**Spring School 2018: Classification CN036, ES020, CR002, CR003 and ID048** (Stephan)

**Mozambique 7: MZ-007**

Natric horizon (105-135 cm)

Albic material (by criterion 2d)

Argic horizon (58-105 cm)

Abrupt textural difference (condition 2a) at 58 cm

Reducing conditions > 135 cm

Ochric

Stagnic properties? Check

RSG WRB2015: Planosol

Full WRB 2015 classification:

Epidystric, Katoeutric, Luvic, Albic, Reductic Planosol (Anoarenic, Endoloamic, Capillaric, Ochric, Magnesic, Sodic)

**Mozambique 3: MZ-003**

Argic horizon (25-185 cm)

Nitic horizon (25-70 cm). > 30% clay and silt to clay ratio < 0.4

Color hue: 2.5 YR throughout

Low CEC (< 18 cmol.kg-1 clay in the argic horizon)

Ferralic properties (30 cm – 160 cm)

RSG WRB2015: Nitisol

Full WRB 2015 classification:

Dytric, Acric, Rhodic, Ferralic Nitisol (Ochric, Vetic)

Group exercise: Rhodic Lixic Ferralsol

**China 36 – CN036:**

Argic horizon (17-105 cm). Not so much because of the increase in clay content (is excluded as the EB starts directly under a plough layer), condition 2a is not met, but because of condition 2biii: clay coatings covering more than 5% of the ped faces.

No mollic horizon (does not meet the color criterion of chroma ≤ 3 when moist)

No Ferric horizon (Munsell color chroma does not match criteria; it is ≤ 5)

Chromic (105 – 140 cm)

Profondic (clay content does not decrease with 20% or more from its maximum within 150 cm)

Group exercise: Protovertic horizon?

RSG WRB2015: Luvisol

Full WRB 2015 classification:

Chromic Luvisol (Pantoloamic, Endoclayic, Cutanic, Hypereutric, Ochric, Profondic)

**Spain 20 – ES020:**

No mollic horizon (color value > 3 and CaCO3 < 40% in top horizon)

Cambic B horizon (24-39 cm)

Petrocalcic horizon (39-75 cm)

Broken petrocalcic horizon (deep ploughing), fragments not considered enough to be calcifractic

RSG WRB2015: Calcisol

Full WRB 2015 classification:

Cambic Petric Calcisol (Epiloamic, Aric, Hypercalcic, Ochric)

Group exercise: No cambic because of ploughing and CaCO3 (criterion 3c,i and criterion 4 of the Cambic horizon)

**Costa Rica 3 – CR003:**

No organic material (because < 20% SOC), therefore no Histic horizon

Mollic horizon: 0 – 40 cm (with SOC > 0.6% and meets color criteria, and just about the structure criteria)

Cambic horizon 20/40 – 60 cm

Gleyic properties (?)

SOC average over 0-50 cm is 1.67 % (Humic)

Base saturation %> 60 throughout the profile (Eutric); Pantoeutric

RSG WRB2015: Gleysol

Full WRB 2015 classification:

Pantoeutric Fluvic oxygleyic (?) Mollic Gleysol (Anoclayic, Endoloamic, Humic, Tephric)

**Costa Rica, CR-002:**

0 - 30 cm: Umbric horizon

(BS% < 50%, Munsell colour value of ≤ 3 moist, soil structure moderate very fine subangular blocky, slightly hard)

Fluvic material (condition 2a obvious stratification throughout the profile)

Cambic horizon (45-135 cm) 2.5 hue redder than underlying horizon, texture finer than sandy loam

SOC 0-100 cm: 1.469%

RSG WRB 2015: Umbrisol

Full WRB 2015 classification:

Cambic Fluvic Umbrisol (Pantoloamic, Bathyclayic, Aric, Drainic, Profondihumic)

**Indonesia-048:**

Argic horizon (38-155 cm): Coarser textured horizon has > 10% clay and < 50% and ratio of the average clay content of the layer 38-155 cm to the layer between 0-38 cm is > 1.4 (criterion 2a of argic horizon) and Bt shows more than 5% clay coatings (criterion 2b of argic horizon).

