Guide

Legend.

U = unmown grasslands only
M = mown grasslands only
UM = either

Each question has a pair of possible forms: follow the one which corresponds to your specimen of grass. Use fresh material, not dried, and look at several shoots if in doubt - all wild plants are variable.

1 Ligule a fringe of hairs

Yes Common reed *Phragmites australis*. Patch-forming perennial, 1-2 m tall. U. Wet soil D.

No [2]

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2 All leaf blades very narrow (<1 mm wide) [3]

Leaf blades wider [6]

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3 Ligule long (1-3 mm), stiff leaf blades

Wavy hair-grass **Deschampsia flexuosa*. UM. Infertile, acid soil E.

Ligule very short (<1 mm, usually <0.5 mm) [4]

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* Early hair-grass *Aira praecox* may key out here, but is an annual of infertile, sandy soils, dying in summer.

Agrostis canina may also key here, but usually has wider leaf-blades (1-3 mm).

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4 Leaf-blades sharp-pointed, rigid, hard. Roots cord-like, coarse. Basal leaf-sheaths shiny

Mat-grass *Nardus stricta*. UM. Infertile, acid soil E.

Not as above fescues, [5]

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5 Tufted with open leaf-sheaths, tufts look 'curly'

Sheep's fescue *Festuca ovina* or fine-leaved sheep's-fescue *F. tenuifolia*. UM. Infertile soil EF (*F. tenuifolia* on acid soils only).

Creeping with rhizomes, or if tufted then with tubular leaf-sheaths (beware, sheaths split easily - look at several shoots)

Red fescue - various sub-spp. *Festuca rubra*. UM. Common on most dry soils, but dominant on infertile ones FG.

(Fescues are difficult to identify - this guide only splits them to the extent needed to determine soil type.)

6	Youngest leaf blade rolled in shoot	7
	Youngest leaf blade folded in shoot	18
7	Auricles present	8
	Auricles absent	9
8	Creeping species with white/brown, cord-like rhizomes, ligule <1 mm, bane of gardeners	
	Twitch, couch, *Elymus repens* = *Agropyron repens*. U. Fertile soil AB.	
	Tufted perennials, 100-150 cm tall, often forming tussocks	
	Meadow fescue *Festuca pratensis*, tall fescue *F. arundinacea*. U. Fertile soil AB (*F. arundinacea* can be dominant on brackish soils, for example industrial waste)	
9	Soft, very hairy leaves, tufted, pink veins ('stripy pyjamas') on lower leaf sheaths	
	Yorkshire-fog *Holcus lanatus*. UM. Damp soil D if dominant.	
	(Soft-grass *Holcus mollis*, is very similar, but is rhizomatous, patch-forming and has a ring of hairs at each joint on the stem. Mostly in shade or on acid, sandy soils)	
	Not as above	10
10	Leaves closely and conspicuously ribbed above	11
	Leaves not ribbed	13
11	Large (60-200 cm tall), forming dense patches, ligule <16 mm long	
	Reed canary-grass *Phalaris arundinacea*. U. Damp or wet soil, D.	
	20-60 cm tall, tufted, with very stiff, rough leaves	
	Tufted hair-grass *Deschampsia cespitosa*. U. Damp soil D	
	Neither of these, smaller species with rhizomes/stolons	
	Bents	12
12	Another difficult group, for soil types differentiate between:-	
	Very obvious stolons (no rhizomes), ligule longer than wide (2-6 mm long)	
	Creeping bent *Agrostis stolonifera*, velvet bent *A. canina* ssp. *canina*, marsh foxtail *Alopecurus geniculatus*. All UM. Damp or wet soil D.	
	No stolons, rhizomes present, ligule either very short (<2 mm)	
	Common bent *Agrostis capillaris* = *A. tenuis*	
	or ligule longer with a jagged, frayed end	

Brown bent *A. canina* ssp. *montana*, highland bent *A. castellana*. Both UM. Most soil types but dominant on infertile, acid ones E.

13

Leaves aromatic when bruised (new-mown hay), bearded with spreading hairs at junction of sheath and blade

Sweet vernal-grass *Anthoxanthum odoratum*. UM. Most infertile soils

Not as above [14]

14

Base of shoot swollen to form a small 'bulb' [15]

Not as above [16]

15

Large (40-150 cm), erect, tussock-forming species with wide (3-9 mm) leaves, blunt ligule.

Timothy *Phleum pratense* or onion couch *Arrhenatherum elatius* var *bulbosum**. U. Fertile soil, AB.

Small (10-50 cm), erect or prostrate, narrower leaves (2- 5 mm), pointed ligule

Small-leaved timothy, cat's-tail *Phleum bertelonii*. UM. Damp/wet soil D.

16

Large (60-200 cm), rhizomatous, patch-forming species, lower nodes not yellow, ligule 3-16 mm

Reed canary-grass *Phalaris arundinacea**. U. Damp soil D.

Large, tussock-forming species (no rhizomes) [17]

17

Large (50-200 cm), tussock-forming species, lower nodes and roots yellowish, ligule 1-3 mm.

False oat-grass *Arrhenatherum elatius**. U. Fertile soil AB.

