

## **AGRICULTURAL LAND CLASSIFICATION**

### **LAND AT CLIPSTONE ROAD, MANSFIELD, NOTTS.**

#### **1.0 BACKGROUND**

- 1.1 A detailed survey was carried out over 19.8 ha immediately north-east of Mansfield's urban limit. The site is one of several being surveyed in connection with the Mansfield District Local Plan.
- 1.2 The site is bounded on the west and north by housing development. To the east and south are small areas of agricultural land themselves enclosed by old mineral workings and railways. The site itself is bisected by a track running more or less north to south.
- 1.3 On the published 1:63 360 scale Agricultural Land Classification (ALC) map (MAFF, 1970) the whole area is mapped as Grade 3. However, this map is of a reconnaissance nature and since its publication the ALC system has been revised (MAFF, 1988). The current survey was undertaken, therefore, to provide site-specific land quality and soil information.
- 1.4 A total of 19 auger borings was made using a dutch auger to a depth of 1.2 m unless stopped by impenetrable stony layers. The stone content of all topsoils was established by sieving. In addition, 2 soil pits were dug to assess subsoil conditions in more detail. The fieldwork was carried out during January 1996.
- 1.5 At the time of the survey most of the land was lying bare after arable production, mostly of carrots and other root crops.
- 1.6 Land quality has been assessed on the basis of its agricultural potential in an irrigated state, since irrigation from an adequate and assured water supply is currently practised.

## 2.0 PHYSICAL FACTORS AFFECTING LAND QUALITY

### Climate

- 2.1 Climatic criteria are considered when classifying land as these may have an overriding limitation in terms of the agricultural use of the land. The main parameters used in the assessment of the overall climatic limitation are average annual rainfall, as a measure of overall wetness, and accumulated temperature (day °C Jan-June) as a measure of the relative warmth of an area.
- 2.2 A detailed assessment of the prevailing climate for the site has been made by interpolation from the 5 km grid dataset produced by the Meteorological Office (Met. Office, 1989). The details are given in Table 1 and these show that there is a slight climatic limitation affecting the site. Also, climatic factors interact with soil properties to influence soil droughtiness.

**Table 1: Climatic Interpolation**

Grid reference	SK 574 625
Altitude (m)	115
Accumulated Temperature (day °C, Jan-June)	1312
Average Annual Rainfall (mm)	695
Moisture Deficit, Wheat (mm)	95
Moisture Deficit, Potatoes (mm)	82
Field Capacity (days)	151
Overall Climatic Grade	2

### Altitude and Relief

- 2.3 The site is part of an undulating plateau that slopes gently (2° - 6°) south-eastwards towards the valley of Vicar Water, outside the survey area. A small, shallow, dry valley runs across the site from the west to the south-east. The

highest land, 117 m AOD, is in the north-west corner and the lowest point, 88 m AOD, occurs on the southern boundary. Neither altitude nor relief impose any limitation on the agricultural quality of the site.

### Geology and Soils

- 2.4 The published 1:63 360 scale geological map (Geol. Survey, 1966) shows the site to be underlain by Permo-Triassic Bunter Pebble Beds.
- 2.5 There is no published detailed soil map of the site. The reconnaissance soil survey map for the area (Soil Survey, 1983) shows all of the site to comprise soils from the Cuckney 1 association, essentially well-drained sandy and coarse loamy soils with a risk of wind erosion.
- 2.6 The detailed survey carried out on the site shows the presence of a single soil type, namely a deep, non-calcareous well-drained loamy sand over sand with a variable stone content. Characteristically, the topsoil, to 35 - 40 cm, is a very dark greyish brown loamy medium sand, although occasional topsoils are medium sandy loam texture. Topsoil stone content is commonly in the range of 4 -12%, most of the stones being small and medium rounded pebbles. The subsoil is a brown, strong brown, light brown or reddish brown medium sand extending to more than 120 cm, although its upper part may sometimes be loamy medium sand texture. The subsoil stone content is similar to that of the topsoil, although bands and pockets may contain up to 25% stones. The soil is well-drained and is classified as Wetness Class I.

### **3.0 AGRICULTURAL LAND CLASSIFICATION**

- 3.1 The land has been classified using the guidelines contained in the Agricultural Land Classification of England and Wales (MAFF, 1988). A breakdown of the grades found on the site is given in Table 2 and a description of each grade is given in Appendix 1. At this site the factors which primarily determine grading

are the soil droughtiness (a function of soil texture, structure and stoniness relative to the crop adjusted moisture deficits in the area) and the presence of irrigation. Overall, none of the land can be classified higher than Grade 2 on account of a slight climatic limitation.

**Table 2: Distribution of Grades and Subgrades**

Grade	Area (ha)	%
2	18.7	94
Other land	1.1	6
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Total	19.8	100

### Grade 2

- 3.2 Virtually all the land is mapped as Grade 2. Moisture balance calculations for the loamy sand over sand soils show that the available water capacity is limiting for the requirements of certain crops, giving rise to a moderate droughtiness limitation. However, adequate irrigation is available to offset these deficits and consequently the land has been upgraded from Subgrade 3a to Grade 2. The sandy soils may be liable to erosion but there is no evidence of this problem on the site.
- 3.3 Within the Grade 2 land occur very small areas where the content of medium-sized stones in the topsoil is such (>10%) that a Subgrade 3a classification is warranted. However, these small areas cannot be delineated separately at the scale of mapping.

Other land

- 3.4 Non-agricultural land comprises the track through the centre of the site.

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## REFERENCES

GEOLOGICAL SURVEY OF GREAT BRITAIN, 1966. Sheet 113, Ollerton. Solid and Drift Edition, Scale 1:63 360.

MAFF, 1970. Agricultural Land Classification Map. Provisional. Scale 1:63 360, Sheet 112.

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

METEOROLOGICAL OFFICE, 1989. Climatological Data for Agricultural Land Classification.

SOIL SURVEY OF ENGLAND AND WALES, 1983. Sheet 4, "Soils of Eastern England". Scale 1:250 000 .

## 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 include 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 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 levels of yields. It is mainly suited to grass with occasional arable crops (e.g. cereals and forage crops) the yield 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.