

Soil Limitations to Crop Growth

Symbol	Soil Properties	Degree of Limitation					Notes
		Very Serious	Serious	Moderate	Minor	No Limitation	
a	Depth to top acid sulfate layer	0-25 cm from the surface	25-50 cm from the surface	> 50-100 cm from the surface	> 100-125 cm from the surface	> 125 cm from the surface	
C	Depth to top compacted layer (C) and massive layer (c) (cm from surface); e.g. (C) - Hard spodic/Ornstein/Duripan; (c)- saprolite shale and sandstone.	0 - 25 cm from the surface	> 25-50 cm from the surface	> 50-75 cm from the surface	> 75-100 cm from the surface	> 100 cm from the surface	
c		-	0-25 cm from the surface	> 25-50 cm from the surface	> 50-75 cm from the surface	> 75 cm from the surface	
D	Drainage	-	Excessive (9)	Somewhat excessive (8)	-	-	
d		-	Very poor to somewhat very poor (0-1)	Poor to somewhat poor (2-3)	Imperfect to somewhat imperfect (4-5)	Moderately well to well (6-7)	
GG	Gradient	Very steep (> 30°)	-	-	-	-	Assumption for conventional agriculture management.
G		Steep (25°-30°)	Very hilly (>20-25°)	-	-	-	
g		-	Hilly (>12-20°)	Rolling (>6 -12°)	-	Flat to undulating (<6°)	
N	Nutrient imbalance - Toxicity (N)	-	Due to high content of certain elements	-	-		(N) - According to Lab analysis.
n	CEC status (n)	-	-	<10 cmol(+)/kg soil	-	>10 cmol(+)/kg soil	

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O	Thickness of organic materials - dominantly fibric/hemic (O) or sapric (o)	>50cm from the surface (fibric)	25-50 cm from the surface (fibric)	< 25 cm from the surface (fibric)	-	-	
		-	>50cm from the surface (hemic)	25-50 cm from the surface (hemic)	< 25 cm from the surface (hemic)	-	
o		-	>100 cm from the surface (sapric)	>50-100 cm from the surface	25-50 cm from the surface (sapric)	<25 cm from the surface (sapric/OCM)	
R	Stoniness - Depth to thick (> 25 cm) rock fragments or gravels layer with the volume of >80% (R) or 35 - 80% (r)	0-25 cm from the surface	25-50 cm from the surface	50-75 cm from the surface	75-100 cm from the surface	> 100 cm from the surface	Stoniness depth is more than 25%.
r		-	0-25 cm from the surface 60 - 80 %	25-50 cm from the surface 60 - 80 %	50-75 cm from the surface 60 - 80 %	>75 cm from the surface 60 - 80 %	Reference : Guidelines For Soil Description - Field Legend of Malaysia
		-	-	0-25 cm from the surface 35 - 60%	25-50 cm from the surface 35 - 60%	>50 cm from the surface 35 - 60%	
s	Salinity	>4 dS/m	>2-4 dS/m	>1-2 dS/m	>0.5 - 1 dS/m	-	
T	Texture and structure	-	Coarse textured and Single grain (S, Single Grain; LcS, single grain) T2	Moderately coarse textured and weakly (fine to coarse) structured (LfS, weak SAB; SL, weak SAB) T1	-	-	

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t	Texture and structure	-	Fine textured and massive (HC, massive; C, massive; C;; SiC, massive) t2	Fine texture and strong coarse structure(C, prismatic; SiC, prismatic; HC, coarse angular blocky; SiC, Coarse angular blocky) t1	Fine to moderately fine textured and weakly structured (C, weakly structured; SiC, weakly structured; SCL, weakly structured; L, weakly structured; SiL, weakly structured) t0	Sandy clay, clay loam, Silty clay loam, Silt, Clay	
W	Woodiness - depth to thick wood layer	0-50 cm from the surface	50-100 cm from the surface	100-150 cm from the surface	150-200 cm from the surface	-	At least 5 attempts of auger penetration into the peat soil within 10 m radius.
H	Human influenced	Disturbed land - mining, buildings, roads etc.	-	-	-	-	Need to describe the disturbed land and ex-mining area according to the above reference

Soil Suitability Classes

- Class 1 - Soils with no limitations or minor limitations only.
- Class 2 - Soils with at least one moderate limitation with or without minor limitations.
- Class 3 - Soils with one serious limitation with or without moderate or minor limitations.
- Class 4 - Soils with two or more serious limitations with or without moderate or minor limitations.
- Class 5 - Soils with at least one very serious limitation with or without other limitations; i.e. serious, moderate, and minor limitations.

The severity of limitation(s) define the soil suitability class: other limitation(s), which is less severe shown in the bracket, underscore, and dot.

Class					Example
	Very Serious	Serious	Moderate	Minor	
5	Alphabet	()	-	.	5G(r)_n.ct
4		Alphabet	()	-	4Gt(dn)_c
3		Alphabet	()	-	3g(n)_c
2			Alphabet	()	2d(n)
1				Alphabet	1n

Example:

1n	Class 1 – one minor limitation (CEC status)
2d(n)	Class 2 – one moderate limitation (Drainage) and one minor limitation (CEC status)
3g(n)_c	Class 3 – one serious limitation (gradient), one moderate limitation (CEC status) and one minor limitation (Depth to compacted layer)
4Gt(dn)_c	Class 4 – two serious limitations (gradient and texture & structure), two moderate limitations (drainage and CEC status) and one minor limitation (CEC status)
5G(r)_n.ct	Class 5 – one very serious limitation (gradient), one serious limitation (stoniness), one moderate limitation (CEC status) and two minor limitations (Depth to compacted layer and texture & structure)