LAND EAST OF WATNALL, NOTTINGHAMSHIRE

Agricultural Land Classification
ALC Map and Report

December 1998

Resource Planning Team
Eastern Region
FRCA Cambridge

RPT Job Number: 85/98
MAFF Reference: EL/32/00799
FRCA Job Number: ME1AN5P

AGRICULTURAL LAND CLASSIFICATION REPORT

LAND EAST OF WATNALL, NOTTINGHAMSHIRE

INTRODUCTION

1. This report presents the combined findings of Agricultural Land Classification (ALC) surveys of 119.7 ha of land located to the east of Watnall in Nottinghamshire. Most of the area was surveyed at a reconnaissance level in 1996. In 1997 several small areas along the western and southern boundaries were surveyed in detail. Finally, in 1998, additional auger borings where made within the original 1996 survey area in order to upgrade the whole survey to a detailed level.

2. The 1996 survey work was carried out by members of ADAS Statutory and the 1997 and 1998 survey work by members of the Farming and Rural Conservation Agency (FRCA). All surveys were commissioned by the Ministry of Agriculture, Fisheries and Food (MAFF). The 1996 work being in connection with the Nottingham Local Plan and the later work in connection with the Broxtowe Local Plan Review. The combined findings of these surveys, as presented in this report, supersede all previous ALC information for this land.

3. The land has been graded in accordance with the published MAFF ALC guidelines and criteria (MAFF, 1988). A description of the ALC grades and subgrades is given in Appendix I.

4. The agricultural land use at the time or the 1998 survey comprised winter cereals, oilseed rape, grassland and ploughed land. The areas mapped as 'Other Land' comprise a fuel dump in the south-west corner, two dismantled railway lines and their margins, the buildings and access tracks associated with Common Farm and Redfield House, and a small area of woodland.

SUMMARY

5. The findings of the survey are shown on the enclosed ALC map. The map has been drawn at a scale of 1:10 000; it is accurate at this scale but any enlargement would be misleading.

6. The area and proportions of the ALC grades and subgrades on the surveyed land are summarised in Table 1, (see page 2).

7. Overall the fieldwork was conducted at an average density of 1 auger boring per hectare. A total of 106 auger borings and five soil pits was described. Additional pit information was obtained from a pit dug on an adjacent site (surveyed in 1996) located to the immediate east of the M1 motorway.

Table 1: Area of grades and other land

Grade/Other land	Area (hectares)	% surveyed area	% site area
2	66.1	63	55
3a	36.1	35	30
3b	2.0	2	2
Other land	15.5	N/A	13
Total surveyed area	104.2	100	87
Total site area	119.7	-	100

8. Much of the land on site, corresponding to the centre, west, north-east and around Redfield House (in the south) has been graded 2 (very good quality agricultural land). Most of this land is restricted by minor droughtiness constraints. In the north-west, where the altitude exceeds 120 m AOD, a climate limitation restricts the land to grade 2, either in its own right, or as an equal limitation with droughtiness. Land graded 3a (good quality agricultural land) occurs in two large areas, located east of centre in the northern and southern halves of the site, and in a small area in the west. This land is mostly restricted by moderate droughtiness constraints but occasionally limited by moderate wetness and workability imperfections. Land of subgrade 3b (moderate quality agricultural land) is confined to a small area in the south-east. Here the land quality is limited by significant wetness and workability constraints.

FACTORS INFLUENCING ALC GRADE

Climate

9. Climate affects the grading of land through the assessment of an overall climatic limitation and also through interactions with soil characteristics.

10. The key climatic variables used for grading this site are given in Table 2 and were obtained from the published 5 km grid datasets using the standard interpolation procedures (Met. Office, 1989).

Table 2: Climatic and altitude data

Factor	Units	Values	
Grid reference	N/A	SK 508 457	SK 503 462
Altitude	m, AOD	110	121
Accumulated Temperature	day°C (Jan-June)	1327	1314
Average Annual Rainfall	mm	691	699
Field Capacity Days	days	157	158
Moisture Deficit, Wheat	mm	96	94
Moisture Deficit, Potatoes	mm	85	82
Overall climatic grade	N/A	Grade 1	Grade 2

11. The climatic criteria are considered first when classifying land as climate can be overriding in the sense that severe limitations will restrict land to low grades irrespective of favourable site or soil conditions.

12. The main parameters used in the assessment of an overall climatic limitation are average annual rainfall (AAR), as a measure of overall wetness, and accumulated temperature (AT0, January to June), as a measure of the relative warmth of a locality.

13. Most of the site is of climatic grade 1, however a climatic boundary between grade 1 and 2 occurs in the north-west. The boundary lies at approximately 120 m AOD. Land above this altitude cannot be graded higher than grade 2, whilst below this altitude there is no climatic limitation to the agricultural land.

Site

14. The site adjoins Watnall to the west and New Nuthall to the south. The east of the site is bounded by the M1 motorway and the north by Long Lane (B6009). The site forms part of a gently undulating plateau which slopes in a generally south-easterly direction from 125 m AOD in the north-west corner to 90 m AOD in the south-east corner. The land is either flat of gently sloping, with gradients not exceeding 3° anywhere on site. The site therefore suffers no limitation due to gradient.

