

# SOILS FOR FUTURE UNDER GLOBAL CHALLENGES

SERBIAN SOCIETY OF SOIL SCIENCE  
University of Belgrade, Faculty of Agriculture  
Sokobanja, 21-24 September 2021  
III International and XV National Congress  
<https://congress.sdpz.rs/>

## CORRELATION BETWEEN RANKER SOIL TYPE OF NATIONAL CLASSIFICATION SYSTEM AND LEPTOSOLS REFERENCE SOIL GROUP OF WORLD REFERENCE BASE FOR SOIL RESOURCES – THEORETICAL APPROACH

Ljubomir Životić\*, Aleksandar Đorđević, Day Boitumelo Mohlala, Jelena Bogosavljević, Lazar Kaluđerović

University of Belgrade, Faculty of Agriculture, Nemanjina 6, 11080 Belgrade, Serbia

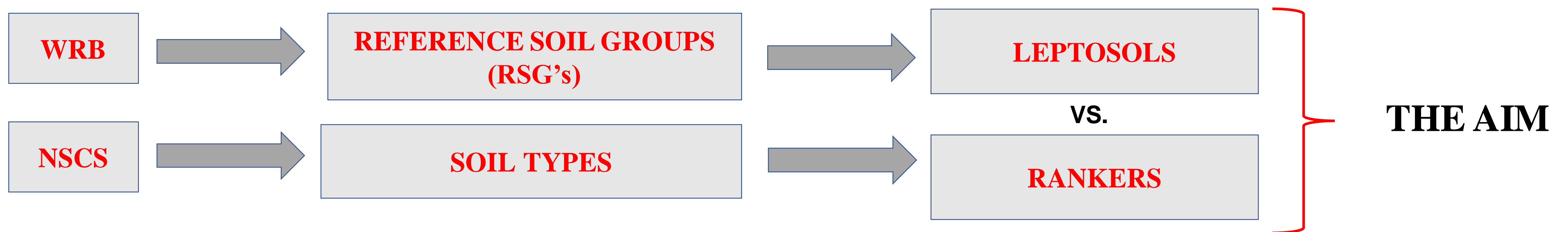
\*Corresponding author: ljubaz@agrif.bg.ac.rs

### RATIONALE

#### SOIL CLASSIFICATION - SYSTEMATIC CATEGORIZATION OF SOILS – SOIL ASSESSMENT – ECOLOGICAL VALUE

1. World Reference Base for Soil Resources (WRB): **diagnostic horizons**, diagnostic properties, diagnostic materials

2. National Soil Classification System (NSCS) utilize **genetic horizons**: the principles of genetic classification.



### LEPTOSOLS

The major connotation of Leptosols is thin soils (Leptos gr. – thin).

Leptosols are distributed at over 1655 million ha Worldwide

1. Leptosols should have one of the following:

- continuous rock or technic hard material starting  $\leq 25$  cm from the soil surface; or
  - $< 20\%$  (by volume) fine earth, averaged over a depth of 75 cm from the soil surface or to continuous rock or technic hard material, whichever is shallower; and
2. Leptosols should not have calcic, chernic, duric, gypsic, petrocalcic, petroduric, petrogypsic, petroplinthic or spodic horizon.

### RANKERS

Soil horizon sequence: A – R, A – C or A – C – R.

They have well developed humus–accumulative horizon and are formed on non-calcareous parent materials.

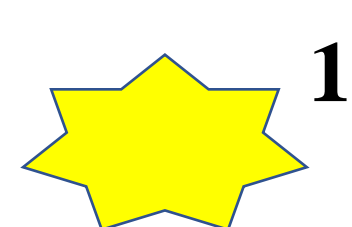
The word rank means slope since this soil is formed on steep slopes.

Humus–siliceous soils: rich in humus and are formed on siliceous parent materials.

