

Maughan C. & Amos, D. (2024) Plant bioindicators species guide

Scientific name	Common name(s)	Texture/Type	pH	Organic matter (OM)	Structure	Moisture	Nitrogen (N) / gen. fertility	Phosphorus (P)	Potassium (K)	Other nutrients	Crop Cover / Grazing	Notes / misc.
<i>Achillea millefolium</i>	Yarrow		E6 'weakly acid' [10]; Acid [10]	Loss of OM [5]; Low-medium OM [10]; Low humus [12]	Erosion; tillage/overgrazing [5]; Low porosity [12]	E5 'Moist-site indicator' [10]; Well-drained [10]; Low moisture [12]	E4 low/intermediate fertility [10]	Very low P [12]	Low K [1]; Very low [12]	Very low Ca [12]; Very high Mn [12]; High SO4 [12]; High Al [12]	Overgrazing [5]	Low aerobic bacteria [12]
<i>Aethusa cynapium</i>	Fool's parsley		Neutral/alkaline [2,6]; E7 'weakly acid to weakly basic' [10]			E4 dry to moist [10]	Nutrient rich [2]; Excess N [6]; E6 intermediate/ rich fertility [10]					Pollution by chemical fertilizers and pesticides. Excess salt. [6]
<i>Agrostis capillaris</i>	Bent, common		E4 Acid/moderately acid [10]; Prevalent on 'acid brown earth' (pH 4-6) [11]	Excess 'carbonised' plant OM; Lack of animal OM [5]	Compaction [5]	E5 'Moist-site indicator' [10]	Lack of N [5]; E4 low/intermediate fertility [10]; 'Poor' soils [11]					Can grow on soils "contaminated with lead and other heavy metals" [11]
<i>Alopecurus geniculatus</i>	Foxtail, marsh		E6 'weakly acid' [10]; pH 5.5-7 [11]	Low humus [12]	Low porosity [12]; Hard pan [12]	E7 'Dampness indicator' [10]; Flooded in winter [11]; Very high [12]; Poor drainage [12]	E6 intermediate/ rich fertility [10]; Fertile [11]		Very high K [12]	Very low Ca [12]; High Mg [12]; High Se, Al [12]		Anaerobic bacteria dominate [12]
<i>Alopecurus myosuroides</i>	Black-grass	Clay/heavy [2]	E7 'weakly acid to weakly basic' [10]	Burial of OM [5]	Plough pans / compaction / wet tillage [5]	Poorly drained/waterlogged [1,2]; E5 'Moist-site indicator' [10]	E6 intermediate/ rich fertility [10]					
<i>Alopecurus pratensis</i>	Foxtail, meadow		E6 'weakly acid' [10]; pH 5-7 [11]	Congestion with OM [5]	Anaerobic/asphyxiation [5]	Waterlogging, hydromorphisms, gleys, flood plains and wet meadows. [5]; E5 'Moist-site indicator' [10]; Moist [11]	E7 'richly fertile' [10]; Fertile [11]					Asphyxiation of aerobic microbial life [5]
<i>Anagallis arvensis</i>	Scarlet pimpernel	Light soils [5]	Prefers neutral pH [2]; pH indicator: red flower = $pH 6.5$, blue => pH 7; mix = neutral [5]; E6 'weakly acid' [10]	Low humus [12]	Well-drained, disturbed [5]	Well-drained [5]; E4 dry to moist [10]	Rich in nitrates [5]; E5 'intermediate fertility' [10]	Low P [12]		Low Ca [12]		Low aerobic bacteria [12]
<i>Anthoxanthum odoratum</i>	Sweet vernal grass	Cool soils [5]	E4 Acid/moderately acid [10]; pH 4.5-6 [11]	Rich in plant OM; Excess C; lack of animal OM [5]		E6 'moist/damp-site indicator' [10]; Damp [11]	E3 'more or less infertile' [10]; low to moderate fertility [11]	Low P [14]				High biodiversity [5]
<i>Anthriscus sylvestris</i>	Cow parsley		Alkaline [2]; Base-rich [5]; E7 'weakly acid to weakly basic' [10]	Mineralisation of OM [5]		Humid soils [2]; Waterlogged [5]; E5 'Moist-site indicator' [10]	E7 'richly fertile' [10]					
<i>Apera spica-venti</i>	Loose silky-bent	Light soils [2]; Sandy/silty, low in clay [7]; Dry sandy/light loams [11]	E5 'moderately acid soils' [10]	Balance of C and N [7]	Wet tillage [4]; Tillage when dry [7]	E4 dry to moist [10]	Balance of C and N [7]; E5 'intermediate fertility' [10]				Low cover [2]	
<i>Argentina anserina</i>	Silverweed		Rich in bases [5]; E7 'weakly acid to weakly basic' [10]	Congested with OM [5]; Low humus [12]	Low porosity [12]; Hard pan [12]	Waterlogged, excess irrigation, strong water contrast; hydromorphisms [5]; E7 'Dampness indicator' [10]; Very high [12]; Poor drainage [12]	E6 intermediate/rich fertility [10]		High K [12]	Very low Ca [12]; High Mg, SO4, B, Cl, Se [12];		Anaerobic bacteria dominate [12]
<i>Arrhenatherum elatius</i>	False oat-grass		Tolerates neutral to alkaline soils [2]; E7 'weakly acid to weakly basic' [10]; Neutral-base rich [11]; Avoids acid substrates [11]	Burying of plant OM during ploughing [5]; congested with C [5]	Deep [11]	E5 'Moist-site indicator' [10]; Well-drained [11]	E7 'richly fertile' [10]; Moderate-high fertility [11]				Rarely in well-grazed pasture [11]	Balanced meadows for <i>A. elatius</i> subsp. <i>elatius</i> . [5]
<i>Avena fatua</i>	Wild oat	Clay-limestone [5]	Weakly acid to weakly alkali [2]; High pH when compacted [5]; E7 'weakly acid to weakly basic' [10]; pH 4-8.5 [11]		Compaction [5]; Low porosity [12]	Moist [2]; E4 dry to moist [10]; Poor drainage [12]	Highly fertile [2]; Excess N (when compacted and high pH) [5]; E7 'richly fertile' [10]	Low P [12]	Excess K (when compacted and high pH) [5]	Low Ca [12]; High Mg, Mn, Fe, Cu, Zn, B, Se [12]		Salt tolerant [12]
<i>Bellis perennis</i>	Daisy, common	Chalky soils [2]; Clay [3]	pH >5.5 [2]; E6 'weakly acid' [10]	Deficiency of CHC and significant drop in fixing power (due to loss of Fe and Ca ions) [5]	Trampled grassland [2]; Beginning or ongoing erosion and leaching (due to decalcification) [5]	Wet for a period [2]; E5 'Moist-site indicator' [10]	E4 low/intermediate fertility [10]				Moderate amounts of bare ground [2]	

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<i>Bromus commutatus</i>	Brome, meadow	Heavy soils [2]	E8 'basic soils' [10]	Low humus [12]	Low porosity [12]	Moist [2]; E4 dry to moist [10]; Low [12]	E6 intermediate/ rich fertility [10]; Fertile [11]			Low Ca [12]; High Mg, Al [12]		Anaerobic bacteria dominate [12]
<i>Bromus diandrus</i>	Brome, great	Sandy [2,11]	E5 'moderately acid soils' [10]; wide range of pH [11]		Disturbed/cultivated [11]	E4 dry to moist [10]	E4 low/intermediate fertility [10]					
<i>Bromus hordeaceus</i>	Brome, soft		pH >5 [2]; E7 'weakly acid to weakly basic' [10]; Prefers neutral soils [11]	Congested with animal OM [5]	Disturbed soils [2]; Trampled meadows, compacted by livestock grazing in winter/wet [5]	Damp, but not waterlogged [2]; E4 dry to moist [10]	E4 low/intermediate fertility [10]; Prefers moderately fertility [11]				Overgrazing [5]	