CEC is low (< 24 cmolc.kg clay). Very low BS% (< 6)

No Ferralic horizon (< 10% water-dispersible clay, but CEC clay > 16 cmolc.kg-1 clay)

Possibly Ferric horizon (60-105 cm)

Stagnic properties (38-105 cm)

RSG: Acrisol

Ochric (> 0.2% SOC 0-10 cm) not humic (< 1% SOC 0-50 cm)

Stagnic properties. Yes, probably but > 25 cm and maximum 15% of the horizon (starting at 38 cm, therefore no Stagnosol).

Reducing conditions at 105 cm

CEC < 24 cmol.kg-1 clay from 12 cm downwards.

Very low base saturation (<10% below 3 cm)

No albic material

Ochric not Humic (> 0.2% SOC 0-10 cm and 0.635 SOC avg 0-50 cm and 1.842 avg SOC% over 0-10cm)

WRB 2015: Acrisol

Profondic (clay content does not decrease by > 20% from its maximum before 150 cm depth)

Not vetic (Al + exchangeable bases more than 6 cmol.kg-1 clay for most part of the profile)

Full WRB 2015 classification:

Ferric Stagnic Acrisol (Anoloamic, Endoclayic, Cutanic, Differentic, Hyperdystric, Ochric, Profondic, Phytotoxic)

Phytotoxic:

The breakpoints for affecting growth in wheat crops for the exchangeable Al concentration were detected at 0.56 and 2.56 cmol kg-1 for the Ultisol from Hunan and Anhui, respectively.

From: Determination of critical pH and Al concentration of acidic Ultisols for wheat and canola crops M Abdulaha-Al Baquy1,2, Jiu-yu Li1, Chen-yang Xu1,2, Khalid Mehmood1,2, Ren-kou Xu1

Solid Earth Discuss., doi:10.5194/se-2016-126, 2016 Manuscript under review for journal Solid Earth

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**Spring School 2018: Classification BW005, CN035, CR012 and IE01216**

(Niels)

**Profile BW-005**

WRB 2015:Stagnic Solonetz (Clayic, Columnic, Cutanic?, Hypernatric)

Profile description status (FAO 2006): 2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Feature** |  |  | **Naming** |  |
| Diag. horizon | Argic-like: clay skins , but salts (ESP>15% at 69-127 cm) 🡪 natric |  | natric horizon |  |
| Diag. properties | Stagnic |  |  |  |
| Diag. materials | Mineral soil |  |  |  |
| RSG |  |  | Solonetz | p.90 |
| Princ. qualifiers | Stagnic |  | Stagnic Solonetz |  |
| Suppl. qualifiers | Clayic , Columnic, (Cutanic?), Hypernatric |  | Stagnic Solonetz (Clayic, Columnic, Cutanic?, Hypernatric) |  |
|  |  |  |  |  |

Note:

* Not a mollic (2-43 cm), colour OK and OC content >0.6% but hard and massive.
* No Vertic at 91-127 as earlier indicated in ISIS, a.o. there are ‘still continuous clay skins and humus cutans’. Possibly , cutanic suppl. qualifier (natric, 2b condition).

**Profile CN035:**

WRB 2015:Endo-Gleyic Phaeozem (Aric, Pachic, Siltic) \*\*\*\*

Profile description status (FAO (2006): 1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Feature** |  |  | **Naming** |  |
| Diag. horizon | mollic |  |  |  |
| Diag. properties | endo-gleyic (120-150 cm) |  |  |  |
| Diag. materials | mineral materials |  |  |  |
| RSG |  |  | Phaeozem |  |
| Princ. qualifiers | Endo-Gleyic (sub qual) |  | Endo-Gleyic Phaeozem |  |
| Suppl. qualifiers | Aric (ploughed > 20 cm)  Pachic (mollic >= 50 cm thick)  Siltic (based on soil alanyses) |  | Endo-Gleyic Phaeozem (Aric, Pachic, Siltic) |  |
|  |  |  |  |  |

\*Chernic requirements?: 1: mineral material, ok ; 2: structure (OKish); 3: OC>= 1.0% (to 100/120 cm), ok; 3a: Munsell, value moist <=3 to 100 cm, chroma moist <=2); 5: >=1% absolute OC than parent material, NO; 6: BS>50%, ok; 7: >=25 cm, OK 🡪 **NO**\*\* Mollic requirements: 1: structure, OK’; 2: OC >=0.6%, up to 120 cm; 3: Hue, value, OK; 4: probably; 5: BS >=50%, ok; 6: thickness, sure (>=20 cm) 🡪 **OK**