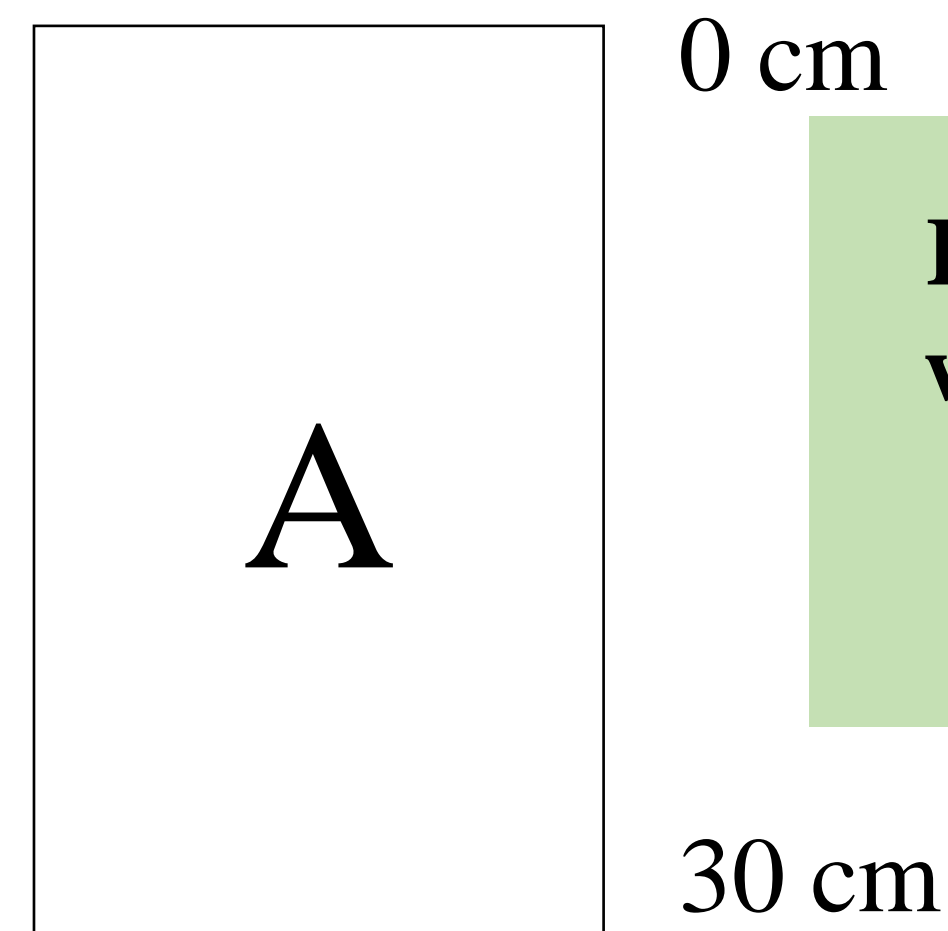
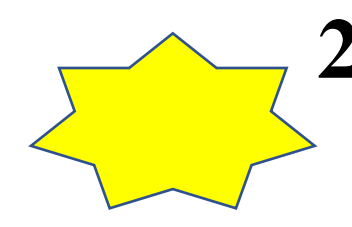
They cover from 5.2-16.4% of the Serbian territory.

Soil thickness varies from few centimetres to 40–50 cm or even more.

They are often rich in gravel and have a low amount of clay.

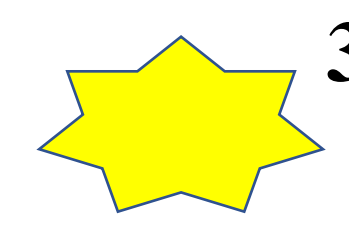


**Rendzic Leptosol is not Ranker**



**Rankers thicker than 25 cm without  $> 80\%$  vol. of gravel over entire depth are not Leptosols**

### PERSPECTIVES



**Both Ranker on andezite and Leptosol ( $< 25$  cm thick)**

#### Leptosols vs. Rankers and RSG's with Leptic qualifier which can be Rankers

Reference Soil Group	Principal qualifier	Soil type - National soil classification system (NSCS)
Leptosols	Nudilithic/ Lithic	Lithosols / Rankers
	Technoleptic	Technosols
	Hyperskeletal/ Skeletic	Lithosols, Rankers, Regosols / Technosols
	Subaquatic/ Tidalic	Subquauous Soils/Eugleys, Humogleys
	Folic/ Histic	Peat Soils
	Rendzic/ Mollic/ Umbric	Rendzinas, Calcomelanosols/Rankers
	Cambic/ Brunic	Rankers, Eutric Cambisols, Dystric Cambisol/Rankers
	Gypsic	Not exist
	Dolomitic / Calcaric	Rendzinas
	Dystric/ Eutric	Rankers
Andosols**	Leptic*	Rankers
Phaeozems**	Leptic*	Rankers
Umbrisols**	Leptic*	Rankers
Cambisols**	Leptic*	Rankers
Regosols**	Leptic*	Rankers



This work is the result of investigations under the contract between University of Belgrade, Faculty of Agriculture, and Ministry of Education, Science and Technological Development of the Republic of Serbia (grant no. 451-03-9/2021-14/200116)

\*Leptic means that continuous rock or technic hard material starts  $\leq 100$  cm from the soil surface

\*\* These RSG's can belong also to other soil types than Rankers; Here, the comparison was only into one way direction.