FRCA

# LAND AROUND SAMPSON'S LANE FARM, MANSFIELD, NOTTINGHAMSHIRE.

**Agricultural Land Classification**
**ALC Map and Report**

**December 1998**

**FARMING AND RURAL CONSERVATION AGENCY**
*An Executive Agency of the Ministry of Agriculture, Fisheries and Food and the Welsh Office*

# AGRICULTURAL LAND CLASSIFICATION REPORT

# LAND AROUND SAMPSON'S LANE FARM, MANSFIELD, NOTTINGHAMSHIRE

## INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 160 ha of land to the north west of Mansfield, Nottinghamshire, centred on grid reference SK 509 629. The survey was carried out during December 1998.

2. The survey was carried out by the Farming and Rural Conservation Agency (FRCA) for the Ministry of Agriculture, Fisheries and Food (MAFF), in connection with the Mansfield Local Plan process. This survey supersedes previous ALC information for this land.

3. The work was conducted by members of the Resource Planning Team in the Eastern Region of FRCA. The land has been graded in accordance with the published MAFF ALC guidelines and criteria (MAFF, 1988). A description of the ALC grades and subgrades is given in Appendix I.

4. At the time of survey the land use on the site was a mix of cereal and oilseed rape production with fields, particularly in the south and east of the site, having been cultivated but not yet sown with a crop. Pasture was found in the small fields close to Sampson's Lane Farm and Penniment Lodge Farm. Additionally an area of rough grassland was found in the east of the site. The areas mapped as 'Other Land' include all the surfaced roads, farms and associated buildings and hard standing. Also included is the woodland and pond area known as Cotton Plantation, the gas pipeline installation to the north west of Penniment Lodge Farm and a garden area in the west of the site.

## SUMMARY

5. The findings of the survey are shown on the enclosed ALC map. The map has been drawn at a scale of 1:10 000; it is accurate at this scale but any enlargement would be misleading.

6. The area and proportions of the ALC grades and subgrades on the surveyed land are summarised in Table 1.

**Table 1: Area of grades and other land**

| Grade/Other land | Area (hectares) | % surveyed area | % site area |
|---|---|---|---|
| 2 | 69.1 | 46 | 43 |
| 3a | 47.9 | 32 | 30 |
| 3b | 34.0 | 22 | 21 |
| Other land | 9.0 | N/A | 6 |
| Total surveyed area | 151.0 | 100 | 94 |
| Total site area | 160.0 | - | 100 |

7. The fieldwork was conducted at an average density of one boring per hectare. A total of one hundred and fifty seven borings and eight soil pits was described.

8. The land within the site consists of a mix of Grade 2 (very good quality agricultural land), Subgrade 3a (good quality agricultural land) and Subgrade 3b (moderate quality agricultural land) with Grade 2 land being the most extensive. The limiting factors for the land was found to be predominantly droughtiness and/or climatic limitations with smaller areas of land being limited by wetness and workability. A number of sample points were also equally limited by soil depth. Additionally, small areas of the site were limited to Subgrade 3b by gradient.

## FACTORS INFLUENCING ALC GRADE

### Climate

9. Climate affects the grading of land through the assessment of an overall climatic limitation and also through interactions with soil characteristics.

10. The key climatic variables used for grading this site are given in Table 2 and were obtained from the published 5 km grid datasets using the standard interpolation procedures (Met. Office, 1989).

**Table 2: Climatic and altitude data**

| Factor | Units | Values | Values | Values | Values |
|---|---|---|---|---|---|
| Grid reference | N/A | SK 509 629 | SK 502 629 | SK 507 635 | SK 513 630 |
| Altitude | m, AOD | 140 | 150 | 135 | 130 |
| Accumulated Temperature | day°C (Jan-June) | 1285 | 1273 | 1290 | 1296 |
| Average Annual Rainfall | mm | 711 | 716 | 705 | 705 |
| Field Capacity Days | days | 161 | 162 | 160 | 160 |
| Moisture Deficit, Wheat | mm | 91 | 90 | 92 | 93 |
| Moisture Deficit, Potatoes | mm | 77 | 76 | 78 | 79 |
| Overall climatic grade | N/A | Grade 2 | Grade 2 | Grade 2 | Grade 2 |

11. The climatic criteria are considered first when classifying land as climate can be overriding in the sense that severe limitations will restrict land to low grades irrespective of favourable site or soil conditions.

12. The main parameters used in the assessment of an overall climatic limitation are average annual rainfall (AAR), as a measure of overall wetness, and accumulated temperature (AT0, January to June), as a measure of the relative warmth of a locality.

13. The combination of rainfall and temperature at this site mean that agricultural land quality is restricted to a maximum of Grade 2 even if all other factors are favourable.