<i>Bromus sterilis</i>	Brome, barren		E8 'basic soils' [10]; pH >6.5 [11]	Excess C [5]; Lack of manure [5]		Well drained [2,11]; E5 'Moist-site indicator' [10]	Low N [5]; E7 'richly fertile' [10]; Moderately fertile [11]	Low P [5]				
<i>Capsella bursa-pastoris</i>	Shepherd's purse	Silty or sandy soils [5]	Soils rich in bases [5]; E7 'weakly acid to weakly basic' [10]	Low humus [12]	Compaction (soils rich in bases) [5]	Avoids wet soils [2]; E5 'Moist-site indicator' [10]; Low [12]; Good drainage [12]	E7 'richly fertile' [10]	Blockage of P by anaerobic conditions [5]	Blockage of K by anaerobic conditions [5]; High K [12]	Very low Ca [12]; High Mn, Fe, SO ₄ , Cu, Zn, B, Al [12]		Saline tolerant [1,10,12]
<i>Cardamine flexuosa*</i>	Wavy bittercress		Acidic [5]; Rich in bases [5]; E6 'weakly acid' [10]	Saturated with fossiled OM [5]		Waterlogged [5]; Surroundings of springs and streams [5]; E7 'Dampness indicator' [10]	E6 intermediate/ rich fertility [10]					Siliceous soils [5]
<i>Cardamine pratensis*</i>	Cuckoo flower		E5 'moderately acid soils' [10]	Congested with OM [5]		Waterlogged / hydromorphisms [5]; E8 'damp/wet-site indicator' [10]	E4 low/intermediate fertility [10]					
<i>Carex spp.</i>	Sedges		pH 4.6-6.4 [10]	Low humus [12]	Low porosity [12]	Wet/waterlogged/poorly drained [1]; Poor drainage [12]; High [12]				Low Ca [12]		Anaerobic bacteria dominate [12]
<i>Centaurea cyanus</i>	Cornflower	Sandy loams/chalky clays [2]; Light, warm soils [4]	Blue = High lime [1]; Pink = Acid [1]; E6 'weakly acid' [10]		Hard pan [12]	Dry [4]; E5 'Moist-site indicator' [10]	E5 'intermediate fertility' [10]	Very low P [12]	High K [12]	Very low Ca [12]; High Mg, Mn, Fe, SO ₄ , Cu, Zn, B, Cl, Se [12]		Low aerobic bacteria [12]
<i>Centaurea nigra</i>	Knapweed		E6 'weakly acid' [10]; Acid soil [10]	Prefers unmanured sites [2]; Low humus [12]	Hard pan [12]	E5 'Moist-site indicator' [10]; High [12]; Poor drainage [12]	E5 'intermediate fertility' [10]		High K [1]; High level of K in soil [10]; High K [12]	Very low Ca [12]; High Mg, Se, Al [12]		Anaerobic bacteria dominate [12]
<i>Cerastium fontanum</i>	Common mouse-ear		Acidic [2]; E5 'moderately acid soils' [10]	Rich in OM [5]; OM in course of mineralization by aerobic microbial life [5]; Low humus [12]	Low porosity [12]; Hard pan [12]	Wetter soils [2]; E5 'Moist-site indicator' [10]; Low [12]	Nutrient rich [2]; Rich in N [5]; E4 low/intermediate fertility [10]	Very low P [12]	Very high K [12]	Low Ca [12]; High SO ₄ [12]		Low aerobic bacteria [12] Entries for [12] listed under ' <i>Cerastium vulgatum</i> '.
<i>Chenopodium album</i>	Fat hen	Loams/sandy [2]	High lime, Alkaline soil [3]; E7 'weakly acid to weakly basic' [10]	Humus rich [2]; Excess uncomposted animal OM [5]	Tillage [1]; Good tilth [4]; Wet tillage [5]	Moist [2]; E5 'Moist-site indicator' [10]	High N [2]; Surplus N at surface [4]; High fertility [1,3,4]; E7 'richly fertile' [10]	Very low P [12]	Very high K [12]			Fat hen is a nitrogen-loving plant characteristic of sudden nitrogen releases [5]
<i>Cichorium intybus</i>	Chicory	Clay, heavy [1] / silty [5]	Rich in bases [5]; E7 'weakly acid to weakly basic' [10]	Humus rich [1]; Low humus [12]	Tilled/cultivated [1]; Compaction (soils rich in bases) provoking anaerobic conditions [5]; Low porosity [12]	E4 dry to moist [10]; Imperfect drainage [10]	High fertility [1]; Excess N [5]; E5 'intermediate fertility' [10]	Blockage of P due to elevated pH [5]	Blockage of K due to elevated pH [5]	Low Ca [12]; High Mg, Mn, SO ₄ , Zn, B, Se [12]		Anaerobic bacteria dominate [12]
<i>Cirsium arvense</i>	Thistle, creeping	Clay/ heavy [1,4]	Rich in bases / high pH [5]; E7 'weakly acid to weakly basic' [10]	Excess spreading of fertiliser or OM / saturation of CHC [5]; Low humus [12]	Smear layer [4]; Low porosity [12]	Wet soil/slightly damp [2,4]; E6 'moist/damp-site indicator' [10]	Surplus N at depth [4]; E6 intermediate/rich fertility [10]	Blockage of P (excess fertiliser) [5]	K accumulator [10]; High K [12]	Low Ca, Cu [12]; Very high Fe [12]; Very low Mn [12]	Thin crops [2]	Overgrazing risks explosion of thistles due to excess OM and soil compaction [5]; Anaerobic bacteria dominate [12]
<i>Cirsium palustre*</i>	Thistle, marsh		E5 'moderately acid soils' [10]	Congested with OM [5]		Waterlogged, significant water contrast, hydromorphisms [5]; E8 'damp/wet-site indicator' [10]	Over-application of uncomposted manure/slurry [5]; E4 low/intermediate fertility [10]	Blockage of P (due to anaerobic conditions) [5]			Overgrazing of wet meadows [5]	

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<i>Cirsium vulgare</i>	Thistle, spear		E6 'weakly acid' [10]	Excess C/OM [5]; Humus deficiency [5]; Low humus [12]	Disturbed soils [2]; Low porosity [12]; Hard pan [12]	Well-drained [2]; Waterlogged (base rich soils) [5]; E5 'Moist-site indicator' [10]; High [12]	Fertile [2]; E6 intermediate/ rich fertility [10]	Blockage of P (due to humus deficiency and excess OM) [5]		Very low Ca [12]; High Mg, Zn, B, Al [12]; Low Mn [12]; Very high Fe [12]		
<i>Conopodium majus</i>	Pignut / earthnut	Non-calcareous [8]	Acidic [5]; E5 'moderately acid soils' [10]	Congested with ancient OM (base rich soils) [5]		E5 'Moist-site indicator' [10]	E5 'intermediate fertility' [10]				Old grasslands [8]	"Evolution towards the forest" [5]; Ancient woodland indicator [8]
<i>Convolvulus arvensis</i>	Bindweed, field	Sandy / light [1,3]; Deep, loose loams [2]	E8 'basic soils' [10]	Saturation of CHC by nitrogen of organic or synthetic origin [5]; Low humus [12]	Compaction, hardpan or crusty surface [1]; Compaction [5]	Dry [2]; E4 dry to moist [10]; Good drainage [12]	Nutrient rich [2]; Excess ammonium nitrate; Nitratophilic species [5]; E6 intermediate/rich fertility [10]	Very low P [12]	Very high K [12]	Very low Ca [12]; Very high Mg [12]		
<i>Crepis vesicaria</i> *	Hawk's-beard, beaked		E7 'weakly acid to weakly basic' [10]		Compaction of base-rich soils [5]	High water contrast [5]; E5 'Moist-site indicator' [10]	E7 'richly fertile' [10]		Blocking of K (due to anaerobic conditions) [5]			Mediterranean region or warm microclimate further north.
