

BOVEY TRACEY.99
AGRICULTURAL LAND CLASSIFICATION SURVEY

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AGRICULTURAL LAND CLASSIFICATION SURVEY

INTRODUCTION

1. This report presents the findings of a semi-detailed Agricultural Land Classification (ALC) survey of 151ha of land in four sites at Bovey Tracey, Devon. Field survey was based on 70 auger borings and 3 soil profile pits, and was completed in March 1999. During the survey 3 samples were analysed for particle size distribution (PSD).
2. The survey was conducted by the Resource Planning Team of FRCA Western Region on behalf of MAFF in its statutory role in the preparation of Teignbridge Local Plan.
3. Information on climate, geology and soils, and from previous ALC surveys was considered and is presented in the relevant section. The published regional ALC map (MAFF 1977), shows the sites at a reconnaissance scale as mainly Grade 3 with a strip of Grade 4 running through the centre of the larger site, although most of this is now lost to a new housing estate. The site had also been surveyed previously (ADAS 1977) and this survey shows mainly Subgrade 3b and 3c with some Subgrade 3a. However, both this previous detailed survey and the published regional reconnaissance map were based on guidelines for classification which have now been superseded, whereas the current survey uses the Revised Guidelines and Criteria for grading the quality of agricultural land (MAFF, 1988) and therefore supersedes any previous ALC survey. Current grade descriptions are summarised in Appendix I.
4. A small area adjacent to the current survey had been surveyed to the revised guidelines (Southbrook Lane, Bovey Tracey, ADAS 1993) and this found Subgrade 3b limited by wetness. This was found to be similar to the current survey in that area.
5. At the time of survey land cover was mainly grass for mixed grazing and other land which was not surveyed was mainly residential land.

SUMMARY

6. The distribution of ALC grades is shown on the accompanying 1: 15 000 scale ALC map. The detail of information shown at this scale is appropriate to the intensity of field survey but could be misleading if enlarged or applied to small areas. Areas are summarised in the Table 1.

Table 1: Distribution of ALC grades: Bovey Tracey

Grade	Area (ha)	% Surveyed Area (81 ha)
3a	36	44
3b	15	19
4	31	37
Other land	69	
Total site area	151	

7. This shows that 44% of the area was found to be best and most versatile, Subgrade 3a limited mainly by wetness. The rest of the site was found to be Subgrade 3b and Grade 4, also limited mainly by wetness, although a small area of Grade 4 in the north of the site was limited by gradient.

CLIMATE

8. Estimates of climatic variables for this site were derived from the published agricultural climate dataset "Climatological Data for Agricultural Land Classification" (Meteorological Office, 1989) using standard interpolation procedures. Data for key points around the site are given in Table 2 below.

9. Since the ALC grade of land is determined by the most limiting factor present, overall climate is considered first because it can have an overriding influence by restricting land to a lower grade despite more favourable site and soil conditions. Parameters used for assessing overall climate are accumulated temperature, a measure of relative warmth and average annual rainfall, a measure of overall wetness. The results shown in Table 2 indicate that there is an overall climatic limitation which limits the land to Grade 2 above approximately the 80 m contour in the north of the site.

10. Climatic variables also affect the ALC grade through interactions with soil conditions. The most important interactive variables are Field Capacity Days (FCD) which are used in assessing soil wetness and potential Moisture Deficits calculated for wheat and potatoes, which are compared with the moisture available in each profile in assessing soil droughtiness limitations. These are described in later sections. A critical boundary of 225 FC Days was found to run approximately along the 90 m contour in the north of the site.

Table 2: Climatic Interpolations: Bovey Tracey

Grid Reference	SX 818779	SX 806777	SX 818792
Altitude (m)	25	50	150
Accumulated Temperature (day °C)	1580	1552	1437
Average Annual Rainfall (mm)	1053	1103	1212
Overall Climatic Grade	1	1	2
Field Capacity Days	213	221	237
Moisture deficit (mm):			
Wheat	94	88	69
Potatoes	85	77	52

RELIEF

11. Altitude ranges from 25 metres at the River Bovey south east of the town centre to 158 metres above Whitstone Farm in the north of the site. Slopes over most of the site were found to be gentle and moderate, not limiting to ALC although small areas of steeper slopes found in the north of the site were found to limit the land to Grade 4 and Subgrade 3b.

