

AGRICULTURAL LAND CLASSIFICATION

LAND AT HARDWICK FARM SOUTHAM ROAD BANBURY



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1 BACKGROUND

- 1 1 40 17 ha of land was surveyed at Hardwick Farm Banbury in connection with proposals for a drinks canning factory This area comprises the planning application area (31 72 ha) together with some additional areas which could be compromised if the proposed development was to proceed 29 auger borings were made over the area with 1 1m and 1 2m dutch soil augers Additional information was obtained from two soil inspection pits
- 1 2 At the time of survey (20-21 March 1990) the majority of the land was in permanent pasture with one arable field (winter cereals) east of Hardwick Farm A deserted Medieval Village scheduled as an ancient monument, is recorded in the immediate vicinity of the farmstead and evidence for this can be found in the field immediately north of the farm buildings in the form of upstanding earthworks Ridge and furrow microtopography is also a feature of parts of the site

2 PHYSICAL FACTORS AFFECTING LAND QUALITY

Climate

- 2 1 Estimates of climatic variables were obtained by interpolation from a 5km grid database (Met Office, 1989) for a representative location in the survey area The important parameters in assessing an overall climatic limitation are average annual rainfall (a measure of overall wetness) and accumulated temperature (a measure of the relative warmth of a locality There is no overall climatic limitation affecting the site

Table 1 Climatic Interpolation

Grid Ref	SP 460430
Altitude (m)	110
Accumulated Temperature (° days)	1373
Average Annual Rainfall (mm)	690
Field Capacity Days	158
Moisture Deficit wheat (mm)	102
Moisture Deficit, potatoes (mm)	91

Relief

- 2 2 The site lie at altitudes between 95m and 120m AOD with overall falls in an easterly or southerly direction towards the Cherwell Valley Gradient is not a factor influencing land quality on the site although some steeper slopes of 5-7° do occur on valley sides east and west of the main farm buildings These are however, within the set criteria and no downgrading occurs
- 2 3 As indicated in para 1 2 parts of the site show evidence of either ridge and furrow microtopography or upstanding earthworks indicative of the medieval village site The majority of these features place no long term limitation on the agricultural use of land and hence are not an influencing factor with regard to the ALC assessment on the site However, the area denoted as the medieval village site immediately north of Hardwick farm buildings has more a complex pattern of steep sided and irregular earthworks which would preclude mechanical operations such as ploughing It is considered that this area would be difficult to improve agriculturally without the use of specialised earthmoving machinery Consequently, irrespective of the designation as a scheduled ancient monument the land will have a long term limitation due to the microtopography which is likely to preclude normal arable cropping This land is therefore designated as Grade 3b

Geology and Soils

- 2 4 The geology of the site is indicated on geological map sheet number 201 (Banbury) (Geol Surv Great Britain 1982) as Jurassic Middle and Lower Lias deposits. These are predominantly clays or silty clays but with some harder limestone or siltstone bands. The junction of the Middle Lias and Lower Lias is commonly marked by a line of seepage and springs (Geol Surv G B 1982). These are believed to supply the water to the fishpond/moat.
- 2 5 There is no detailed published Soil Survey Sheet covering this locality but Sheet 6 Soils of England and Wales (SE England) (SSEW, 1983) maps the Wickham 2 Association over the majority of the area. These are described as "Slowly permeable seasonally waterlogged fine loamy over clayey, fine silty over clayey and clayey soils. Small areas of slowly permeable calcareous soils on steeper slopes (SSEW 1983). A small area of the Banbury Association is also mapped. These soils are described as Well drained brashy fine and coarse loamy furriginous soils over ironstone. Some deep fine loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging" (SSEW 1983).
- 2 6 Detailed inspection of the soils on the site indicates that they are relatively uniform in nature having medium clay loam silty clay loam or silt loam topsoils typically overlying progressively heavier subsoils of heavy clay loam or silty clay loam usually passing to clay or silty clay from 50-60cm+. Gleying occurs at variable depths in the subsoils but is typically apparent by 50-60cm. These soils are commonly wetness Class III due to a slowly permeable lower subsoil but may also be allocated to wetness Class II where soils are more permeable, or wetness Class IV where slowly permeable horizons are higher in the soil profile. Consequently the majority of land on the site is limited by wetness/workability constraints.

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3 1 The majority of the survey area has been Graded 3a with smaller areas of Grades 2 and 3b. A significant area to the south of the site was not surveyed. This area is currently subject to considerable disturbance and soil moving. A further small area west of the A423 (Southam Road) was also unsurveyed. A breakdown of the area and proportion of the grades is given below for both the total area of survey and the smaller planning application area.

	<u>Application Area</u>		<u>Total area of Survey</u>	
	ha	%	ha	%
Grade 2	4 60	14 5	7 05	18 0
3a	13 24	42 0	18 64	46 0
3b	1 75	5 5	2 35	6 0
Non-Agricultural	0 65	2 0	0 65	2 0
Not Surveyed	9 83	31 0	9 83	24 0
Farm Buildings	1 65	5 0	1 65	4 0
 Total	 31 72	 100 0	 40 17	 100 0

Grade 2

3 2 Grade 2 is mapped in two locations on the site. The soils are more permeable and better drained (wetness Class II) than is typical elsewhere on the site and comprises medium clay loam/silty clay loam or silt loam topsoils typically over similar upper subsoils which may extend to depth or have an increasing clay content. Slowly permeable layers are usually absent within 60-80cm and occasional sandier textured horizons or those containing weathered ironstone fragments may be present. This land should be flexible in use and capable of a range of arable and horticultural cropping.