<i>Cynosurus cristatus</i>	Crested dogtail		Neutral to alkaline pH [2]; Rich in bases [5]; E6 'weakly acid' [10]	Rich in 'mineralisable' OM [5]		Well drained [2]; E4 dry to moist [10]	Low- to mid-fertility [2]; Nitratophilic species [5]; E4 low/intermediate fertility [10]					Biologically rich prairies. "Risk of anaerobic conditions if overgrazed/over-fertilised (esp. poor quality (i.e. slurry, non-composted)" [5]
<i>Dactylis glomerata</i>	Cock's-foot		Neutral/alkaline [2]; E7 'weakly acid to weakly basic' [10]	Saturation of CHC with N [5]; Excess C [5]	Compaction [5]	E5 'Moist-site indicator' [10]	Fertile [2]; Excess nitrates [5]; Nitrate-loving plant [5]; E6 intermediate/ rich fertility [10]	High P [12]	High K [12]	Very low Ca [12]; High Mn, Fe, SO ₄ , Zn, Cl, Al [12]; Very high Mg, Cu, B, Se [12]		
<i>Daucus carota</i>	Carrot, wild	Chalky soils [2]	E7 'weakly acid to weakly basic' [10]; Alkaline [10]	Medium OM [10]; Low humus [12]	Disturbed soils [2]; Compaction of base-rich soils [5]	Well-drained [2,12]; High water contrasts [5]; E4 dry to moist [10]; Low [12]	Infertile [2]; E3 'more or less infertile' [10]	Very low P [12]	Low K [12]	Low Ca [12]; High Fe, Cu, B, Cl, Se [12]		Thermophilic plant [5]; Low aerobic bacteria [12]
<i>Elymus repens</i> (syn. <i>Elytrigia repens</i>)	Couch Grass/ Quack grass	All soil types [2]	E7 'weakly acid to weakly basic' [10]; Alkaline [10]	Low humus [12]	Hardpan/crusty surface [1]; Smear layer/Compaction [4]; Compaction of loamy soils w/high pH / Over tillage [5]; Low porosity [12]	E5 'Moist-site indicator' [10]	High nutrient levels [4]; E7 'richly fertile' [10]	High P [12]	Excess potash [5]; High K [12]	Low Ca [12]; High SO ₄ , Zn, B, Cl, Se [12]; Very high Mg [12]	Gaps/sparse crops [4]	Fatigue of soils that require regeneration by a herbal ley [5]; Low aerobic bacteria [12]
<i>Epilobium montanum</i> *	Willowherb, broad-leaved		E6 'weakly acid' [10]	Congestion of soils in ancient plant OM [7]; Fossilisation of plant OM due to deficiency in aerobic microbial life [7]		Waterlogging [7]; E6 'moist/damp-site indicator' [10]	E6 intermediate/ rich fertility [10]					
<i>Equisetum arvense</i>	Horsetail, field	Sand/light [1]; Alluvial soils [5]; Sandy [12]	Acid or low lime [4]; E6 'weakly acid' [10]; Acid [10]; Slightly acid [10]	Low humus [12]	Smear layer [4]; Not yet structured/unstructured soils [5]; Low porosity [12]	Humid soil [3]; Presence of water table [5]; E6 'moist/damp-site indicator' [10]; Very high [12]; Poor drainage [12]	E6 intermediate/ rich fertility [10]	Very low P [12]	High K [12]	Very low Ca [12]; High B [12]		
<i>Euphorbia helioscopia</i> *	Sun spurge		E6 'weakly acid' [10]		Disturbed ground [5]	E5 'Moist-site indicator' [10]	E6 intermediate/ rich fertility [10]				Low cover [5]	
<i>Euphrasia officinalis</i>	Eyebright	Thin stony soils [5]	pH 7 or higher [5]; E5 'moderately acid soils' [10]	Saturation with OM [5]; lack of animal OM [5]; Low humus [12]	Disturbed soils [5]; Low porosity [12]	E5 'Moist-site indicator' [10]	N deficiency [5]; E3 'more or less infertile' [10]	Very low P [12]	High K [12]	Very low Ca [12]; High Mg [12]; Low Cu [12]		Anaerobic bacteria dominate [12]
<i>Fallopia convovulus</i>	Bindweed, black		Acid or low lime [2]; E7 'weakly acid to weakly basic' [10]	Humus deficiency [7]	Leaching, erosion, sunburn due to lack of soil cover [7]; Oxygen deficiency, asphyxiated soils [7]	Moist [2]; E4 dry to moist [10]	Fertile [2]; Excess N [7]; E5 'intermediate fertility' [10]				Low cover [7]	

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<i>Festuca rubra</i>	Fescue, red		Alkaline rich soils [2]; E5 'weakly acid' [10]; Mostly base-rich, pH >5 [11]	Congestion of soils with archaic OM [5]; animal OM deficiency [5]		E5 'Moist-site indicator' [10]	N deficiency [5]; E5 'intermediate fertility' [10]				Undergrazing [5]; Not found on exposed soils [2]	Red fescue indicates meadows rich in biodiversity, producing very high quality and good yield fodder for dairy cows and sheep. [5]
<i>Fumaria officinalis</i>	Fumatory	Loam/chalky [2]	High lime [2]; Rich in bases [5]; E7 'weakly acid to weakly basic' [10]	Excess C [5]; Low humus [12]		Good water availability [2]; E5 'Moist-site indicator' [10]	Nutrient rich [2]; E6 intermediate/ rich fertility [10]		High K [1,12]	Low Ca [12]; High Mg, Cl [12]		Indicator of good soil conditions [2]
<i>Galeopsis tetrahit</i>	Common hemp-nettle		Acid or low lime [2]; Rich in bases [5]; E6 'weakly acid' [10]	High OM [2]; Excess C [5]; Low humus [12]		Moist in summer [2]; E5 'Moist-site indicator' [10]	Low N [5]; E6 intermediate/ rich fertility [10]	Low P [5]; Very low P [12]		High Mg [12]		Excessive application of vegetable compost and of irrigation [5]
<i>Galium aparine</i>	Cleavers/ goosegrass	Clay/loam [2]	E7 'weakly acid to weakly basic' [10]; Alkaline [10]	Humus rich [2,4]; Low humus [12]	Compaction [3]; Smear layer [4]; Hard pan [12]; Low porosity [12]	Well watered [2]; E6 'moist/damp-site indicator' [10]; High [12]; Poor drainage [12]	High fertility [2,4]; Surplus N at surface [4]; E8 Rich/extremely rich [10]	Low P [12]	High K [12]	Low Ca [12]; High Mg [12]		Low aerobic bacteria [12]
<i>Galium uliginosum</i>	Fen bedstraw	Calcareous fens [8]	Neutral to acidic [9]; E6 'weakly acid' [10]			Poorly drained [9]; E9 'Wet-site indicator', often watersaturated [10]	E4 low/intermediate fertility [10]					
