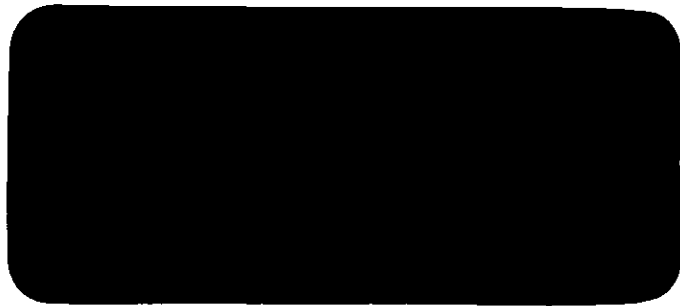




LAND
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AGRICULTURAL DEVELOPMENT AND ADVISORY SERVICE

Agricultural Land Classification
Home Farm, Silsoe,
Beds

AGRICULTURAL LAND CLASSIFICATION

HOME FARM, SILSOE, BEDFORDSHIRE

1. INTRODUCTION

1.1 A detailed Agricultural Land Classification (ALC) of this 83.3 hectare site was made during February 1990.

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". Descriptions 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 mainly grade 3 with a small area of 2 to the north. 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 five large enclosures. At the time of the survey the majority of the land was in arable use with two fields of grass adjacent to Beans Close Lodge. Arable crops typically include winter beans and oil seed rape.
- 2.3 A total of 90 soil inspections were made over the site using a hand held 120 cm dutch soil auger. These inspections were supplemented by observations from four soil pits.

3. PHYSICAL FACTORS AFFECTING LAND QUALITY

Climate

- 3.1 Site specific climatic data has been obtained by interpolating information contained in the 5 km grid dataset produced by the Meteorological Office, (Met Office, 1989).
- 3.2 This dataset indicates that for the site's mid range altitude (65m AOD) the annual average rainfall is 585 mm (23"). This also

indicates that soils are likely to be at field capacity for 107 days. During this time the workability of this fine textured land may be impaired because of the relatively slow permeability of these soils.

- 3.3 The accumulated temperature for this area is approximately 1412 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 110 mm and 116 mm respectively.
- 3.4 The site is neither particularly exposed nor frost prone.
- 3.5 The climatic characteristics described in paragraphs 3.2 - 3.4 above do not impose any climatic limitation to the ALC grading of the survey area.

Altitude and Relief

- 3.6 The land slopes gently over the majority of the site ranging in altitude from 60m to 70m AOD. Towards the south east corner of the site the land rises steeply from 60m to 75m AOD. Slopes were measured using a Suunto clinometer and were found to range from 5 - 7.5°. Within this small area, where slopes exceed 7°, a gradient limitation restricts the land to subgrade 3b. However over the remainder of the site gradient and altitude do not constitute limitations to the ALC grade.

Geology and Soil

- 3.7 The published small scale (1:250,000) geology map sheet 52 (Institute of Geological Sciences, 1983) shows the survey area to comprise a bedrock of Lower Cretaceous Sandstone.

* 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.

3.8 The Soil Survey of England and Wales have mapped the soils in the Silsoe area on two occasions; firstly in 1965 at 1:63360 scale and more recently in 1983, at a reconnaissance scale of 1:250,000. The former map shows the occurrence of mainly the Wicken Association (*1) with smaller areas of Cottenham (*2) and Oak (*3) Associations; whilst the latter maps the occurrence of the Evesham 3 Association (*4). During the current survey a more detailed inspection of the soils was carried out. Three main soil types occur over the site.

3.8.1 The majority of the site is covered by decalcified soils which typically comprise heavy clay loam or clay topsoils over clay subsoils which may become calcareous at depth.

3.8.2 At the southern end of the site, adjacent to Wrest Park, calcareous variants of the soils described in paragraph 3.8.1 occur. These soils are typically clayey throughout and often contain calcium carbonate nodules at depth in the profiles.

3.8.3 Finally, in small pockets across the site fine loamy soils predominate. These soils are decalcified and typically comprise heavy clay loam or occasionally sandy clay loam topsoils over heavy clay loam subsoils which typically overlies clays or clay loams with common pockets of sand. Occasionally, at depth soils may comprise medium sandy loams and/or loamy medium sands.

(*1) Wicken Association: Calcareous gley soil; Gault parent material.

(*2) Cottenham Association: Brown earth; Lower Greensand parent material.

(*3) Oak Association: Non calcareous gley soil; London Clay parent material.

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

4. AGRICULTURAL LAND CLASSIFICATION. (refer to ALC map)

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

Grade	Agricultural Land Classification	
	ha	%
3a	25.7	30.9
3b	56.3	67.6
Non Agricultural	1.2	1.4
Urban	0.1	0.1
	—	—
Total	83.3	100
	—	—

4.2 Subgrade 3a

Approximately a quarter of the survey area has been mapped as subgrade 3a.

4.2.1 In the vicinity of Beans Close Lodge and Broadlands Spinney the land is associated with the soils described in paragraphs 3.8.1 and 3.8.3. Soil profile pit observations indicate that these soils have slowly permeable horizons ** present at depth in the subsoil (ie wetness class II). Topsoil textures are heavy and non calcareous. These factors combine to impose a moderate limitation on the agricultural potential of this land. Thus the land is excluded from grade 2.

4.2.2 At the southern edge of the site adjacent to Wrest Park the land is associated with the calcareous soils described in paragraph 3.8.2. The subsoils are slowly permeable (wetness class III) and the topsoil textures are calcareous and heavy (eg clays); these factors combine to impose a moderate limitation on the agricultural potential of this land. As a result the land is restricted to subgrade 3a (good quality agricultural land).

** Occasionally slightly droughty freely draining grade 2 profiles occur within this subgrade 3a land. However these areas are too small to delineate at this survey scale.

4.3 Subgrade 3b

The majority of the survey area has been graded 3b. This land comprises the central block of the site and a small area south of Pateman's Wood.

4.3.1 Firstly, the central block of land comprises decalcified clayey soils described in full in paragraph 3.8.1 above. Soil profile pit observations indicate that these soils are slowly permeable throughout the subsoil. (35cm+, ie wetness class III). The combination of heavy decalcified topsoils and impeded subsoil drainage restrict this land to subgrade 3b.

4.3.2 On the steep slopes south of Pateman's Wood lighter textured, freely draining soils occur. The coarse soil textures have a moderate limiting effect on the available water capacity of these soil profiles. However it is the steep gradient limitation which excludes this land from a higher grade.

4.4 Non Agricultural

A pond and woodland have been mapped as Non Agricultural.

4.5 Urban

Brabury Lodges have been mapped as urban.

Resource Planning Group
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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. 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 droughtly 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.

References

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

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1:63360.

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Wales. (Revised guidelines and criteria for
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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.