Wossac: 24486

A SOIL CLASSIFICATION FOR GREAT BRITAIN. B.W.AVERY (1968)

Comments by R.G.Sturdy. Noveber 1968.

1. General Comments.

(a) The classification (particularly the ped. class.) is complex and ranks as " a specialist system for the pedologist rather than one that " could be used in teaching and non-specialist discussion". (Fitzpatrick, 1957, Geoderma 1, p. 91)

(b) In that most profile and horizon characters have now been codified, and as far as possible given limits, the system is excellent. The codification of parent material, embraced by the lithological classification is also most welcome. It could be applied now without necessarily accepting the altered particle size limits and groupings.

(c) Some comments and criticisms follow :

2. Pedological vs. Lithological classifications.

The two are not independent of one another. Reference layers have to be identified pedologically before particle size differentiae can be applied to them. There is, therefore, doubtful significance of the proposed lithological classification standing on its own.

(see p. 45.)

3. Symbol Language.

(a) Double meaning of letters. In most cases the meaning of the same capital and lower case (l.c.) letters vis-a-vis the two sections of the classn. , when spoken, will be understandable from the context. When written down, the same letters are distinguished by position clearly enough. e.g. bt/bL is b/- and -/b

But p stands for podzolic characters and for ploughed layer in the ped. class. Also certain l.c.letters for diagnostic horizons in Organic soils differ from the same letters in the ped. class.

(b) Grouping and position of letters.

No difficulty in the lith. class. where 'prefix l.c. - Cap. - suffix l.c. rule always true.

In erecting taxonomic classes in the ped. class,

(i) double symbols could cause confusion. e.g. hggt could be construed as Ahg horizon and Bgt horizon

(ii) the order of the symbols is intended to reflect the order in which diagnostic horizons occur in the profile e.g. hgg, ggt. These soils are called humic stagley and argillic stagley respectively. Underlining the subject, thus : hgg, ggt , would make it clear which diagnostic horizon was giving rise to the class name (i.e. was a noun), and which was an adjectival qualifier. It would also indicate any unique grouping of l.c. letters which could not be subdivided, e.g. gg, GGG.

(c) Uniqueness and mutual exclusivity of some l.c. suffices.

See Table 1.

A Bt horizon is, apparently, not possible; only Bbt, Bgt, and Bdt. i.e. argillic properties only apply to B horizons qualifying as B, but which also show weathering, gleying, or fragipan development.

s only applies to E.

A Bsi horizon is not possible, therefore s and i are mutually exclusive.

(d) Specificity of ~~XYW~~ symbols.

In considering diagnostic horizons, some symbols are evidently nouns and refer to a specific master horizon e.g. b refers to a B horizon and no others. Others are evidently adjectival and indicate prporties which could be exhibited by more than one type of horizon, e.g. gg (more than one master horizon) , p (more than one l.c. suffix of the letter B.)

In addition, the spatial relationship in the profile of the diagnostic horizon is more variable when the diagnostic characters are less specific. This is just another way of admitting the known fact that, for example, podzols and surface water gley soils exhibit many different types of and combinations of horizon. Rules have, however, been laid down in the current proposals, even if they are tortuous to carry out.

4. Data Storage.

(a) See p.6., top of page. The use of symbols provides a ready made system of coding.

(b) However, difficulties may be encountered in using computers for data storage when distinguishing between capital and l.c. letters. Most line printers do not have lower case letters.

(c) Because the symbol system is not hierarchical in the ped. class., it is not always clear what level of generalisation has been reached when a symbol or group of symbols are encountered.

a.g. B alone is a master horizon; if no further differentiation made should use the symbol B- (see p.9)

~~XXXXX~~ Bs, Bg are master horizons with specific qualifying suffices. Bsg is a master horizon with a combined specific qualifying suffix. The three types of horizon Bs, Bg, and Bsg have equal value and do not represent different levels of generalisation.

4, (c) cont.

Is Bsg the same thing as Bgs ?

This sort of consideration will be important when trying to program a computer to do computations with data given in the symbol language form.

(d) However, as far as I understand, the use of the letter symbols suggested would be irrelevant if a computer was to be used to allocate soils to taxonomic classes, starting from raw input data (i.e. unsymbolised)

A computer, programmed with the complex rules for defining and distinguishing diagnostic horizons, would be able to deal with incoming profile data a lot faster than an individual. Any difficulties in such programming would largely reflect difficulties in applying the rules without computational aid , and would need to be rectified at once.

5. Keying.

As a corollary of the remarks in the para, above, it ought, once the classification has been agreed, to be possible to devise a key to aid the placement of a soil in its right class. This, and the lack of explanatory tabular material of the sort devised in table 1 , is acontributary factor to the apparent complexity of the proposals.

6. Field Recognition.

The recognition of certain types of horizon still depends on laboratory identification or confirmation. This is particularly true of organic matter content, and iron and sesquioxides content of Bh and Bs horizons.

This may affect the recognition of other horizons because they are partly defined by their spatial relation to the horizon whose field identification is not complete.

7. Further small points.

(a) Confusion may arise in typescript between l.c. 'el' (l), and arabic 'one' (1). Likewise, Roman 'one', I, could be misinterpreted as capital 'aye', I.

(b) Why not l/bt/dZx (p. 5.) instead of lbt/dZx, to show that three dimensions of the co-ordinate classification are being used ?

(c) Significant. The use of the word significant(ly) does not contribute much to definitions unless some measure of significance is indicated. In most cases there is no such measure. See pages 13, 15, 23, 25, 37, 45, 52.

(d) There seems to be some confusion of terminology in the discussion of degree of hydromorphy. See p. 29. Is 'very strongly hydromorphic' meant to be 'very strongly gleyed', on line 3 above t- Argillic horizon ?

(e) If the degree of intensity of the gleying process can be recognised sufficiently well to have the symbols g and (g), see p. 12, why not for other processes, e.g. Accumulation of argillic material t ? (Note, however, on p. 23 that (t) means uncertain identification of t)

(f) Constructing a soil formula for any particular profile, as per Fitzpatrick, can be easily achieved using the symbols for the master horizons and l.c. suffices. e.g. pedologically only, Ahg_{20} Eg_{15} Bg_{24} C (thickness of horizon in cm.)

Table 1.

Table to show the relationships between Master horizons and their lower case suffices.

		Lower case suffices.														
		l	f	a	p	h	g	s	b	t	d	c	i	r	z	y
Master Horizon	O	X	X		X	X										
	A				X	X	X					X?				
	E			X[1]			X		X		X					
	B					X	X	X[2]	X	X[3]	X	X	X			
	G											X	X	X[4]	X[5]	
	C										X	X				X[6]
	R[7]															

Notes:
1. a applies to E alone.
2. s applies to B alone
3. t applies to B alone
4. r applies to G alone
5. z applies to G alone.
6. y applies to C alone.
7. The master horizon R has no lower case suffices by definition.

Also, l, f, apply to O alone

The lower case suffices have been placed in the above order on the basis of : (i) the ~~xxxxx~~ correlation between l.c. suffix and master horizon extracted from the text. (may be some omissions or errors)

(ii) the weight attached to the various pedological processes implied by the relative order of l.c. suffices in horizons having more than one feature.

viz. Ahg

Egd, Eag.

Bbc, Bbt, Bbs, Bgd, Btd, Bgc, Bgt, Bhs, Bsg, Bgs

In particular, note : g > t > d

b > t, s, c.