<i>Geranium dissectum</i>	Cut-leaved crane's-bill	Loams [2]	E7 'weakly acid to weakly basic' [10]	Low humus [12]	Loose [2]	E5 'Moist-site indicator' [10]; Low [12]	Nutrient rich [2]; Excess manure [5]; Excess mineral N and nitrates [5]; E6 intermediate/ rich fertility [10]	Very low [12]		Low Ca [12]; High Fe, Al [12]		
<i>Geranium robertianum*</i>	Herb robert		E6 'weakly acid' [10]	Rich in plant OM [5]		E6 'moist/damp-site indicator' [10]	E6 intermediate/ rich fertility [10]					"Evolution towards the forest" [5]
<i>Geranium molle</i>	Dove's-foot crane's-bill	Sandy [2]	pH >5 [2]; E7 'weakly acid to weakly basic' [10]	Rich in humus [2]; Excess manure [5]	Loose [2]	Moderately dry [2]; Low water retention [5]; E4 dry to moist [10]	Rich in nutrients [2]; Low nutrient retention [5]; Excess mineral N and nitrates [5]; E5 'intermediate fertility' [10]					
<i>Geum urbanum*</i>	Wood avens		E7 'weakly acid to weakly basic' [10]; Alkaline [10]	Rich in forest humus and congested with ancient carbonised OM [5]; Deficiency in animal MO [5]		E6 'moist/damp-site indicator' [10]	Deficient in N [5]; E7 'richly fertile' [10]					"Evolution towards the forest" [5]
<i>Glyceria declinata*</i>	Sweetgrass, small		E6 'weakly acid' [10]; pH 4-7 [11]		Trampling [11]	E8 'damp/wet-site indicator' [10]	E6 intermediate/ rich fertility [10]					
<i>Hedera helix</i>	Ivy	Sandy [12]	E7 'weakly acid to weakly basic' [10]; Alkaline [10]	Excess ancient plant OM [5]; Deficiency in animal OM [5]; Low humus [12]	Low porosity [12]	E5 'Moist-site indicator' [10]; Low [12]; Good drainage [12]	Deficient in N [5]; E6 intermediate/ rich fertility [10]	Low P [12]		Low Ca [12]; High B, Al [12]		"Evolution towards the forest" [5]
<i>Hieracium spp.</i>	Hawkweeds	Fine, sandy or rocky soil, low in clay [5]	Acid or low lime [1,3]; Rich in bases [5,6]; Very acidic [10]	Low to medium OM [10]; Low humus [12]	High porosity [12]	Low water retention [5,6]; Well drained [10]	Low N [5]; Low nutrient retention [5,6]	Low P [5,12]		Very low Ca [12]; High B, Cl [12]	Overgrazing [6]	
<i>Holcus lanatus</i>	Yorkshire fog		Weakly acidic [2]; E6 'weakly acid' [10]; Most abundant on pH 5-6 [11]	Rich in OM [5]		Moist [2]; Precursor of waterlogging [5]; E6 'moist/damp-site indicator' [10]	High fertility [2]; E5 'intermediate fertility' [10]; Most abundant on relatively fertile soils [11]	Low P [13]	Low K [13]			"Most widespread grass" in UK [11]
<i>Juncus effusus</i>	Rush, common		E4 Acid/moderately acid [10]	Excess C [5]		Wet/waterlogged/poorly drained [1,5]; gley [5]; E7 'Dampness indicator' [10]	E4 low/intermediate fertility [10]					
<i>Juncus spp.*</i>	Rushes			Excess C [5]		Wet/waterlogged/poorly drained [1,5]; Gley [5]						

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<i>Lactuca serriola</i>	Picky lettuce		Base rich soils [6]; E7 'weakly acid to weakly basic' [10]	Congestion of nitrogen-rich OM in base-rich soils. Saturation of the CHC by bases and nitrates. [6]; Low humus [12]	Hard pan [12]	E5 'Moist-site indicator' [10]; Low [12]; Poor drainage [12]	Nitrophilic species [6]; E6 intermediate/rich fertility [10]		Very high K [12]	Very low Ca [12]; Very high Mg [12]; High Mn, Fe, Al [12]		Low aerobic bacteria [12]
<i>Lamium amplexicaule</i>	Henbit dead-nettle	Sandy loam/light [2,12]	E7 'weakly acid to weakly basic' [10]	Excess OM (base rich soils) [5]; Low humus [12]	Erosion and leaching [5]; Low porosity [12]	Dry [2]; Low water retention capacity [5]; E4 dry to moist [10]	Nutrient rich [2]; Excess N (base rich soils) [5]; Low nutrient retention capacity [5]; E6 intermediate/rich fertility [10]			Low Ca [12]		Low aerobic bacteria [12]
<i>Lamium purpureum</i>	Red dead-nettle	Sandy loam [2]	E7 'weakly acid to weakly basic' [10]	Moderate OM [2]; Excess OM (base rich soils) [5]; Low humus [12]	Erosion and leaching [5]; Low porosity [12]	E5 'Moist-site indicator' [10]; Low water retention capacity [5]	Fertile, rich in nutrients [2]; Low nutrient retention capacity [5]; Excess N (base rich soils) [5]; E7 'richly fertile' [10]	Low P [12]	High K [12]	Low Ca [12]		Anaerobic bacteria dominate [12]
<i>Legousia hybrida*</i>	Venus's-looking-glass	Chalky soils [2]; Low clay [6]	Rich in bases [6]; E7 'weakly acid to weakly basic' [10]	Lack of humus [6]		E4 dry to moist [10]	Low N [2]; E4 low/intermediate fertility [10]					
<i>Leucanthemum vulgare</i>	Ox-eye daisy		Acidic [3]; E7 'weakly acid to weakly basic' [10]	Congestion of soils with ancient plant OM [5]; lack of animal OM [5]; Low humus [12]		E4 dry to moist [10]	N deficiency [5]; E4 low/intermediate fertility [10]	Very low P [12]	Very high K [12]	Low Ca [12]; Very high Mg [12]		Low aerobic bacteria [12]
<i>Lolium multiflorum</i>	Italian rye-grass		Moderate pH [2]; E7 'weakly acid to weakly basic' [10]		Compacted [7]; Disturbed soils [11]; Hard pan [12]	Well-drained [2]; E5 'Moist-site indicator' [10]; Moist [11]	High N [2]; Rich in N / excess Nitrates [7]; E7 'richly fertile' [10]; Rich [11]			Low Ca, Fe [12]; High Mg [12]		Nitrate-loving plant [7]
<i>Lolium perenne</i>	Rye grass, perennial	Thrives on heavy soils [11]	pH 5 to 8 [2]; E6 'weakly acid' [10]; wide pH range [11]	Congested with OM (leading to anaerobic conditions) [5]; excess animal OM [5]		Waterlogging in winter (leading to hydromorphisms and anaerobic conditions) [5]; strong contrast in wetness [5]; E5 'Moist-site indicator' [10]	Excess N [5]; E6 intermediate/rich fertility [10]			High Mg [12]; Low B [12]		Rye-grass is an excellent green fertilizer for poor soils - e.g. clay or destructurized - because it creates a pseudo-CHC through its air-tight network. This is the ideal species to sow to combat ragweed.