\*\*\* Gleyic (p. 125) properties below 125 cm depth 🡪 Endo-Gleyic, p. 1

\*\*\*\* Discontinuous plough pan at 35 cm –-> suppl. qualifier: aric

**CRO12**

WRB 2015: Silandic Umbric Andosol (Pantho-siltic)

Profile description status (FAO (2006): 2/3

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Feature** |  |  | **Naming** |  |
| Diag. horizon | umbric (0-53 cm)  cambic (53-150 cm) |  |  |  |
| Diag. properties | andic (3 crit met, p. 63), possibly Silandic |  |  |  |
| Diag. materials | mineral (p.82) |  |  |  |
| RSG | Andosol (p.64) |  | Andosol |  |
| Princ. qualifiers | Silandic (?), umbric |  | Silandic Umbric Andosol |  |
| Suppl. qualifiers | Siltic |  | Silandic Umbric Andosol (Phanto-Siltic) |  |

* Silandic assumed (Siox >= 0.6 %)

**Profile IE035**

WRB 2015:Dystric Folic Gleysol (Siltic)

Profile description status (FAO (2006): 3

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Feature** |  |  | **Naming** |  |
| Diag. horizon | Folic (Histic?), 0-28 cm |  |  |  |
| Diag. properties | Gleyic (2.5Y/no; mottles) p. 131 |  |  |  |
| Diag. materials | Mineral soil |  |  |  |
| RSG |  |  | Gleysol |  |
| Princ. qualifiers | Folic, Dystric |  | Dystric Folic Gleysol |  |
| Suppl. qualifiers | Siltic |  | Dystric Folic Gleysol (Siltic) |  |
|  |  |  |  |  |

**Spring School 2018: Classification KE01, KE66, KE67, GR08 and ZW11** (Johan)

**Profile KE01**

WRB 2015: Rhodic Umbric Luvic Hypereutric Nitisol (humic)

Profile description status (FAO (2006): 1

Diagnostic horizon: nitic (but could be argic because the shiny ped surfaces and nutty peds are not indicated explicitly)

Nitic horizon is also argic with CEC/kg clay > 24 cmolc/kg and effective base saturation > 50%: luvic

Effective base saturation > 80% in some layer between 20-100 cm: hypereutric.

Organic carbon > 1%: humic

Base saturation < 50%: umbric

**Profile KE66**

WRB 2015: Pellic Vertisol (calcaric, hypereutric, relictigleyic, ochric)

Profile description status (FAO (2006): 1

Diagnostic horizon: vertic (15-64 cm)

Vertic horizon is gravelly but <40% in 90-100 cm: not skeletic.

Vertic properties extent into, buried, 2RC horizon

Effective base saturation > 80% in some layer between 20-100 cm: hypereutric.

Organic carbon > 0.2% and is not mollic, umbric or humic: ochric

Hue is 2.5Y with chroma is 0 (<2): gleyic properties, however no reducing conditions: relictigleyic. Note: this very dark grey (gleyic) colour could also be the result of the parent material (tuff).

CaCO3 is 2% (0-50 cm) and 7.6% in 2RC (50-75 cM0 thus below 15%: not calcic horizon but calcaric material

**Profile KE67**

WRB 2015:

WRB 2006: Luvic calcic horizon Vertic Kastanozem (Hyposodic Clayic)

15-90 cm argic horizon

secondary carbonates

vertic properties

WRB 2006: Chernic reducti-gleyic protocalcic/calcaric hypereutric Gleysol (clayic, luvic, sodic)

Profile description status (FAO (2006): 1

Group exercise: Does the profile have a chernic horizon? It meets all the criteria (except for the structure in the upper two horizons). If it will/would meet the criteria for a Chernic horizon, then the soil will be reclassified to a Chernozem. Of the parent material (Ck3) only the deepest layer meets the color criterion of the Chernic horizon.

**Profile GR08**

WRB 2015: Dystric Cambisol (loamic)

WRB 2006: Dystric Cambisol (loamic)

Profile description status (FAO (2006): 2 (no data on exchangeable acidity while pH is slightly acid)

Is effective base saturation < 50% ??

Group exercise: Amphi, Chromic Cambisol (Pantoloamic, Ochric)

**Profile ZW11**

WRB 2015:

WRB 2006: Abruptic petro/piso plinthic albic Acrisol (arenic, dystric, plinthofractic(?), ochric)

Profile description status (FAO (2006): 1