - system is absolutely uncomparable to FAO/USDA classifications.

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