<i>Lotus corniculatus</i>	Bird's-foot trefoil		Rich in bases [5]; E6 'weakly acid' [10]			E4 dry to moist [10]	Low fertility [3]	Blockage of P [5]				
<i>Matricaria discoidea</i>	Pineapple weed	Sandy/Loam [2]	E7 'weakly acid to weakly basic' [10]	Low humus [12]	Compaction, hardpan or crusty surface [1]; Compaction, trampling (of base-rich soils) [5]; Mechanical destructuring in wet weather [5]; Hard pan [12]	Damp soils [2]; Tillage when wet [5]; E5 'Moist-site indicator' [10]	Nutrient rich [2]; E7 'richly fertile' [10]	Very low P [12]	Very high K [12]	Low Ca [12]; High Mg, SO4, Cu, Zn, B, Cl [12]	Overgrazing of base-rich soils [5]	
<i>Medicago lupulina</i>	Black medic		pH >7.5 [5]; E8 'basic soils' [10]	Low to medium OM [10]; Deficiency in animal OM [5]; Low humus [12]	Compaction causing anaerobic conditions [5]; Low porosity [12]	Dry soil [3]; E4 dry to moist [10]; Imperfect drainage [10]	Low N [1]; Deficiency in N [5]; E4 low/intermediate fertility [10]	P blocked due to high pH [5]		Very high Mg [12]; High Fe, SO4, Zn, B, Cl, Se, Al [12]		Good bacteria [12]
<i>Myosotis arvensis*</i>	Forget-me-not, field		E6 'weakly acid' [10]	Lack of clay, humus and OM [6]	Erosion, loose soil [6]	Low water retention capacity [6]; E5 'Moist-site indicator' [10]	Low nutrient retention capacity [6]; Low N [6]; E6 intermediate/ rich fertility [10]				Erosion due to low cover in winter [6]	There is no particular soil type associated with this weed" [2]; Salinisation due to excess irrigation [6]
<i>Orobanche minor*</i>	The hellroot / common broomrape		E8 'basic soils' [10]			E4 dry to moist [10]	E6 intermediate/ rich fertility [10]					

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Scientific name	Common name(s)	Texture/Type	pH	Organic matter (OM)	Structure	Moisture	Nitrogen (N) / gen. fertility	Phosphorus (P)	Potassium (K)	Other nutrients	Crop Cover / Grazing	Notes / misc.
<i>Papaver rhoeas</i>	Common poppy		Sudden increases in pH [5]; E7 'weakly acid to weakly basic' [10]		Newly cultivated soils [2]	Good moisture [2]; Contrasting: dry summer, wet winter [5]; E5 'Moist-site indicator' [10]	E6 intermediate/ rich fertility [10]				Low cover [2]	Very long seed persistence (up to 100 years) means that <i>P. rhoeas</i> appears in newly cultivated land [2]
<i>Persicaria maculosa</i> (<i>Polygonum persicaria</i>)	Redshank /lady's thumb	Sand/light [2]	Acid or low lime [1]; pH 5-7.2, Acidic soil [3]; E6 'weakly acid' [10]	Humus rich [2]; Excess C [5]	Well aerated [2]; Gley formation / anaerobic [5]; Cultivated or trampled when wet [5]; Low porosity [12]	Wet/waterlogged/poorly drained [1]; Humid soil [3]; Poorly drained [5, 12]; E6 'moist/damp-site indicator' [10]; High [12]	High fertility [2]; E7 'richly fertile' [10]	High P [12]		Low Ca [12]; High Mn, Zn [12]; Very high Cl [12]		Stop grazing and practice late mowing [5]
<i>Petroselinum segetum</i> *	Corn parsley		E8 'basic soils' [10]			E5 'Moist-site indicator' [10]	E6 intermediate/rich fertility [10]					
<i>Phleum pratense</i>	Timothy	Heavy [2,11]; Peaty [11]	Balance of bases [6]; E7 'weakly acid to weakly basic' [10]; pH >5 [11]	C/N and OM balance [6]; Low-medium OM [10]		Damp [2]; Moisture balance [6]; E5 'Moist-site indicator' [10]; Poor drainage [10]; Moist [11]; Good drainage [12]	C/N balance [6]; E6 intermediate/rich fertility [10]; 'Relatively fertile' [11]			High Mg, Cl, Al [12]; Very high SO4 [12]		
<i>Plantago lanceolata</i>	Plantain, ribwort	Sandy [12]	E6 'weakly acid' [10]; Neutral to alkaline [10]	Balance of OM/fertility/aerobic microbial activity [5]; Medium OM [10]; Low humus [12]	High porosity [12]	Moisture balance [5]; E5 'Moist-site indicator' [10]; Low [12]	E4 low/intermediate fertility [10]	High P [12]	Very high K [12]	Very low Ca [12]; Very high Mg [12]; High Mn, Fe, SO4, Cu, B, Cl, Se, Al [12]		
<i>Plantago media</i>	Plantain, hoary		Richness in bases / pH >=7.5 [5]; E7 'weakly acid to weakly basic' [10]	Low humus [12]		E4 dry to moist [10]	E3 'more or less infertile' [10]	Blockage of P due to elevated pH [5]; Very low P [12]	Blockage of K due to elevated pH [5]; High K [12]	Very low Ca [12]; High Zn, Al [12]		Low aerobic bacteria [12]
<i>Plantago major</i>	Plantain, broadleaf	Clay/heavy [1,3]	Acid or low lime [1]; E6 'weakly acid' [10]		Compaction [3,5]; Low porosity [12]; Hard pan [12]	Wet/waterlogged/poorly drained [3]; Anaerobic / hydric soils [5]; E5 'Moist-site indicator' [10]; Poor drainage [12]	E7 'richly fertile' [10]	High P [12]	High K [12]	High Ca, Mn, Fe, Zn, Se [12]; Very high B, Cl [12]		Anaerobic bacteria dominate [12]
<i>Poa annua</i>	Meadowgrass, annual		E6 'weakly acid' [10]; Wide pH range [11]		Heavily disturbed [2,11]; Compaction [3,5]; Erosion and leaching of soils [5]; Trampling [5,11]; Low porosity [12]	Humid soil [3]; Low water retention capacity [5]; E5 'Moist-site indicator' [10]; High [12]; Poor drainage [12]	Fertile [2]; High fertility [3]; Low nutrient retention [5]; E7 'richly fertile' [10]		Very high K [12]	Low Ca [12]; Very high Mg, Zn [12]; High Mn, Fe, Cu, B, Cl, Se [12]	Overgrazing [5,11]	Low aerobic bacteria [12]
<i>Poa trivialis</i>	Meadowgrass, rough stalked		pH>5 [2]; E6 'weakly acid' [10]	Excess C [5]; Good humus [12]	Good porosity [12]	Moisture retentive [2]; Waterlogged [5]; E6 'moist/damp-site indicator' [10]; 'Moist' [11]; Good [12]	Excess mineral N [5]; E6 intermediate/rich fertility [10]; Fertile [11]	Excess P [5]		High Ca, Mg [12]	Overgrazing [5]	Entries for [12] listed under ' <i>Poa compressa</i> '.
