WRB, 4th edition, 18 December 2022; errata sheet, 24 September 2024

Page	Change	Reason
13	Paragraph 4: Replace 'second edition' by 'third edition'	Obvious
21	Table, 2nd group: Replace 'With' by 'Strongly altered by'	Better reflecting the criteria of the related diagnostic horizons
21	Table, 5th group: Phaeozems, Umbrisols: Replace 'base status' by 'base saturation'	More correct and differentiatng from 7th group
26	Subqualifiers contructed by the users, first paragraph: After 'whichever is shallower' add ', or if the non-reported depth range does not influence the correctness of the subqualifier. (Example: A soil is described until 90 cm from the mineral soil surface. It has 0% coarse fragments from 0 - 50 cm and 60% from 50 - 90 cm from the mineral soil surface. The Skeletic qualifier does not apply, but one can use the Endoskeletic subqualifier, because Endoskeletic applies regardless of the amount of coarse fragments from 90 - 100 cm.)'	Better use of the subqualifiers and reflecting what people already do
27	After the first Epi-: Replace 'not used if a limiting layer starts ≤ 50 cm from the (mineral) soil surface' by 'if a limiting layer starts ≤ 50 cm from the mineral soil surface, the qualifier referring to the limiting layer receives the Epi- specifier and all other qualifiers remain without specifier.'	Consistent with group 2
27	After the first Amphi-: Replace 'two or more times,' by 'two or more times:'	The colon avoids misunderstandings
35	Last line: Replace 'the overlying horizon' by 'in the overlying horizon(s)'	Harmonized with the natric horizon
37, 38, 47, 78, 79	Calcic horizon, gypsic horizon, protocalcic properties, protogypsic properties: Diagnostic criteria: Replace 'accumulations' by 'concentrations'	Consistent with the Field Guide (Chapter 8.4.15) and with the diagnostic criteria of other diagnostic horizons
38, 47	Calcic horizon, gypsic horizon: Diagnostic criterion 2.b.: Replace 'that of an underlying layer' by 'that of the underlying layer'	Avoids that somebody compares layers with a large distance in between
40	Cambic horizon: Diagnostic criterion 4: Replace '*spodic, umbric, terric, tsitelic* or *vertic* horizon' by '*spodic, terric, tsitelic, umbric* or *vertic horizon* '	Alphabet
45	Ferric horizon: Diagnostic criterion 1. a and b: Replace 'occupied by' by 'occupied by oximorphic features in form of'	If we do not mention that, the masses, concretions and nodules could be of any substance. Make ferric, plinthic, pisoplinthic and petroplinthic horizons consistent with each other and the Field Guide.
51	Limonic horizon: Diagnostic criterion 1: Replace 'oximorphic features that are a. black' by 'oximorphic features that a. are black'	Obvious
54	Natric horizon: Diagnostic criterion 3.a: Replace 'in some part of the horizon' by 'in some parts of the horizon'	Obvious
55	Nitic horizon: Replace 'pressure faces' by 'stress features'	Consistent with the Field Guide (Chapter 8.4.14); the nitic horizon requires shiny surfaces and (as written in the Relationships) may grade into a vertic horizon
56	Petrocalcic horizon: Diagnostic criterion 1: Replace 'has very strong effervescence after adding a 1 M HCl solution' by ' is strongly or extremely calcareous as shown by effervescence with 1 M HCl solution'	Adjusted to the Field Guide (Chapter 8.4.25)

59	Petroplinthic horizon: Diagnostic criterion 1: Replace 'consists of oximorphic features inside (former) soil aggregates that are at least partially interconnected and have a reddish, yellowish and/or blackish colour' by 'consists of oximorphic features in form of reddish, yellowish and/or blackish concretions and/or nodules inside (former) soil aggregates that are at least partially interconnected'	We must mention what is interconnected. Make ferric, plinthic, pisoplinthic and petroplinthic horizons consistent with each other and the Field Guide.
