

AGRICULTURAL LAND CLASSIFICATION

Dinton Hall, Dinton,
Buckinghamshire.



AGRICULTURAL LAND CLASSIFICATION

DINTON HALL, DINTON, AYLESBURY

1. BACKGROUND

1.1 Land at this 65.8 hectare site was inspected on the 23rd-31st June 1991 in connection with a proposal for a sport and leisure complex development. At the time of survey the land was predominantly under pasture, except for a small area towards the south west of the site, that was under barley.

1.2 The survey was carried out using 1.2 m Dutch soil augers with sampling densities of approximately 100 m intervals on a regular sampling grid. In addition three soil pits were inspected to enable more detailed soil examination.

2. PHYSICAL FACTORS AFFECTING LAND QUALITY

Relief

2.1 The site lies between 74 and 86 m A.O.D. Land is highest towards the centre and north of the site, with land falling away towards the north, east, and west. Gradient is not a limitation in terms of land quality at this location.

Climate

2.2 Estimates of climatic variables were obtained by interpolation from a 5 km grid database (Met. Office, 1989) for a representative location in the survey area.

Climatic interpolation

Grid Reference	SP 700 050
Altitude m (A.O.D.)	74-86
Accumulated temperature (° day Jan-June)	1420-1407
Annual average rainfall (mm)	624-630
Field Capacity Days	133-132
Moisture deficit, wheat (mm)	111-108
Moisture deficit, potatoes (mm)	104-100

- 2.3 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). Although average annual rainfall is relatively low in a national context, there is no overall climatic limitation affecting the land quality of this site. However climatic factors do affect interactive limitations between soil and climate namely, soil wetness and droughtiness

Geology and Soils

- 2.4 British Geological Survey Sheet 46 SW (1834) shows much of the site to be underlain by Kimmeridge Clay, although across the lower slopes, adjacent to the village of Dinton, deposits of Portland stone and sand occur.
- 2.5 Soil Survey of England and Wales, Sheet 6 Soils of South East England (1983) shows the site to comprise soils of the Evesham II Association. These soils fall into two categories. "Calcareous Pelosols" whose brownish upper horizons are calcareous and well structured, and those which are termed "Pelo Stagnogleys" with non calcareous, often poorly structured greyish upper horizons with ochreous mottles (SSEW 1984).
- 2.6 Detailed field examination of the soils, indicates that there are two soil types present.

2.7 The first group of soils are those which occurs most extensively throughout the site, found predominantly on the lower-mid slopes. Profiles typically comprise medium or heavy clay loam topsoils, which may be calcareous or non calcareous. These rest over heavy clay loams in the upper subsoil and pass to clay between about 25 and 55 cm. Evidence of imperfect drainage in the form of distinctive mottling occurs between the surface and 55 cm. Occasional profiles were found to comprise medium or heavy clay loam topsoils over fine sandy clay loam or heavy clay loam subsoils which were found to be mottled and gleyed between 25 and 80 cm. Although these soils are imperfectly drained, the subsoils were not found to be slowly permeable.

2.8 The second group of soils comprise very calcareous medium or heavy clay loam topsoils, with c. 1-10% v/v small to medium calcareous mudstone fragments, over similar textures, with c. 10-20% v/v calcareous mudstone fragments in the subsoil, and becoming impenetrable, (to soil auger) due to the underlying geology of calcareous mudstone. Occasional profiles were found to comprise calcareous medium clay loam topsoils, over similar textures, with c. 2% v/v calcareous mudstone fragments, over fine sandy clay loam or heavy clay loam, becoming lighter in texture with depth, or becoming impenetrable (to soil auger) due to the underlying geology.

3. AGRICULTURAL LAND CLASSIFICATION

3.1 The ALC grading at this location is primarily determined by interactions between climate and soil factors, namely wetness and droughtiness.

Grade 3a

3.3 Land of this quality occupies approximately 33.6% (21.5 ha) of the total agricultural land of the survey areas, and occurs in two situations.

Grade 3a soils found on the mid slopes towards the centre, and to the east of the site, comprise calcareous heavy clay loam topsoils, with 1-3% v/v calcareous mudstone fragments, over similar textures, with c. 5-20% v/v calcareous mudstone fragments, becoming impenetrable (to soil auger) due to the underlying geology of calcareous mudstone, between about 50 and 60 cm. Occasional profiles were deeper over calcareous mudstone (i.e. 55-110 cm) and thus of a slightly higher quality. However the extent of such profiles were not sufficient to warrant delineating as a separate mapping unit.

These soils are well drained, wetness class I, but are restricted by droughtiness which is the main limitation to this land.

The second group of soils occurs on the lower slopes of the site towards the north and north east. Profiles typically comprise non calcareous to slightly calcareous medium or heavy clay loam topsoils, over heavy clay loam in the subsoil, which is mottled and gleyed between about 19-32 cm. Profiles pass to slowly permeable clay between about 40-75 cm. The clay has a stone content of about 5-20% v/v calcareous mudstone.

These soils are assigned to wetness class II and III. They possess both a wetness and workability restriction in terms of agricultural land quality, thereby limiting the quality to grade 3a.

Grade 3b

3.4 Land of this quality occupies approximately 40.4% (25.8 ha) to the total agricultural land within the survey area and occurs in two situations.

Profiles typically comprise non calcareous medium or heavy clay loam topsoils, over heavy clay loam with evidence of gleying occurring between the surface and 35 cm. Profiles pass to slowly permeable clay between about 26-50 cm. These soils are limited by wetness, resulting from slowly permeable clay horizons, which gives rise to impeded drainage. They are assigned to wetness class III and IV accordingly, and are limited in terms of their agricultural use, by poor drainage and workability restrictions.

The second group of 3b profiles, occur on the upper slopes along the southern boundary. Profiles typically comprise calcareous medium or heavy clay loam topsoils, with c. 2-10% v/v calcareous mudstone, over medium clay, with c. 2-20% v/v calcareous mudstone fragments. Profiles become impenetrable over mudstone between about 30 and 52 cm.

The soils are well drained and thus assigned to wetness class I, but are limited by droughtiness as a result of shallow depths over mudstone, which imposes a restriction in terms of agricultural land quality.

January 1992

Ref: 0301/012/91

N SHIRT/M LEEK

Resource Planning Group

Reading RO

SOURCES OF REFERENCE

BRITISH GEOLOGICAL SURVEY (1834) Sheet 46 SW.

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

METEOROLOGICAL OFFICE (1989) Climatic datasets for Agricultural Land Classification.

SOIL SURVEY OF ENGLAND AND WALES (1983) Sheet 6, Soils of South East England.

SOIL SURVEY OF ENGLAND AND WALES (1984) Soils and their use in South East England, Bulletin 15.