<i>Polygonum aviculare</i>	Common knotgrass/ Prostrate knotweed		Acid or low lime [1,3]; E6 'weakly acid' [10]; 'Slightly acidic' [10]	Low humus [12]	Compaction [3,5]; Erosion (summer) [5]; Low porosity [12]	Well drained/not waterlogged [2]; E5 'Moist-site indicator' [10]; Poor drainage [12]	High fertility [2]; Excess nitrates/nitrites (bare soil) [5]; E7 'richly fertile' [10]	Very low P [12]	Very high K [12]	Very low Ca [12]; Very high Mg [12]; High Se, Al [12]	Low cover [2,5]	Soils left bare and unprotected after harvest [5]; Anaerobic bacteria dominate [12]; High salt [12]
<i>Quercus robur</i> *	Oak, English		E5 'moderately acid soils' [10]	Congestion with OM [5]		Waterlogging [5]; E5 'Moist-site indicator' [10]	Low N [5]; E4 low/intermediate fertility [10]					
<i>Ranunculus acris</i>	Buttercup, meadow		Acid [10]; E6 'weakly acid' [10]	Start of CHC saturation [5]; Low humus [12]	Start of asphyxiation [5]	Start of waterlogging [5]; E6 'moist/damp-site indicator' [10]; Poor drainage [10]; High [12]	E4 low/intermediate fertility [10]	Very low P [12]	Very high K [12]	Very low Ca [12]; Very high Mg, Mn [12]; High Fe, SO4, Cu, B, Se [12]	Overgrazing (when dominant) [5]	When not dominant, buttercup indicates balanced and biologically rich grasslands. [5]
<i>Ranunculus arvensis</i>	Buttercup, field		Soils rich in bases or with high pH [5]; E7 'weakly acid to weakly basic' [10]	Low humus [12]	Hard pan [12]	High water contrast [5]; E5 'Moist-site indicator' [10]	E6 intermediate/rich fertility [10]	Low P [12]	High K [12]	Very low Ca [12]; High Mg, Mn, SO4, Cu, Se, Al [12]		Sensitive species: its presence indicates soils not intoxicated by pesticides [5]; Low aerobic bacteria [12]; High salt [12]

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<i>Ranunculus repens</i>	Buttercup, creeping	Clay/heavy [1,2,3]	Lime deficiency [4]; E6 'weakly acid' [10]	Excess C [5]; Low humus [12]	Compaction / cultivation of the soil when wet [5]; Hard pan [12]	Humid soil [3]; wet/waterlogged/poorly drained [1,5]; E7 'Dampness indicator' [10]	Surplus of nitrogen (nitrates) on the surface [4]; E7 'richly fertile' [10]		High K [12]	Very low Ca [12]; High Mg [12]	Overgrazing [5]	Hydric soils [5]; Low aerobic bacteria [12]
<i>Raphanus raphanistrum</i>	Runch/Wild radish	Sandy/loam [2]; Sandy [12]	Acid or low lime [1]; Lime deficiency [4]; Excess lime [5]; E6 'weakly acid' [10]	Low humus [12]	Compaction of soils rich in bases provoking anaerobic conditions [5]; High porosity [12]; Hard pan [12]	Extreme contrasts in moisture (dry then wet) [5]; E5 'Moist-site indicator' [10]	Low fertility [1]; High nutrient levels [2,4]; Surplus N at surface [4]; E6 intermediate/rich fertility [10]	Blockage of P due to anaerobic conditions [5]; Very low P [12]	Blockage of K due to anaerobic conditions [5]; Very high K [12]	Very low Ca, Mn [12]; Very high Mg, Fe [12]; High SO ₄ , B, Cl, Al [12]		Low aerobic bacteria [12]; High salt [12]
<i>Rhinanthus minor</i> *	Yellow rattle		E6 'weakly acid' [10]	Deficiency in OM, particularly in animal OM. [5] OM in the process of fossilisation [5]		E5 'Moist-site indicator' [10]	N deficiency [5]; Low fertility meadows [5]; E4 low/intermediate fertility [10]		K deficiency [5]			
<i>Rubus fruticosus</i> agg.	Blackberry		E6 'weakly acid' [10]	Congestion of soils with archaic plant OM [5]		E6 'moist/damp-site indicator' [10]	E6 intermediate/rich fertility [10]	Low P [12]	High K [12]	Low Ca [12]; High Cu, Se [12]		
<i>Rumex acetosa</i>	Sorrel, common		Acid or low lime [1]; Slightly acidic [5]; E5 'moderately acid soils' [10]	OM balance [5]; Low humus [12]		Wet/waterlogged/poorly drained [1]; Good moisture [5]; E5 'Moist-site indicator' [10]	E4 low/ intermediate fertility [10]	Very low P [12]		Very low Ca [12]; High Mg, Fe, Al [12]		High value fodder [5]; Low aerobic bacteria [12]
<i>Rumex acetosella</i>	Sorrel, sheep's	Sand / light [1,12]; Clay-limestone soils [5]	Acid or low lime [1,3,10]; E4 Acid/moderately acid [10]	Absence, loss of humus due to a lack of animal OM [5]; Low humus [12]	Destruction of CHC by mineral manures and agri-chemicals [5]; Low porosity [12]	Humid soil [3]; Low water retention capacity [5]; E5 'Moist-site indicator' [10]; High [12]; Poor drainage [12]	Low fertility [3]; Low nutrient retention [5]; E3 'more or less infertile' [10]	Low P [12]		Very low Ca [12]; High Mg, Se, Al [12]		Destruction of CHC by mineral manures and agri-chemicals / begins to proliferate in good clay-limestone soils [5]
<i>Rumex conglomeratus</i> *	Dock, green		E7 'weakly acid to weakly basic' [10]	Soils saturated with fossil organic matter [7]		Waterlogging [7]; Hydromorphisms producing Al+++ and Fe++ ions [7]; E8 'damp/wet-site indicator' [10]	Nitrites (due to waterlogging) [7]; E7 'richly fertile' [10]					
<i>Rumex crispus</i>	Dock, curly	Clay loams [2]	Acidic soil [3]; Alkaline soils [5]; E7 'weakly acid to weakly basic' [10]	Excess C [5]	Compacted [2]; Anaerobic [5]; Hard pan [12]	Damp soils [2]; Waterlogging [5]; Hydric soils / anaerobic [5]; E6 'moist/damp-site indicator' [10]; Poor drainage in the top soil [10]; Poor drainage [12]	Nutrient rich [2]; Blockage of trace-elements (due to anaerobic conditions) [5]; E6 intermediate/rich fertility [10]	High P [5]; Blockage of P (due to anaerobic conditions) [5]; Very high P [12]	High K [5]; Very high K [12]	Low Ca [12]; Very high Mg, Mn, Se [12]; High Fe, SO ₄ , Cu, Zn, Boron, Cl [12]		Any further application of OM can lead to irreversible damage [5]; Low aerobic bacteria [12]; High salt [12]
<i>Rumex obtusifolius</i>	Dock, broad-leaved	Clay/heavy [1,2,3]	Acid or low lime [4,5]; E7 'weakly acid to weakly basic' [10]	Humus rich [2]; Excess C [5]	Compaction [2]; Anaerobic [5]	Wet/waterlogged/poorly drained [2,5,12]; E5 'Moist-site indicator' [10]	High N [2]; High fertility [2]; Surplus N (nitrates) in deeper soil layers [4]; Blockage trace-elements (due to anaerobic conditions) [5]; E9 'Indicator of extremely rich situations' [10]	Blockage of P (due to anaerobic conditions) [5]; Very low P [12]	Very high K [12]	Very low Ca [12]; High Mn, Fe, Cu, Zn, Al [12]		Any further application of OM can lead to irreversible damage / Destruction of clay-humic complexes resulting in the release of aluminium, iron, and nitrates [5]; Low aerobic bacteria [12]; High salt [12]
<i>Sanguisorba minor</i> *	Salad burnet		Prefers soils with high pH than on acid soils [5]; Rich in bases [5]; E8 'basic soils' [10]	Congested with archaic OM [5]		Strong contrasts in hydration [5]; Low water retention [5]; E4 dry to moist [10]	Low nutrient retention [5]; E3 'more or less infertile' [10]					
<i>Senecio vulgaris</i>	Groundsel	Sandy loams [2]; Sandy [12]	pH >6 [2]; Base rich [5]; E7 'weakly acid to weakly basic' [10]	Humus rich [1]; Excess C [5]; Low humus [12]	Loose [5]; Erosion [5]; Low porosity [12]	Low water retention capacity [5]; E5 'Moist-site indicator' [10]; Good drainage [12]	High fertility [1]; Excess N (base rich soils) [5]; Low nutrient retention capacity [5]; E7 'richly fertile' [10]	Very low P [12]		Low Ca [12]; High Mg, Fe, Se, Al [12]	Low cover [5]	Low aerobic bacteria [12]
<i>Sherardia arvensis</i> *	Blue field madder		E6 'weakly acid' [10]			E4 dry to moist [10]	E4 low/intermediate fertility [10]					

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Scientific name	Common name(s)	Texture/Type	pH	Organic matter (OM)	Structure	Moisture	Nitrogen (N) / gen. fertility	Phosphorus (P)	Potassium (K)	Other nutrients	Crop Cover / Grazing	Notes / misc.
