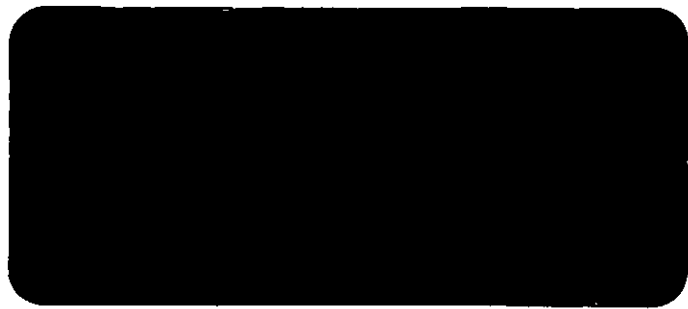


**ADAS
LAND
MANAGEMENT
SERVICES**



A D A S



Agricultural Land Classification

**Land at Bedford Road,
Wootton, Bedfordshire.**

AGRICULTURAL LAND CLASSIFICATION

LAND AT BEDFORD RD, WOOTTON, BEDFORDSHIRE

1. INTRODUCTION

- 1.1 A detailed Agricultural Land Classification (ALC) of this 5.4 hectare site was made during July 1989.
- 1.2 The Agricultural Land Classification provides a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use. The limitations can operate in one or more of four principal ways: they may affect the range of crops which can be grown, the level of yield, the consistency of yield and the cost of obtaining it. The classification system gives considerable weight to flexibility of cropping, whether actual or potential, but the ability of some land to produce consistently high yields of a somewhat narrower range of crops is also taken into account.
- 1.3 The principal physical factors influencing agricultural production are climate, site and soil. The main climatic factors which are taken into account are temperature and rainfall, although account is also taken of exposure, aspect and frost risk. The site factors used in the classification system are gradient, micro relief and flood risk. Soil characteristics of particular importance are texture, structure, depth and stoniness. In some situations chemical properties may also influence the long term potential of land and are taken into account.
- 1.4 These factors result in varying degrees of constraint on agricultural production. They can act either separately or in combination, the most important interactive limitations being soil wetness and droughtiness. The grade or subgrade of land is determined by the most limiting factor present. Five grades of land are recognised ranging from Grade 1 land of excellent quality to Grade 5 land of very poor quality. Grade 3, which constitutes about half of the agricultural land in England and Wales is divided into two subgrades designated 3a and 3b.

1.5 Details of the Agricultural Land Classification (ALC) System are contained in MAFF's Technical Report "Revised guidelines and criteria for grading the quality of agricultural land". Description of the ALC grades and subgrades are provided in Appendix 1.

2. BACKGROUND TO THE SITE

2.1 On the Ministry's published 1:63360 scale provisional ALC map (Sheet No.147) (MAFF, 1969) the site is mapped as grade 3. For detailed site-specific appraisals however, these maps are inappropriate as they were initially surveyed at a reconnaissance level, for strategic planning purposes, and often do not show smaller areas (ie less than 80 hectares) of individual ALC grades.

2.2 The site comprises two main enclosures. Typical cropping includes cereals, oilseed rape, winter beans and grass.

2.3 A total of 14 soil inspections were made over the site using a hand held 125 cm Dutch soil auger. These inspections were supplemented by observations from 2 soil pits.

3. PHYSICAL FACTORS AFFECTING LAND QUALITY

Climate

3.1 Site specific climate data has been obtained by interpolating information contained in the 5 km grid dataset produced by the Meteorological Office, (Met Office, 1989).

3.2 The annual average rainfall is approximately 579 mm (22.8") which is low by national standards. Soils are likely to be at field capacity for a relatively short period of approximately 104 days. During this time the workability of the land may be impaired because of the relatively slow permeability of the clay subsoil.

3.3 The accumulated temperature for this area is approximately 1445 degrees celsius. This parameter indicates the cumulative build-up of warmth available for crop growth, and has an influence on the

development of soil moisture deficits (SMD)* and susceptibility to drought; the soil moisture deficits for potatoes and wheat are 115 mm and 119 mm respectively.

- 3.4 The site is neither particularly exposed or frost prone.
- 3.5 The climatic characteristics described at paragraphs 3.2 to 3.4 above do not impose any climatic limitation on the ALC grading of the survey site.

Altitude and Relief

- 3.6 The land lies fairly level across the site, at an altitude of 35 m AOD. Gradient and altitude do not constitute limitations to the ALC grade.