Slightly smaller (30-120 cm), tufted species, basal sheaths purple/deep brown

Meadow foxtail *Alopecurus pratensis*. UM. Damp soils and fertile ones (ABD).

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* *Phleum pratense*, *Alopecurus pratensis*, *Arrhenatherum elatius* and sometimes *Phalaris arundinacea* can be difficult to differentiate when vegetative, but are very easy in flower - see Hubbard.

18

Auricles present, blades strongly ribbed above, smooth and glossy underneath

Rye-grass *Lolium perenne*. UM. Fertile soils ABC.

Not as above [19]

19

All shoots *very* flattened, broad (4-8 mm), succulent. Leaves with boat-shaped tips, tussock-forming. ligule 2-12 mm long

Cock's-foot *Dactylis glomerata*. UM. Fertile soil, ABC.

Not as above → 20

20

Leaves with boat-shaped tips and 'tram-lines' (2 distinct grooves one either side of the midrib, translucent if leaf is held to the light)
Poa spp. 21

(Tramlines not very obvious in *P. annua*, but flowerheads are nearly always present in this species)

Not as above → 23

21

Annuals (flower heads usually present), young leaves usually transversely wrinkled, no stolons/rhizomes, ligule 1-5 mm.
Annual meadow-grass *Poa annua*. UM. Most soils but common on bare patches in mown grasslands.

Perennials, not as above → 22

22

Ligule short (1-3 mm), leaf sheaths smooth
Smooth meadow-grass *Poa pratensis*

ligule long (4-10 mm), pointed. Leaf sheaths rough
Rough meadow-grass *Poa trivialis*.

Both UM. Fertile soils ABC.

23

Leaf sheaths with cross-veins and air cavities between the main veins. Patch-formers. Either large (90-250 cm), erect = reed sweet-grass *Glyceria maxima* or smaller (<1m), semi-prostrate = flote-grasses *G. declinata, G. plicata, G. aquatica*. U. Wet soil, D.

Not as above → Consult Hubbard.

Appendix 4

Glossary

Bioassay Assessing the fertility of a soil by the amount of plant growth it will support. Usually done by sowing a single species (for example, rye-grass) on pots of the soil(s) in question and a standard comparison such as potting compost. The plants are harvested, dried and weighed after a few months growth.

Calcareous Soils containing a large amount of calcium carbonate, usually as chalk or limestone. pH always >7.5.

Calcicole Plants that will only flourish on calcareous soils

Calcifuge Plants that dislike calcium carbonate and will only flourish on soils with a low level of that mineral. Such soils are almost always acidic.

Domin Recording system for vegetation surveys, used to assess the cover of each species according to the following scale;

Domin	% cover
10	100
9	75-99
8	50-74
7	33-49
6	25-32
5	10-24
4	4- 9
3	frequent, cover small
2	occasional, cover small
1	rare, cover insignificant

Green manure The practice of adding organic matter and nutrients to a soil by growing a cheap, fast-growing crop, such as mustard or *Phacelia*, which is ploughed-in before maturity. Legumes are often used by farmers but their persistent seeds could become weeds in a subsequent wild flower grassland. A small application of nitrogen may be needed at ploughing-in to help breakdown of the organic matter.

Growth retardants Chemicals intended to restrict plant growth. They seem to have more effect on grasses than on broad-leaved plants, but their degree of effectiveness depends somewhat on correct application. Intended for use in conjunction with mowing, to reduce the number of cuts needed.

Hemi-parasitic Plants which derive some of their sustenance from another plant, but also possess green leaves and make some food themselves.

Leaching The removal of plant nutrients from the soil by percolating water. The physical and chemical nature of a soil influence the rate of leaching.

Meadow Traditionally, a grassland allowed to grow long in spring and summer, then cut for hay. Usually the area was also grazed for some other portion of the year. We have not referred to new grasslands by this term to avoid confusion with the few remaining traditional meadows, which are of supreme conservation value.

Microclimate The climatic conditions very close to the object of interest: in the case of seeds, the conditions of moisture, temperature, wind, etc. at the soil surface.

PFA Pulverised Fuel Ash. The waste from coal-burning power stations where coal is burnt as a powder.

Seed bank The accumulation of viable seeds in the soil, which are likely to germinate if the soil is disturbed. Most of the bank lies in the top few cms.

Soil profile A small pit dug in a soil to show the soil layers.

Vernalisation The effect of cold weather on seeds, needed by some species to break dormancy. Can be simulated by mixing seed with damp sand and storing in a fridge for about 6 weeks.

Units metric units are used in the form kg/ha, not kg ha^{-1}

conversion factors:

1 kg = 2.20 lb	1 lb = 0.45 kg
1 ha = 2.47 acres	1 acre = 0.40 ha
1 kg/ha = 0.89 lb/acre	1 lb/acre = 1.12 kg/ha
10 kg/ha = 1 g/m^2	1 sq.yd. = 0.84 m^2
10 g/m^2 = 0.29 oz/sq.yd.	1 m^2 = 1.2 sq.yd.
1 oz/sq.yd. = 33.7 g/m^2	1 g = 0.04 oz
	1 oz = 28.35 g

µg/g = ppm = µg/ml = mg/l = mg/kg, at least as far as the inexact science of soil chemistry is concerned!