<i>Silene latifolia</i>	White campion/ cockle	Sand/light [1]; Sandy, silicon, granite [5]	Rich in bases [5]; E7 'weakly acid to weakly basic' [10]	Excess C [5]; Low humus [12]	Low porosity [12]	Well-drained [2]; E4 dry to moist [10]	Low N [5]; E6 intermediate/rich fertility [10]	Low P [5]		Very low Ca [12]; High Mg, Mn, Fe, Zn, B, Se [12]		"Evolution towards the forest" [5]; Low aerobic bacteria [12]
<i>Sinapis arvensis</i>	Charlock/Wild mustard	Sandy [12]	Alkaline rich [2]; Over-application of lime [5]; 'Blockages' due to rising pH [5]; E7 'weakly acid to weakly basic' [10]	High OM [2]; Low humus [12]	Well aerated [2]; Compaction, leading to anaerobic conditions (in high pH soils) [5]; High porosity [12]; Hard pan [12]	Dry often with thin topsoil [1]; Well-drained [2]; E5 'Moist-site indicator' [10]; Poor drainage [12]	E7 'richly fertile' [10]	Blockage of P [5]; High P [12]		Very low Mn [12]		Mustard is an acidifying plant and an excellent green fertilizer on soils with a high pH. On slightly heavy, moist, acidic soils, a green manure of field mustard or white mustard can be a real disaster for the soil structure. [5]; High salt [12]
<i>Sisymbrium officinale</i>	Hedge mustard	Sandy, loam, stony [2]	Excess lime / rich in bases [5]; E7 'weakly acid to weakly basic' [10]	Low humus [12]	Loose [2]; Compaction by animals [5]; Low porosity [12]; Hard pan [12]	E4 dry to moist [10]; Poor drainage [12]	Nutrient rich [2]; E7 'richly fertile' [10]	Blockage of P (anaerobic) [5]		Very low Ca, Mn [12]; Very high Mg [12]; High Fe, SO ₄ , Cu, Zn, B, Cl, Se, Al [12]		Anaerobic bacteria dominate [12]; High salt [12]
<i>Sonchus arvensis</i>	Sow-thistle, perennial	Heavy, deep loams and clays [2]	High lime [1]; Base-rich [5]; E7 'weakly acid to weakly basic' [10]; Alkaline [10]	Excess C [5]; Medium-high OM [10]; Low humus [12]	Anaerobic / compaction in wet weather [5]	Wet/waterlogged/poorly drained [1,10]; Damp to wet [2]; Waterlogged (esp. in base-rich soils) [5]; E6 'moist/damp-site indicator' [10]; High [12]	High in nitrates [2]; E6 intermediate/rich fertility [10]		Very low K [12]	Very low Ca [12]; High Mg, Se [12]		Nitrite-loving plant [5]
<i>Sonchus asper</i>	Sow-thistle, prickly	Loams/sandy/stony [2]	E7 'weakly acid to weakly basic' [10]	Excess C [5]		Not too dry [2]; Waterlogging [5]; Anaerobic [5]; E5 'Moist-site indicator' [10]	N/nutrient rich [2]; Excess N [5]; E6 intermediate/rich fertility [10]	High P [12]	Excess K [5]; Very high K [12]	Very low Ca [12]; Very high SO ₄ , B [12]; High Mg [12]		Nitrite-loving plant [5]; Anaerobic bacteria dominate [12]
<i>Sonchus oleraceus</i>	Sow-thistle, smooth	Clay/heavy [1]; Loams/sandy/stony [2]	E7 'weakly acid to weakly basic' [10]	Excess C [5]		Not too dry [2]; Waterlogging [5]; Anaerobic [5]; E5 'Moist-site indicator' [10]	N/nutrient rich [2]; Excess N [5]; E7 'richly fertile' [10]	Very low P [12]	Excess K [5]; Very high K [12]	Low Ca [12]; Very high Mg [12]; High Mn, Fe, SO ₄ , Cu, Zn, B [12]		Nitrite-loving plant [5]
<i>Spergula arvensis</i>	Corn spurry	Sand/light [1,2,3,12]	Acid or low lime [1,2,5]; E5 'moderately acid soils' [10]	Loss of CHC due to lack of humus [5]	Leaching/erosion [5]	Excess irrigation [5]; E4 dry to moist [10]; Good drainage [12]	Low nutrient retention (in acid soils) [5]; E5 'intermediate fertility' [10]	High P [12]	Very high K [12]	Low Ca [12]; High Mg, Mn, Fe, SO ₄ , Cu, Zn, B, Cl, Se [12]	Erosion and leaching due to lack of soil cover [5]	Calcium deficiency [5]
<i>Stellaria graminea*</i>	Stitchwort, lesser		E5 'moderately acid soils' [10]	Soils rich and balanced in OM [6]		Water balance [6]; E6 'moist/damp-site indicator' [10]	Nitrate rich/balanced [6]; E4 low/intermediate fertility [10]					"Active aerobic microbial life" [6]
<i>Stellaria media</i>	Chickweed, common		Neutral/alkaline [2]; E6 'weakly acid' [10]	Humus rich [1,3]; Active mineralization of OM by aerobic bacteria [5]; Low humus [12]	Low porosity [12]	Watered but not waterlogged [2]; E5 'Moist-site indicator' [10]	Nitrogen rich [2,4]; Surplus N at surface [4]; Release of nitrates [5]; 'Soil balance' [5]; E7 'richly fertile' [10]	Very low P [12]	Very high K [12]		Low crop cover, sparse crops [4]	Active mineralization of OM by aerobic bacteria [5]
<i>Taraxacum officinale</i> agg.	Dandelion	Clay/heavy [1,3]	Acid or low lime [1]; pH >7 [2]; Lime deficiency [4]; E7 'weakly acid to weakly basic' [10]	Good humus [3]; Low humus [12]		E5 'Moist-site indicator' [10]; Good drainage [12]	High fertility [3]; Surplus N on the surface and in deeper soil layers [4]; E6 intermediate/rich fertility [10]		Very high K [12]	Very low Ca [12]; High Cl [12]		
<i>Trifolium pratense*</i>	Clover, red		E7 'weakly acid to weakly basic' [10]			E5 'Moist-site indicator' [10]; low moisture retention capacity [5]	Low nutrient retention capacity [5]; E5 'intermediate fertility' [10]			Calcium-depleted [5]		Root exudates of <i>T. pratense</i> can break the dormancy of the seeds of <i>Rumex obtusifolius</i> , leading to a massive and sudden germination. [5]

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Scientific name	Common name(s)	Texture/Type	pH	Organic matter (OM)	Structure	Moisture	Nitrogen (N) / gen. fertility	Phosphorus (P)	Potassium (K)	Other nutrients	Crop Cover / Grazing	Notes / misc.