Geology and Soils

- 3.7 The published small scale (1:250,000) geology map sheet 52 (Institute of Geological Sciences, 1983) shows the site to comprise Oxford Clay. (Jurassic Period).
- 3.8 The Soil Survey of England and Wales have mapped the soils in the Wootton area on two occasions; In 1965 at 1:63360 scale and more recently, in 1983, at a reconnaissance scale of 1:250,000. These maps show the occurrence of soils derived from Jurassic and/or Cretaceous Clays, namely the Rowsham (*1) and Evesham 3(*2) Associations

* SMD represents the balance between rainfall and potential evapotranspiration occurring during the growing season. For ALC purposes the soil moisture deficits developing under a winter wheat and maincrop potato cover are considered. These 'reference' crops have been selected because they are widely grown, and in terms of their susceptibility to drought, are representative of a wide range of crops.

(*1) Rowsham Association: Non calcareous gley soil

(*2) Evesham 3 Association: Slowly permeable calcareous clayey, and fine loamy over clayey soils. Some slowly permeable seasonally waterlogged non-calcareous clayey soils.

respectively. During this survey a more detailed inspection of the soils was carried out. Two main soil types occur over the site.

- 3.8.1 The majority of the site is covered by soils which typically comprise very slightly stony clay topsoils over gleyed, very slightly stony clay subsoils. Soil profiles are generally non calcareous in the upper horizons and often become calcareous at depth (c 60-70 cm+) where calcium carbonate fragments are present. Stones comprise small subangular flints.
- 3.8.2 Randomly interspersed with the soils described in paragraph 3.8.1 above the following stonier soils occur. They typically comprise very slightly or slightly stony clay topsoils over slightly stony, gleyed clay subsoils. At the time of the survey it was not possible to auger these soils to 120 cm, however pit data confirmed that these soils are likely to be slightly stony clays to 120 cm. These soils are calcareous in the lower horizons where calcium carbonate fragments occur. The stones comprise very small and small subangular flints.
- 3.8.3 Soil profile pit observations indicate that soils are moderately droughty and poorly drained (ie wetness Class III*).

4. AGRICULTURAL LAND CLASSIFICATION (refer to Map 1)

- 4.1 A breakdown of the ALC grades in hectares and % terms is provided below.

Agricultural Land Classification

Grade	ha	%
3b	5.4	100

* At a few locations the wetness class was assessed as wetness Class II, however these soils cover too small an area to delineate separately.

4.2 Subgrade 3b

Soils on the site are heavy textured with slowly permeable subsoils (Wetness Class 111). Even in such a relatively dry area this combination of heavy topsoil and impeded drainage imposes a significant limitation on their agricultural potential, especially for arable cropping. As a result, the land is graded 3b (moderate quality agricultural land).

July 1989

Resource Planning Group
Cambridge RO

Appendix 1

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 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. 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 3a - 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 crop.

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.

References

INSTITUTE OF GEOLOGICAL SCIENCES 1983 Solid Geology Map No.52. 1:250,000.

MAFF, 1969. Agricultural Land Classification Map Sheet 147
1:63360.

MAFF, 1988. Agricultural Land Classification of England and
Wales. (Revised guidelines and criteria for
grading the quality of agricultural land)
Alnwick.

METEOROLOGICAL OFFICE, 1989. Published rainfall data extracted from ALC
agroclimatic dataset, computed by
Meteorological Office.

SOIL SURVEY OF ENGLAND AND WALES 1965
Bedford and Luton 1:63360.

SOIL SURVEY OF ENGLAND AND WALES 1983.
'The Soils of Eastern England' Sheet 4
1:250,000 scale.

BEDFORD ROAD, WOOTTON, BEDFORDSHIRE

DESCRIPTION OF AUGER BORINGS

1. Fairly level upper plateau, Grass
 - 0-30cm 10yr 3/2 mc
v. sli calc, v. sli stony
 - 30-40cm 10yr 5/3 mc, com och streaks
v. sli stony and v. sli calc.
 - 40-60cm 5y 5/3 mc
com dist och streaks - 10yr 5/6
v. sli calc, v. sli stony
few CaCO₃ frag 55+
 - 60-120cm+ calc 2.5y 6/2 mc,
com dist och mot 10yr 5/6 .

2. Fairly level upper plateau, Grass
 - 0-30cm 10yr 3/2 mc
many root mot 5yr 4/6
v. sli calc and v. sli stony
 - 30-60cm 10yr 5/3 mc, v. sli calc,
com och (10 yr 5/6) and gr
mot (10yr 5/2); sli stony
 - 60-120cm 2.5y 6/2 mc, com
dist och mot 10yr 5/6
calc, v. sli stony
many CaCO₃ frag 70cm+

3. Fairly level upper plateau, Winter Wheat
 - 0-30cm 10yr 3/2 mc
v. sli calc, v. sli
stony
 - 30-60cm 10yr 5/3 mc, v. sli
stony, few och streaks
10yr 5/6 bec com 40+,
com dist gr 45+ 5y 5/2
few CaCO₃ frag
 - 60-120cm+ 2.5y 6/2³mc, com CaCO₃
frag, calc, many dist
och streaks, v. sli stony