60	Pisoplinthic horizon: Diagnostic criterion 1.a: Replace 'yellowish, reddish and/or blackisch' by 'oximorphic features in form of yellowish, reddish and/or blackish'	We must mention that it is oximorphic. Make ferric, plinthic, pisoplinthic and petroplinthic horizons consistent with each other and the Field Guide.
66	Spodic horizon: General description, line 6: Replace 'surface area' by 'specific surface'	Obvious
66	Spodic horizon: Diagnostic criteria 3 and 4: Replace '90%' by '85%'	Back to the third edition
66	Spodic horizon: Diagnostic criterion 4: Replace 'has one or more subhorizons with the following Munsell colours' by 'has in every subhorizon one of the following Munsell colours'	We need colour criteria for the whole spodic horizon. The error was a side effect of the successful adjustment of the spodic criteria to embark the Iron Podzols
68	Thionic horizon: Diagnostic criterion 2.b: Replace '*sulfidic material* ' by '*hypersulfidic material* '.	The sulfidic material was abolished in the 4th edition
75	Continuous rock: Replace '(by volume)' by '(by volume, related to the whole soil)'	Obvious
75	Gleyic properties: General description, line 2: Replace 'a period that allows' by 'a period long enough to allow'	Make consistent with stagnic properties
78	Protocalcic properties: Diagnostic criteria, first line: After 'secondary carbonates, visible when moist' add 'show one or more of the following:'	Obvious
81	Stagnic properties: General description, line 2: Replace 'that allows' by 'to allow'	Better English
82	Stagnic properties: Diagnostic criterion 4: Replace 'kg dm^{-1}' by 'kg dm^{-3}'	Obvious
92	Solimovic material: General description, line 4: Delete 'or soil creep'	Contradiction to diagnostic criterion 2
101	Vertisols: Supplementary qualifiers: Switch 'Hypereutric' and 'Epic/ Endic'	Alphabet
114	Umbrisols: Supplementary qualifiers: Replace 'Hyperdystric' by ' Dystric'	Relict from the times, when Dystric was defined at pH 7
128	Aluandic: Delete '(in Andosols only)'	Allow adding to other RSGs as last supplementary qualifier
128	Archaic, line 3: Replace 'artefacts produced by pre-industrial processes' by 'of which were produced by pre-industrial processes'	Avoid misunderstandings
131	Dystric: Add as second bullet point '•in other soils, having a limiting layer starting ≤ 25 cm from the mineral soil surface, exchangeable Al > exchangeable (Ca+Mg+K+Na) in half or more of the lowermost 5 cm consisting of *mineral material* above the limiting layer,'	As in the third edition
132-133	Eutric: Add as second bullet point '•in other soils, having a limiting layer starting ≤ 25 cm from the mineral soil surface exchangeable (Ca+Mg+K+Na) ≥ exchangeable Al in the major part of the lowermost 5 cm consisting of *mineral material* above the limiting layer,'	As in the third edition
133	Oligoeutric: Add as first bullet point '•in soils, having a limiting layer starting ≤ 25 cm from the mineral soil surface, exchangeable (Ca+Mg+K+Na) ≥ exchangeable Al and exchangeable (Ca+Mg+K+Na) < 5 $cmol_c$ kg^{-1} clay in the major part of the lowermost 5 cm consisting of *mineral material* above the limiting layer,' and start the following bullet point with 'in other soils'	As in the third edition
134	Skeletofolic: Replace 'having a *folic horizon* ' by 'having a *folic horizon* starting at the soil surface'	Obvious

135	Garbic: Replace '*artefacts* , ≥ 35% (by volume, related to the whole soil) of which contain' by '*artefacts* , ≥ 35% of which contain'	The repetition of the relation caused misunderstandings
135	Inclinigleyic: Replace 'from the mineral soil,' by 'from the mineral soil surface,'	Obvious
137	Humic: Replace 'the depth range below that contributes a 0 to the calculation of the weighted average' by 'the weighted sum of the *soil organic carbon* is nevertheless divided by 50 cm	Avoid misunderstandings
