Cambs 20/89

AGRICULTURAL LAND CLASSIFICATION

LAND TO THE NORTH EAST OF BOURNE, LINCOLNSHIRE.

1.0 INTRODUCTION

1.1 An Agricultural Land Classification survey was carried out over approximately 97.9 ha (242 acres) of land on the northeast side of Bourne, Lincolnshire.

1.2 A total of 82 inspections were made using a dutch auger, to a depth of 1.2 m unless impenetrable material was encountered at a shallower depth. In addition two soil pits were dug to assess the subsoil conditions, along with the examination of a newly dug ditch.

1.3 At the time of survey the majority of the site was supporting arable crops, with two areas of grass, one alongside the A15 road in the north and the other immediately to the south of Mill Drove.

2. PHYSICAL FACTORS AFFECTING LAND QUALITY

Climate

2.1 The site lies in an area of low rainfall by national standards having an average annual amount of around 591 mm (23.3") (Met. Office, 1988). Bourne lies just within Agroclimatic Area 17 West (MAFF, 1984) which has an average growing season (*1) of 247 days. The median accumulated temperature (*2) is around 1441 day degrees and the site has a relatively low median duration of field capacity (*3) of 114 days (Met. Office, 1988). It is unlikely that the site is particularly frost-prone or exposed.

2.2 In overall terms, climatic factors place no limitation in terms of the agricultural land quality of the site.

*1 Length of time which the 30 cm (1 ft) soil temperature remains above 6°C (MAFF, 1984).

*2 A measure of the relative warmth of a locality; in this instance median accumulated temperature 0°C, January to June.

*3 A measure of soil wetness which estimates the duration of the period when soil moisture deficits are zero.

Relief

2.3 The site lies at the western margins of the Lincolnshire fens and the altitude ranges from approximately 4m AOD in the south and east, rising to approximately 12m AOD in the north and west. The land is generally flat in the south and east and gently sloping in the north. Gradient and altitude do not, however, constitute limiting factors in terms of the agricultural land classification of the site.

Geology and Soils

2.4 The geology of the site is shown on both the solid and drift editions of the 1:63,360 scale geological maps sheet no. 143 (Bourne) (Geol. Surv. 1972). The southern end of the site is underlain by Oxford Clays whilst much of the remainder is shown as Kellaways Sand with Cornbrash at the northern end. On the eastern side the majority of the solid geology is covered by the veneer of fen gravel.

2.5 The soils encountered in the survey reflect both the solid and drift geology of the area. Three distinct soil types were encountered.

2.6 Firstly, at the southern and eastern parts of the site, heavy textured soils overlying gravels at depth were encountered. These soils typically had a heavy clay loam or occasionally clay topsoil which was non calcareous overlying a heavy clay loam upper subsoil which was faintly mottled. Beneath this layer the texture became a clay and showed distinct ochreous and grey mottling. The deeper subsoil was generally slowly permeable and the soils were assessed as wetness class II. Beneath the clay subsoil gravel was often encountered within 1.2 m depth.

2.7 At the north western corner of the site, soils developed over the weathered Cornbrash limestone were found. These soils had a calcareous medium clay loam topsoil with common medium flaggy limestone overlying a medium or heavy clay loam subsoil which was moderately stony and impenetrable to the auger at 40-50 cm depth. The soil pit indicated that the subsoil stone increased with depth with moderate rooting to 50 cm depth, but few roots below.

2.8 Over the remainder of the site the soils were typically non calcareous or very slightly calcareous medium or heavy clay loams passing into similar textured subsoils which often become sandy clay loam at depth before impenetrable gravel was reached. The soils showed slight mottling at depth, but were generally assumed to be wetness class I. With the exception of some deeper subsoil horizons the soils were slightly or very slightly stony throughout, mainly comprising small flints and/or limestone fragments.

3.0 AGRICULTURAL LAND CLASSIFICATION

3.1 The site has been classified as grades 2, 3a and 3b. A breakdown of the areas is given below:

Grade	ha	%
2	47.0	48.0
3a	40.5	41.4
3b	10.4	10.6
TOTAL	97.9	100

Grade 2

3.2 Land of this quality is mapped where deep well or moderately well drained soils occur. These comprise medium clay loam, heavy clay loam or heavy silty clay loam topsoils over similar subsoils which may become sandier with depth. In this low rainfall area minor droughtiness limitations are found on land of this type. In addition the clayey topsoil textures result in minor workability restrictions. However, such soils form versatile agricultural land capable of growing a wide range of crops.

Sub-grade 3a

3.3 The heavier textured soils which show evidence of drainage imperfections have been assigned to this subgrade. These soils will therefore have both a wetness and workability limitation due to the presence of a slowly permeable subsoil and the heavy topsoil textures. In effect this will limit the periods when these soils can be

trafficked and worked without causing structural damage and hence reduce the versatility of the land.

Sub-grade 3b

3.4 The land in the north west corner of the site has been mapped as sub-grade 3b. These soils will suffer droughtiness limitations due to the restriction in rooting depth and the amount of limestone fragments in the subsoil. As this is a relatively low rainfall area, potential yields will generally be depressed.

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May 1989

References

Geological Survey of Great Britain (1964) 1:63,360 scale solid geology map sheet No 143 (Bourne).

Geological Survey of Great Britain (1972) 1:63,360 scale drift geology map sheet No 143 (Bourne).

MAFF (1984) Reference Book 432. Agricultural Climate of England and Wales.

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

Meteorological Office (1989) Climatological data for Agricultural Land Classification.