Fairly level upper plateau, Winter Wheat

4.
 - 0-30cm 10yr 3/2 mc,
v. sli stony
 - 30-80cm 10yr 5/3 mc, com
och streaks 10yr 5/6
v. sli stony, v. sli calc,
bec sli stony and com
gr mot 60cm+ (10yr 5/2)
 - 80cm+ Impenetrable stones

5. Fairly level upper plateau, Winter Wheat

0-30cm 10yr 3/2 mc/HCL
v. sli stony and
v. sli calc
30-45cm 10yr 5/3 mc
v. sli calc, v. sli stony
com och mot 10yr 5/6
45-120cm+ 10yr 5/3 mc, many dist
och (10yr 5/6) and gr
mot (10yr 5/1), v. sli stony
and v. sli calc, bec calc
and greyer 60cm+

6. Fairly level upper plateau, Grass

0-30cm 10yr 3/2 mc
v. sli calc and v. sli stony
Lime?
35-45cm 10yr 5/3 mc, v. sli calc
com dist och mot 10yr 5/6
v. sli stony
45-120cm+ 5y 5/3 mc, calc,
com CaCO₃ frag, com
dist och mot 10 yr 5/6.

7. Fairly level upper plateau, Grass

0-25cm 10yr 3/2 mc
non calc, v. sli stony
25-55cm 10yr 5/3 v. sli calc mc,
com dist och mot 10yr 5/6
v. sli stony, bec calc 40cm+
55-120cm+ 2.5y 6/2 mc, many CaCO₃
frag, calc, com dist och
streaks 10yr 5/6

8. Fairly level upper plateau, Winter Wheat

0-30cm 10yr 3/2 mc, v. sli calc,
v. sli stony
30-55cm 10yr 5/3 mc, v. sli calc,
com dist och mot 10yr 5/6
sli stony
55-60cm+ 2.5y 6/2 mc, calc
com dist och mot 10yr 5/6
sli stony
60cm+ Impenetrable stones

9. Fairly level upper plateau, Winter Wheat

0-30cm 10yr 3/2 mc, v. sli calc
v. sli - sli stony
30-50cm 10yr 5/3 mc, v. sli calc
com och st 35cm+ - 10yr 5/6,
v. sli stony, com gr mot 45cm+
50-120cm+ 2.5y 6/2 mc, v. sli stony,
calc, com dist och mot -
10 yr 5/6.

10. Fairly level upper plateau, Grass
- | | |
|----------|--|
| 0-30cm | 10yr 3/2 mc, v. sli. stony, v. sli calc |
| 30-90cm | 10yr 5/3 mc, many dist
och mot 10yr 5/6. v. sli
stony, v. sli calc, com
gr mot 50cm+ - 2.5y 5/2 |
| 90-120cm | 2.5y 6/2 mc, calc
v. sli stony, many dist och mot - 10yr 5/6 |
11. Fairly level upper plateau, Winter Wheat
- | | |
|---------|---|
| 0-30cm | 10yr 3/2 v. sli - sli stony
v. sli calc |
| 30-60cm | 10 yr 5/3 mc
v. sli calc, sli stony
com dist och mot 10yr 5/6 |
| 60cm+ | Impenetrable stones |
12. Fairly level upper plateau; Winter Wheat
- | | |
|--------|---|
| 0-30 | 10yr 3/2 mc
v. sli calc, sli stony |
| 30-50 | 2.5y 6/4 mc, v. sli calc,
com och mot 10yr 5/6,
sli stony; och mot more
dist and gr mot too 45cm+ - 10yr 5/1 |
| 50-120 | 2.5y 6/2 mc
com och mot 10yr 5/6
sli calc, v. sli stony |
13. Fairly level upper plateau, Winter Wheat
- | | |
|----------|---|
| 0-30cm | 10yr 3/2 mc, v. sli calc
v. sli - sli stony |
| 30-60cm | 10yr 5/3 mc, few och st
bec com and dist 40cm+,
calc 40cm+, sli stony |
| 60-120cm | 2.5y 6/2 mc, calc
com CaCO ₃ frag, v. sli
stony |
14. Fairly level upper, plateau, Winter Wheat
- | | |
|-------|---|
| 0-25 | 10yr 3/2 mc
very sli calc
sli stony |
| 25-80 | 10yr 5/3 mc
v. sli calc
nms, sli stony
com och mot 35+ - 10yr 5/6
and few gr 10yr 5/2 |
| 80cm+ | Impenetrable stones |

LIST OF ABBREVIATIONS USED:

mc	medium clay
HCL	heavy clay loam
calc	calcareous
bec	becoming
com	common
dist	distinct
v. sli.	very slightly
sli	slightly
mod.	moderately
v	very
frag	fragments
mot	mottles
gr	grey
och	ochreous
nms	no mottles seen

Stone Content

Very slightly stony : 1-5%
Slightly stony : 6-15%