Grade 3a

- 3 3 Land of this quality occurs extensively over the site. Soils are of a similar type to those described for Grade 2 but are less permeable due to the presence of slowly permeable horizons of higher clay content from 50-60cm. These are allocated to wetness Class III. These soils will be subject to a slightly increased workability constraint compared with the Grade 2 areas. Nevertheless land of this quality should be capable of growing a range of arable crops and grass.

Grade 3b

- 3 4 Land mapped as 3b occurs immediately adjoining the northern boundary of the farmstead and is associated with two broad situations. The majority occurs in the area of earthworks associated with the deserted medieval village. This area is considered to have microtopographical constraints of a long term nature which could not be improved by normal farming operations. Irrespective of the legal constraints imposed by the designation as a scheduled ancient monument, heavy earthmoving machinery would be required to level out this area. This microtopographical limitation does not however extend to the majority of the ridge and furrow features elsewhere on the site as these can be (and have been) levelled by normal agricultural operations such as ploughing. Consequently it is considered that the earthworks associated with the medieval village form a sufficiently irregular surface to preclude normal arable cropping and thus a Grade 3b designation is appropriate.
- 3 5 The remaining area of 3b occurs on lower slopes to the west of the farm buildings. Although soil textures are broadly typical of the site this area is believed to suffer from water seepage possibly associated with the geological boundary between the Middle and Lower Lias deposit (see para 2 4), which in combination with gleyed horizons and slowly permeable horizons

at relatively shallow depth causes this land to be assigned to
wetness Class IV due to an increased wetness limitation

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SOURCES OF REFERENCE

GEOLOGICAL SURVEY OF GREAT BRITAIN (1982) Geological Map Sheet No
201 Banbury 1 50 000 scale Solid and Drift Edition

MAFF (1988) Agricultural Land Classification of England and Wales
Revised Guidelines and Criteria for grading the quality of agricultural
land

METEOROLOGICAL OFFICE (1989) Climatological Datasets for Agricultural
Land Classification

SOIL SURVEY ON ENGLAND AND WALES (1983) Soils map of England and
Wales Sheet 6 (South East England) 1 250,000 scale

DESCRIPTION OF THE GRADES AND SUBGRADES

The ALC grades and subgrades are described below in terms of the types of limitation which can occur typical cropping range and the expected level and consistency of yield. In practice the grades are defined by reference to physical characteristics and the grading guidance and cut offs for limitation factors in Section 3 enable land to be ranked in accordance with these general descriptions. The most productive and flexible land falls into Grades 1 and 2 and Subgrade 3a and collectively comprises about one third of the agricultural land in England and Wales. About half the land is of moderate quality in Subgrade 3b or poor quality in Grade 4. Although less significant on a national scale such land can be locally valuable to agriculture and the rural economy where poorer farmland predominates. The remainder is very poor quality land in Grade 5 which mostly occurs in the uplands.

Descriptions are also given of other land categories which may be used on ALC maps.

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 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.

Descriptions of other land categories used on ALC maps

Urban

Built up or 'hard' uses with relatively little potential for a return to agriculture including housing, industry, commerce, education, transport, religious buildings, cemeteries. Also hard surfaced sports facilities, permanent caravan sites and vacant land, all types of derelict land including mineral workings which are only likely to be reclaimed using derelict land grants.

Non agricultural

Soft uses where most of the land could be returned relatively easily to agriculture including golf courses, private parkland, public open spaces, sports fields, allotments and soft surfaced areas on airports/airfields. Also active mineral workings and refuse tips where restoration conditions to soft after uses may apply.

Woodland

Includes commercial and non commercial woodland. A distinction may be made as necessary between farm and non farm woodland.

Agricultural buildings

Includes the normal range of agricultural buildings as well as other relatively permanent structures such as glasshouses. Temporary structures (eg polythene tunnels erected for lambing) may be ignored.

Open water

Includes lakes, ponds and rivers as map scale permits.

Land not surveyed

Agricultural land which has not been surveyed.

Where the land use includes more than one of the above land cover types eg buildings in large grounds and where map scale permits the cover types may be shown separately. Otherwise, the most extensive cover type will usually be shown.

APPENDIX

FIELD ASSESSMENT OF SOIL WETNESS CLASS

SOIL WETNESS CLASSIFICATION

Soil wetness is classified according to the depth and duration of waterlogging in the soil profile. Six revised soil wetness classes (Hodgson in preparation) are identified and are defined in Table 11.

Table 11 Definition of Soil Wetness Classes

Wetness Class	Duration of Waterlogging ¹
I	The soil profile is not wet within 70 cm depth for more than 30 days in most years ²
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
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
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
V	The soil profile is wet within 40 cm depth for 211-335 days in most years
VI	The soil profile is wet within 40 cm depth for more than 335 days in most years

¹ The number of days specified is not necessarily a continuous period

² In most years is defined as more than 10 out of 20 years

Soils can be allocated to a wetness class on the basis of quantitative data recorded over a period of many years or by the interpretation of soil profile characteristics, site and climatic factors. Adequate quantitative data will rarely be available for ALC surveys and therefore the interpretative method of field assessment is used to identify soil wetness class in the field. The method adopted here is common to ADAS and the SSLRC.