Geology and soils

15. The published 1:50 000 scale solid and drift edition geology map, sheet 125, Derby (Geological Survey of Great Britain [England and Wales]1972) maps the site as Permo-Triassic Lower Magnesian Limestone.

16. At a reconnaissance scale of 1:250 000 the Soil Survey of England and Wales, (Sheet 3, Soils of Midland and Western England, 1983) maps the entire site as the Aberford Association, which is briefly described as: Shallow locally brashy, well drained calcareous fine loamy soils over limestone. Some deeper calcareous soils in colluvium.

17. The current survey identified the presence of 3 soil types.

18. The first soil type occurs throughout the site, but tends to be more dominant in the west, centre and north. Topsoils comprise medium clay loams, sandy clay loams or occasionally medium sandy loams. They are non-calcareous, very slightly stony and 30/35 cm deep. Upper subsoils typically comprise medium clay loams, but also include medium sandy loams, heavy clay loams and sandy clay loams. They are non-calcareous, very slightly stony and typically extend to 50/80 cm depth. Lower subsoils typically comprise non-calcareous loamy medium sands often merging into medium sand, they are typically very stony (containing weathered limestone rubble) and become impenetrable to auger at depth.

19. The second soil type also occurs throughout the site, tending to be more prominent in two large areas east of centre in the north and south of the site. Topsoils typically comprise very slightly stony, non-calcareous medium clay loams or sandy clay loams (occasionally medium sandy loams) and extend to 25/35 cm depth. Beneath the topsoil a thin upper subsoil occurs in the majority of profiles. This upper subsoil is typically non-calcareous and of

medium sandy loam (occasionally medium clay loam or sandy clay loam) texture, it is very slightly stony and merges into the lower subsoil at 40/50 cm depth. The lower subsoil consists of a typically non-calcareous, moderately stony loamy medium sand. This horizon becomes impenetrable to auger at 50/70 cm depth. Pit information confirms that below this depth the lower subsoil becomes very stony to extremely stony, comprising weathered limestone.

20. The third soil type occurs sporadically throughout the site. Topsoils are non-calcareous, very slightly stony and 30/35 cm deep. Their texture is typically medium clay loam or sandy clay loam. The topsoil either directly overlies slowly permeable red clay or is separated from it by a thin upper subsoil. Where an upper subsoil occurs, it comprises heavy clay loam or medium clay loam, is non-calcareous, stoneless and extends to 40/55 cm depth where it merges into the clay. In most profiles limestone rubble, typically only augerable for a short distance, is encountered at depth. These profiles have typically been assessed as imperfectly drained.

AGRICULTURAL LAND CLASSIFICATION

21 The details of the classification of the site are shown on the attached ALC map and the area statistics of each grade are given in Table 1, page 1.

22. The location of the auger borings and pits is shown on the attached sample location map.

Grade 2

23. Land graded 2 typically corresponds with the soils described in paragraph 18. The combination of soil textures and stone contents mean the soil has a slightly limited ability to retain water for crop growth. It therefore suffers a minor droughtiness constraint which precludes it from a higher grade. On the land in the north-west where the altitude rises to over 120 m AOD climate is limiting to grade 2, either in its own right or as an equal limitation with the minor droughtiness constraint.

Subgrade 3a

24. Land of subgrade 3a occurs in two situations. Firstly it corresponds with soils described in paragraph 19. Subsoils typically become very stony at moderate depth. This factor combines with the textures and stone contents of the upper horizons to limit the soils ability to retain water for crop growth. The land is therefore subject to a moderate droughtiness imperfection which precludes it from a higher grade. Within the areas mapped as subgrade 3a some better and poorer profiles occur. These can not however be dilineated separately at the scale of this survey.

25. Secondly, land of subgrade 3a corresponds with the soils described in paragraph 20. Within this soil type the fine loamy topsoils combine with the slowly permeable clayey subsoil horizons at moderate depth (Wetness Class III) to impose a moderate wetness and workability constraint, thus restricting the land to subgrade 3a.

Subgrade 3b

26. The subgrade 3b land on site is confined to a small area in the south-east. This area corresponds with the soils described in paragraph 20. Fine loamy topsoils directly overlie slowly permeable clay subsoils (assessed as Wetness Class IV). This combination imposes a significant wetness and workability imperfection and thus precludes the land from a higher grade.

Adrian Rochford
Resource Planning Team
Eastern Region
FRCA Cambridge

SOURCES OF REFERENCE

Geological Survey of Great Britain (England and Wales), 1972, *sheet 125, Derby.* 1:50 000 scale. BGS: London.

Ministry of Agriculture, Fisheries and Food (1988) *Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land.* MAFF: London.

Met. Office (1989) *Climatological Data for Agricultural Land Classification.* Met. Office: Bracknell.

Soil Survey of England and Wales (1983) *Sheet 3, Soils of Midland and Western England.* SSEW: Harpenden.

Soil Survey of England and Wales (1984) *Soils and their Use in Midland and Western England* SSEW: Harpenden

APPENDIX I

DESCRIPTIONS OF THE 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 includes 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 or horticultural crops can usually be grown but on some land of this 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 land.

Grade 3: Good to Moderate Quality Land

Land with moderate limitations which affect the choice of crops, the timing and type of cultivation, harvesting or the level of yield. When 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 the level of yields. It is mainly suited to grass with occasional arable crops (e.g. cereals and forage crops) the yields of which are variable. In moist 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 severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.