141-142	Hypernatric: Replace 'throughout the entire *natric horizon* or within its upper 40 cm' by 'throughout the entire *natric horizon* or its upper 40 cm'	Throughout refers to both (see natric horizon, diagnostic criterion 4.b.i)
143	Ortsteinic: Replace 'moderately cemented' by 'weakly cemented'	Consistent with spodic horizon, diagnostic criterion 5.c
144	Posic: Replace 'having layer' by 'having a layer'	Obvious
144	Profondic: Replace 'within 150 cm' by 'down to 150 cm'	Avoid misunderstandings
145	Reductaquic: Replace 'at some time of the year' by 'for some time during the year'	Avoid misunderstandings
146	Silandic: Delete '(in Andosols only)'	Allow adding to other RSGs as last supplementary qualifier
147	Protospodic: Replace 'has an Al_{ox} value that is ≥ 1.5 times' by 'has a pH_{water} of < 4.6 and has an Al_{ox} value of ≥ 0.5% that is ≥ 1.5 times '	1. Requirement of an Al_{ox} value ≥ 0.5% as in the third edition. 2.Introduce a requirement for a pH value that allows mobile Al species (see Chapter 9.13). In the third edition, there was a requirement for a minimum C_{org} content. This was not appropriate becaues podzolization mostly does not start with C_{org} translocation. However, deleting this criterion without adding a new one, created many cases with a nonsensical Protospodic qualifier. This should be avoided now with the pH criterion.
147	Spolic: Replace '*artefacts* , ≥ 35% (by volume, weighted average, related to the whole soil) of which consist ' by '*artefacts* , ≥ 35% of which consist'	The repetition of the relation caused misunderstandings
148	Inclinistagnic, line 8: Replace 'a slope inclination' by 'and having a slope inclination'	Syntactically required
150	Urbic: Replace '*artefacts* , ≥ 35% (by volume, weighted average, related to the whole soil) of which consist ' by '*artefacts* , ≥ 35% of which consist'	The repetition of the relation caused misunderstandings
162	Landform and topography: Replace 'one upslope and one downslope;' by 'one upslope and one downslope, if possible, 10 m distance each;'	Had been forgotten
168	Litter layer: Replace 'Report the average' by 'Report the percentage of the area covered and report the average'	Had been forgotten
175	Water saturation: Table 8.27: Add a new line as third to last: Criterion: 'Formerly water-saturated for ≥ 30 consecutive days, then drained and now water-saturated for < 30 consecutive days'. Code DR	Had been forgotten
183	Soil texture: Figure 8:14, square bottom left: Replace 'Does soil take a polish and/or feel smooth?' by 'Does soil exhibit a polished surface and/or a surface smooth like glass?'	Avoid misunderstandings (individual shiny micas had been mistaken as shiny surface)
184	Soil structure, first line: Replace 'soil' by 'solid'	Obvious
184	Soil structure, third paragraph: Replace 'Aggregates of the types' by 'A massive layer or aggregates of the types'	Had been forgotten

185	Soil structure, first paragraph: Replace 'For each type, report separately grade, penetrability for roots, and size class.' by 'For aggregates and artificial structural elements, report grade, penetrability for roots, and size class, for each type separately.'	Had been forgotten
192	Concentrations: Table 8.51: Add a new line as last line: Description: 'Covering the surfaces of coarse fragments, remnants of a broken-up cemented layers, aggregates or pore walls'. Designation: Coating	Had been forgotten
194	Redoximorphic features, first paragraph: Replace 'Redoximorphic features (oximorphic features plus reductimorphic features) are the result of redox processes. Oximorphic features show the accumulation of substances in oxidized state and usually ' by 'Redoximorphic features (reductimorphic features plus oximorphic features) are the result of reduction processes or of reduction and subsequent re-oxidation processes. Oximorphic features show the accumulation of substances in oxidized state (concentrations) and usually '	Better explanation of the soil forming process