12. The meadow fields at either side of the River Bovey to the south east of the town may be subject to short term flooding and subsequent surface ponding, but this is considered unlikely to limit the land further than to the Subgrade 3a shown on the final ALC map, although it would preclude assessment as Grade 2, which otherwise would have been inferred from observation of several soil profiles in a small area around ASP 31E, 32 and 42F.

GEOLOGY AND SOILS

13. The underlying geology of the site is shown on the published geology map (IGS, 1976) as mainly Carboniferous Shales in the north of the sites, undifferentiated Blatchford Sands in the south and alluvium mainly in the central floodplain. This was largely borne out by the current ALC survey, although all three types were found to exhibit considerable variation and there was found to be less distinction between the three types than may have been expected. Also, the area of alluvium in the north of the western site was found to be more extensive than indicated on the published map with wet clay and peaty deposits which would not be typical of the Blatchford Sands.

14. Soils were mapped by the Soil Survey of England and Wales at a reconnaissance scale of 1:250 000 (SSEW 1983) as mainly Manod association in the north of the site, Teme association on the alluvial deposits of the central site and Nercwys and Wickham 2 associations in the south of the site. More detailed soils information is given by the one inch scale survey of the Exeter and Newton Abbot area, Sheets 325 and 339 (SSEW 1972). This indicates Bridford series described as fine loamy and gravely ochreous brown soils on the shales in the north of the site, Teigngrace series described as clayey surface water clay soils over clayey Bovey Beds mainly in the western and central sites, Bovey series described as silty gleyed brown warp soils on riverine alluvium mainly in the central site and Stover series, fine loamy gleyed brown earths on the area shown by the geological map to be underlain by the Blatchford Sands. The current survey found the distribution and description of soils as described by the detailed 1972 survey to be considerably more meaningful than the small scale information indicated by the 1: 250 000 reconnaissance map. However, the description for Teme association in the reconnaissance survey does appropriately refer to the risk of flooding on the alluvial land in which this association is found.

AGRICULTURAL LAND CLASSIFICATION

15. The distribution of ALC grades found by the current survey is shown on the accompanying 1: 15 000 scale map and areas are summarised in Table 1. The detail of information shown at this scale is appropriate to the intensity of field survey but could be misleading if enlarged or applied to small areas.

Subgrade 3a

16. The area shown as Subgrade 3a in the western site was found to be mainly medium clay loam, possibly occasionally heavy clay loam, at Wetness Class I to III. This implies that borings 47 and 47E which found medium clay loam at Wetness Class I would be assessed as Grade 2 but have been included within the area shown as Subgrade 3a. Further down the slope evidence of wetness was found as gleying below 40 cm, possibly with a slowly permeable layer starting in the lower subsoil where this was penetrable to the auger. Such a

wetter profile is illustrated by Pit 3 which found medium clay loam topsoil at Wetness Class III.

17. The area of Subgrade 3a in the south of the central site was found to be somewhat variable with mainly medium clay loam topsoil, although with slight evidence of the sand derived from its parent material. Wetness class in this area was also found to be variable, ranging from Wetness Class I to Wetness Class III. Mid range conditions are illustrated by Pit 2 where PSD analysis found the topsoil to be borderline between medium clay loam and sandy silt loam at Wetness Class II with gleying evident from 51 cm but no SPL within 80 cm.

18. The area of Subgrade 3a shown either side of the River Bovey in the central site was found to be highly variable and including several soil profiles assessed as Grade 2 with medium clay loam topsoil at Wetness Class I but frequently very close to other borings which found distinct evidence of impeded drainage. The wetter profiles are illustrated by Pit 1 which found medium clay loam topsoil at Wetness Class III with SPL from 64 cm and gleying from 41 cm. This would be borderline to Subgrade 3b. Much of this area is subject to occasional flooding as described above which subsequently leads to surface ponding as shown by the patches of crop failure in the recent reseed of the large field.

