Cambs 10/89

AGRICULTURAL LAND CLASSIFCATION

INCORPORATING SOIL PHYSICAL CHARACTERISTICS

1.0 INTRODUCTION

This site was inspected on the 13th and 14th February 1989 in connection with proposals to extract sand and gravel. The site lies adjacent to an existing mineral extraction area and would form an extension to those workings. A total of 34 auger borings were made on site on a 100 m grid basis, superimposed on the national grid. The site comprises of 2 enclosures. At the time of survey the larger eastern enclosure was under oilseed rape and winter cereals. The smaller western enclosure was under plough. A soil storage mound is currently located alongside part of the boundary separating the 2 enclosures.

2.0 AGRICULTURAL LAND CLASSIFICATION

A table showing the % distribution of ALC grades is provided below:

ALC	Ha	%
3a	22.6	72.9
3b	7.4	23.9
N.A*	1.0	3.2
TOTAL	31.0	100·0

* = soil storage area.

The site is graded 3a, with smaller areas of 3b. The principal limitation to agricultural land quality is droughtiness. This derives chiefly from the presence of an iron-manganese cemented pan at depths of 60-70 cm, which is impenetrable to plant roots. To the west of the soil storage mound, however, and in small areas to the east of the site, this pan appears to be absent above 90 cm. Profiles in these areas are or approach grade 2, but occur too randomly to delineate separately. In the central and north eastern parts of the site the presence of moderately to very stony horizons above the pan, further reduce plant available water, and the land is graded 3b.

A full description of site physical factors is provided below :

3.0 SITE PHYSICAL FACTORS

Climate

3.1 Climate data for the site was obtained from the recently published agricultural climatic data set, jointly prepared by the Meteorological Office, MAFF and Soil Survey and Land Research Centre, (Met Office, 1989). This indicates that average annual rainfall totals in the vicinity of the site are 571 mm (22.8 inches), wihch is low by national standards. This fact, together with high summer temperatures result in the development of soil moisture deficitis. Meteorological Office data indicates that moisture deficits in the order of 121 mm for wheat and 116 mm for potatoes are likely to occur. In order to counter the effect of these deficits (in terms of drought stress on crops) it is necessary for the soils to hold adequate reserves of plant available water.

Relief

3.2 The site occupies level or very gently undulating land at approximately 6m above ordnance datum.

Geology & Soils

3.3 The geology of this area is indicated on the 1:50,000 scale solid and drift edition geology map as first terrace river gravels overlying Oxford clay. Field survey observations indicate that the gravel deposit, which is typically present below 60/70 cm is generally comprised of flint and limestone fragments, is strongly calcareous and is typically cemented to form a hard pan. The fine loamy (sandy clay loam and clay loam) soils occurring above this depth are generally non calcareous in the upper horizons but become strongly calcareous as the gravel deposit, and/or stony horizons are encountered.

Although patches of deeper and shallower soils over gravel occur randomly across the site, they do not occur in sufficiently large and/or discrete areas to permit separate delineation.

In the physical characteristics section which follows, therefore the soils have been treated as a single unit.

4.0 *SOIL PHYSICAL CHARACTERISTICS*

Topsoil Texture : Predominantly fine sandy clay loam, clay loam or sandy clay loam. However, lighter sandy loam, fine sandy silt loam and medium clay loam textures occur along the northern and western boundaries of the smaller, western enclosure.

stone : Occasional small and very small flints

depth : in the range 35-40 cm, typically 37/38 cm

boundary : smooth, clear

$CaCO_3$: typically non calcareous, but variable.

***Subsoil** texture: typically sandy clay loam, clay loam or fine sandy clay loam. May contain/overlie lenses of clay or sandy loam, especially at depth.

stone : typically stoneless or very slightly stony (5%). However, approximately 30% of profiles, mainly located in north eastern and central areas contain moderately to very stony (20-40% volume) horizons below 40/45 cm depth . Stones typically comprise of small and very small flints and limestone fragments.

structure : typically weakly to moderately developed coarse subangular blocky, friable. (Indeterminate in stonier horizons)

depth : Generally in the range 70-80 cm. However, in the north eastern and central parts of the site shallower profiles over gravel/cemented pan occur which are in the depth range 55-66 cm (typically 60 cm). To the west of the soil storage mound and along the northern edge of the smaller enclosure subsoils extend to in excess of 90 cm depth.

*may contain more than one discrete horizon.

$CaCO_3$: increasingly calcareous with depth

porosity : in the range of .3-.5% biopores

boundary : abrupt wavey lower boundary - where pan is present.

Gravel/Pan : comprises of black iron-manganese cemented flint and limestone fragments, penetrated with difficulty by digging implements. This effectively forms a barrier to root penetration.

Drainage : The soils are assessed as Wetness Class II.

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