200	Ribbon-like accumulations: Add after lamellae: 'For lamellae, report additionally the texture class, the abundance of clay coatings and clay bridges and the combined thickness within 50 cm of the upper limit of the uppermost lamella. Report the abundance of •Clay coatings in % of the surfaces of soil aggregates, coarse fragments and/or biopore walls •Clay bridges between sand grains in % of involved sand grains.	Had been forgotten
201	Secondary carbonates: Table 8.64, first line: Replace 'Masses (including spheroidal aggregations like white eyes (byeloglaska))' by 'Masses (including spheroidal aggregations like white eyes (byeloglaska); including masses filling the complete fine earth)'	Avoid misunderstandings
201	Secondary carbonates: Table 8.64, last line: Replace 'Coatings on undersides of coarse fragments and of remnants of broken-up cemented layers' by 'Coatings on undersides of coarse fragments and of remnants of broken-up cemented layers (with or without coatings on other sides)'	Avoid misunderstandings
202-203	Readily soluble salts: Replace 'EC_{SE}' by 'EC_e' and replace 'WC_{SE}' by 'WC_e'	Consistent with the salic horizon and with GLOSOLAN
204	Consistence, second paragraph: Replace 'For checking cementation, different specimens' by 'Cementation by ice is obvious. For checking cementation by other agents, different specimens'	Obvious
207	Andic characteristics: Replace 'pH_{NaF} of > 9.5' by 'pH_{NaF} of ≥ 9.5'	Consistent with andic properties, field identification
209	Soil organic carbon, first paragraph: Replace 'Report the estimated organic carbon content.' by 'Report the minimum and maximum value of the estimated organic carbon content.'	Had been forgotten
210	Soil organic carbon, last paragraph: Replace 'Report up to three types, the dominant one first, and report the percentage (by exposed area) for each type separately. Black carbon has to be additionally reported as percentage of the exposed area (related to the fine earth plus black carbon of any size).' by 'Report up to three types, the dominant one first, and report the percentage (by exposed area) for each type separately. **Black carbon (o, m)** Black carbon has to be additionally reported as percentage of the exposed area (related to the fine earth plus black carbon of any size).'	Black carbon has to be reported in both organic and mineral soil

209-210	Soil organic carbon: Delete '(m)' from the headline and change the subheaders as follows: Estimation of the content (m) (*) Natural accumulations of organic matter (m) Black carbon (o,m)	Black carbon has to be reported in both organic and mineral soil
213	Degree of decomposition..., first paragraph: replace 'visible plant tissues' by 'recognizable dead plant tissues'	Consistent with Chapters 2.1 and 10.2
214	Dead natural plant residues, first paragraph: Replace 'treated' by 'processed'	Avoid misunderstandings
214	Dead natural plant residues, Table 8.93: Delete the line 'Other plants' and Replace the last line 'No dead plant residues' by 'No dead residues of wood or of moss fibres'	Only moss fibres and wood are referred to in diagnostic criteria
225	Master symbols, A: Replace 'cultivation' by 'agricultural practices'	Avoid misunderstandings
225	Master symbols, R: Replace '24 hours' by '1 hour'	Consistent with the diagnostic property Continuous rock
226	Suffixes, c: Replace 'following another suffix (k, q, v, y)' by 'following another suffix (g, k, q, v, y)'	Had been forgotten
227	Suffixes, k: Replace 'than that of an underlying layer' by 'than that of the underlying layer'	As in the calcic horizon
227	Suffixes, t: Replace 'clay minerals' by 'clay minerals (with or without associated oxides)'	Avoid misunderstandings
228	Suffixes, α: Add 'and no prominent accumulation of secondary carbonates'	α is meaningless in horizons with the suffix k
235	Colour symbols, third paragraph, line 4-5: Replace 'optional qualifiers' by 'elective qualifiers'	See Chapter 2.5