<i>Trifolium repens</i>	Clover, white	Thin topsoil [1]	Compaction of soils rich in bases [5]; E6 'weakly acid' [10]	Congested with OM [5]	Uncultivated/neglected [1]; Compaction of soils rich in bases [5]; Trampling by livestock [5]	Dry [1]; Waterlogging [5]; Contrasts in hydration [5]; E5 'Moist-site indicator' [10]; Good drainage [12]	Low fertility/N [1]; E6 intermediate/rich fertility [10]			High Mg, Fe, SO ₄ , Cu, Zn, B, Cl, Se [12]	Overgrazing [5]	
<i>Tussilago farfara</i>	Colt's foot	Clay/heavy [1]	Acid or low lime [1]; Rich in bases [5]; E6 'weakly acid' [10]		Instability (soils rich in bases and clay) / moving soils [5]	Wet/waterlogged/poorly drained [1]; Humid soil [3]; Pockets of water [5]; E6 'moist/damp-site indicator' [10]	E6 intermediate/rich fertility [10]					
<i>Urtica dioica</i>	Nettle, common	Sand/light [3]	Acid or low lime [1]; E7 'weakly acid to weakly basic' [10]	Excess C [5]; Low humus [12]	Hard pan [12]	Hydric soil [5]; E6 'moist/damp-site indicator' [10]; High [12]; Poor drainage [12]	Nutrient rich [2]; E8 Rich/extremely rich [10]	Very low P [12]	Very high K [12]	Very low Ca [12]; Very high Mg, Fe, SO ₄ , Cu, Se [12]; High Mn, Zn, B, Cl, Al [12]		Change of state of iron in soil [5]; Pollution by iron [5]; Anaerobic bacteria dominate [12]
<i>Urtica urens</i>	Nettle, small		E6 'weakly acid' [10]	Excess animal OM (pollution by poultry) [5]		Hydromorphisms due to excess K from animal OM [5]; E5 'Moist-site indicator' [10]	E8 Rich/extremely rich [10]	Very low P [12]	Hydromorphisms due to excess K from animal OM [5]; Very high K [12]	Low Ca [12]; Very high Mg [12]; High Fe, Cu [12]		
<i>Veronica chamaedrys</i>	Speedwell, germander	Loams [2]	pH 6-8 [2]; Rich in bases [5]; E6 'weakly acid' [10]	Rich in OM [5]	Compaction leading to anaerobic conditions [5]	Dry often with thin topsoil, well drained [1]; E5 'Moist-site indicator' [10]	Nutrient rich [2]; Rich in N [5]; E5 'intermediate fertility' [10]					
<i>Veronica hederifolia</i> *	Speedwell, ivy-leaved		E7 'weakly acid to weakly basic' [10]	Nutrient rich [2]	Loose [2]	E5 'Moist-site indicator' [10]	E6 intermediate/rich fertility [10]					
<i>Veronica persica</i>	Speedwell, field	Loams [2]	pH 6-8 [2]; Rich in bases [5]; E7 'weakly acid to weakly basic' [10]	Rich in OM [5]	Compaction leading to anaerobic conditions [5]	Dry often with thin topsoil, well drained [1]; E5 'Moist-site indicator' [10]	Nutrient rich [2]; Rich in N [5]; E7 'richly fertile' [10]					Nitrate-loving species / NB: if excess contributions [of N], bindweed will appear, then thistles and dock [5]
<i>Vicia sativa</i>	Vetch, common	Sandy [2,12]	Rich in bases [5]; E7 'weakly acid to weakly basic' [10]		Compaction (causing anaerobic conditions) [5]	Dry [2]; E4 dry to moist [10]; Good drainage [12]	Low N [1]; E4 low/intermediate fertility [10]	Blockage of P (due to anaerobic conditions) [5]; High P [12]	Blockage of K (due to anaerobic conditions) [5]	Very low Ca [12]; Very high Mn, B [12]; High Fe, SO ₄ , Cu, Zn [12]		
<i>Viola arvensis</i>	Pansy, field	Sand/light [3]	Acid or low lime [1,3]; E6 'weakly acid' [10]	Lack of humus [7]	Aerated [2]	Watered but not waterlogged [2]; E4 dry to moist [10]	Low N [7]; E6 intermediate/rich fertility [10]					

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Abbreviations			
OM	= Organic matter	Cl	= Chlorine
CHC	= Clay-humic complex	Mn	= Manganese
N	= Nitrogen	Zn	= Zinc
P	= Phosphorus	Fe	= Iron
K	= Potassium	Al	= Aluminium
C	= Carbon	B	= Boron
Ca	= Calcium	Cu	= Copper
SO ₄	= Sulphates	Se	= Selenium
Mg	= Magnesium	agg.	= aggregate species
*	= Plant species with two or fewer bibliographic sources		
	= Two or more sources in agreement		
	= Disagreement between two or more sources		

Note on publication: this database was compiled and arranged by Chris Maughan (Centre for Agroecology Water and Resilience) and Domic Amos (Organic Research Centre) using the above sources. For correspondence please email chris.maughan@coventry.ac.uk

Scientific name	Common name(s)	Texture/Type	pH	Organic matter (OM)	Structure	Moisture	Nitrogen (N) / gen. fertility	Phosphorus (P)	Potassium (K)	Other nutrients	Crop Cover / Grazing	Notes / misc.
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Ellenberg indicator values			
EIV#	pH	Moisture	Nitrogen
E1	Indicator of extreme dryness, restricted to soils that often dry out for some time	Indicator of extreme dryness, restricted to soils that often dry out for some time	Indicator of extremely infertile sites
E2	Between 1 and 3	Between 1 and 3	Between 1 and 4
E3	Acidity indicator, mainly on acid soils, but exceptionally also on nearly neutral ones	Dry-site indicator, more often found on dry ground than in moist places	Indicator of more or less infertile sites
E4	Between 3 and 5	Between 3 and 5	Between 3 and 6
E5	Indicator of moderately acid soils, only occasionally found on very acid or on neutral to basic soils	Moist-site indicator, mainly on fresh soils of average dampness	Indicator of sites of intermediate fertility
E6	Between 5 and 6	Between 5 and 6	Between 5 and 7
E7	Indicator of weakly acid to weakly basic conditions; never found on very acid soils	Dampness indicator, mainly on constantly moist or damp, but not on wet soils	Plant often found in richly fertile places
E8	Between 7 and 9	Between 7 and 9	Between 7 and 10
E9	Indicator of basic reaction, always found on calcareous or other high-pH soils	Wet-site indicator, often on watersaturated, badly aerated soils	Indicator of extremely rich situations, such as cattle resting places or near polluted rivers