Subgrade 3b

19. The areas shown as Subgrade 3b were found to be limited mainly by wetness with heavy clay loam topsoil at Wetness Class III or medium clay loam topsoil at Wetness Class IV.

20. The small area shown as Subgrade 3b in the north of the central site represents a small area with gradients of just less than 8 degrees, primarily limited by topsoil stoniness, although this was only assessed by visual observation.

Grade 4

21. The larger areas of Grade 4 were found to be limited mainly by wetness with heavy clay loam topsoil at Wetness Class IV although conditions were found to be highly variable and several borings assessed as Subgrade 3b have been included in the area shown as Grade 4.

22. The areas of Grade 4 in the north of the central site and in the eastern site were found to be limited mainly by gradient with slopes exceeding 11 degrees.

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APPENDIX I

DESCRIPTION OF GRADES AND SUBGRADES

Grade 1 - excellent quality agricultural land

Land with no or very minor limitations to agricultural use. A very wide range of agricultural and horticultural crops can be grown and commonly include top fruit, soft fruit, salad crops and winter harvested vegetables. Yields are high and less variable than on land of lower quality.

Grade 2 - very good quality agricultural land

Land with minor limitations which affect crop yield, cultivations or harvesting. A wide range of agricultural and horticultural crops can usually be grown but on some land in the grade there may be reduced flexibility due to difficulties with the production of the more demanding crops such as winter harvested vegetables and arable root crops. The level of yield is generally high but may be lower or more variable than Grade 1.

Grade 3 - good to moderate quality agricultural land

Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2.

Subgrade 3a - good quality agricultural land

Land capable of consistently producing moderate to high yields of a narrow range of arable crops, especially cereals, or moderate yields of a wide range of crops including cereals, grass, oilseed rape, potatoes, sugar beet and the less demanding horticultural crops.

Subgrade 3b - moderate quality agricultural land

Land capable of producing moderate yields of a narrow range of crops, principally cereals and grass, or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year.

Grade 4 - poor quality agricultural land

Land with severe limitations which significantly restrict the range of crops and/or level of yields. It is mainly suited to grass with occasional arable crops (eg cereals and forage crops) the yields of which are variable. In most climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land.

Grade 5 - very poor quality agricultural land

Land with very severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

Source: MAFF (1988) Agricultural Land Classification of England and Wales Revised Guidelines and Criteria for Grading the Quality of Agricultural Land, MAFF Publications, Alnwick.

APPENDIX II

DEFINITION OF SOIL WETNESS CLASSES

Soil wetness is classified according to the depth and duration of waterlogging in the soil profile.

Wetness Class I

The soil profile is not wet within 70 cm depth for more than 30 days in most years.

Wetness Class II

The soil profile is wet within 70 cm depth for 31-90 days in most years or, if there is no slowly permeable layer within 80 cm depth, it is wet within 70 cm for more than 90 days, but not wet within 40 cm depth for more than 30 days in most years.

Wetness Class III

The soil profile is wet within 70 cm depth for 91-180 days in most years or, if there is no slowly permeable layer within 80 cm depth, it is wet within 70 cm for more than 180 days, but only wet within 40 cm depth for between 31 and 90 days in most years.

Wetness Class IV

The soil profile is wet within 70 cm depth for more than 180 days but not within 40 cm depth for more than 210 days in most years or, if there is no slowly permeable layer within 80 cm depth, it is wet within 40 cm depth for 91-210 days in most years.

Wetness Class V

The soil profile is wet within 40 cm depth for 211-335 days in most years.

Wetness Class VI

The soil profile is wet within 40 cm depth for more than 335 days in most years.

Notes: The number of days specified is not necessarily a continuous period.

'In most years' is defined as more than 10 out of 20 years.

Source: Hodgson, J M (Ed) (1997) Soil Survey Field Handbook. Soil Survey Technical Monograph No 5, Silsoe.