**Site**

14. The site occupies land to the north west of Mansfield. It is bounded by Top Lane to the south west with Pleasleyhill and Radmanthwaite to the north east. Open farmland is found to the north west and south east. The site is generally undulating with gentle slopes. The land rises in the west to a maximum altitude of approximately 150 m AOD with a distinct valley feature around Moorhaigh Farm with steep slopes in excess of 8°. Additionally steep slopes are found in the east of the site again in a small valley feature around Cotton Plantation. Therefore there are small areas where gradient limits the quality of the agricultural land to Subgrade 3b but over the majority of the site there are no limitations due to relief or gradients.

**Geology and soils**

15. The published 1:63 360 scale geology map of the area (Geol. Survey, 1971) shows the whole of the site to be underlain by Lower Magnesian Limestone.

16. The 1:250 000 reconnaissance scale soil survey map for the area (Soil Survey, 1983) shows the whole of the site as soils of the Aberford Association which is briefly described as shallow, locally brashy, well drained calcareous fine loamy soils over limestone with some deeper soils in colluvium.

17. During the current, more detailed survey, two soil types have been identified and are described briefly below.

*Soil Type I*

18. This soil type is found in limited areas in the west and east of the site and consists of a very slightly stony medium or heavy clay loam or occasionally clay textured topsoil overlying a slowly permeable red clay subsoil. Occasionally a thin upper subsoil of reddish or brown medium or heavy clay loam is found. This soil type exhibits moderate to poor drainage characteristics.

*Soil Type II*

19. This soil type was found over the majority of the site and was variable but essentially consisted of well drained profiles with a very slightly or slightly stony medium clay loam or fine sandy silt loam topsoil usually overlying a variable thickness of similar textured or slightly heavier subsoil horizons. The subsoil in turn overlies limestone material. The underlying limestone was generally slightly weathered and formed a thin sandy textured horizon above the harder bedrock. The subsoil horizons contained varying amounts of limestone fragments and blocks. Occasionally the topsoil directly overlies the limestone bedrock.

**AGRICULTURAL LAND CLASSIFICATION**

20. The details of the classification of the site are shown on the attached ALC map and the area statistics of each grade are given in Table 1, page 1.

21. The location of the auger borings and pits is shown on the attached sample location map.

**Grade 2**

22. Land of Grade 2 quality is found across the site and is associated with Soil Type II (paragraph 19) where the soil is sufficiently thick above the limestone bedrock to supply sufficient moisture for crop growth so that drought is not limiting or only slightly limiting. These soils are therefore limited to this grade either by slight droughtiness and/or a climatic limitation. The latter restricts all the land within the survey area to a maximum of Grade 2 quality. Occasionally areas of Grade 2 land were also equally limited by the relatively thin overall depth of the soil above the bedrock.

**Subgrade 3a**

23. The majority of land mapped as Subgrade 3a is associated with areas of Soil Type II in which the subsoil is relatively thin above the underlying bedrock (paragraph 19). Hence these areas have a moderate droughtiness and/or soil depth limitation restricting such areas to Subgrade 3a. Occasionally small areas of Soil Type I (paragraph 18) are mapped as Subgrade 3a where the permeable upper subsoil is of sufficient thickness above the slowly permeable lower subsoil for the profile to be assessed as Wetness Class III. This land is restricted to this grade due to a moderate wetness and workability limitation.

**Subgrade 3b**

24. The areas of the site mapped as Subgrade 3b quality are associated with the relatively poorly drained Soil Type I (paragraph 18) in which the Wetness Class is assessed as IV. This wetness class together with a medium clay loam, heavy clay loam or clay textured topsoil under the prevailing climate for the site result in a significant wetness and workability limitation restricting such land to Subgrade 3b. Areas in which Soil Type II are very shallow (paragraph 19) are also mapped as Subgrade 3b. These very shallow soils in which the subsoil is either absent or very thin above the bedrock have a significant droughtiness limitation restricting such profiles to Subgrade 3b and may also be equally limiting for land quality with a soil depth restriction. Additionally in limited areas of the site, gradients above 8° restrict land quality to Subgrade 3b.

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## SOURCES OF REFERENCE

British Geological Survey (1971) *Sheet No.* 112, *Chesterfield. Solid and Drift Edition* BGS: London.

Ministry of Agriculture, Fisheries and Food (1988) *Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land.* MAFF: London.

Met. Office (1989) *Climatological Data for Agricultural Land Classification.* Met. Office: Bracknell.

Soil Survey of England and Wales (1983) *Sheet* 3, *Midland and Western England.* SSEW: Harpenden.

## APPENDIX I

## DESCRIPTIONS OF THE GRADES AND SUBGRADES

### 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 or horticultural crops can usually be grown but on some land of this 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 land.

### Grade 3: Good to Moderate Quality Land

Land with moderate limitations which affect the choice of crops, the timing and type of cultivation, harvesting or the level of yield. When 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 the level of yields. It is mainly suited to grass with occasional arable crops (e.g. cereals and forage crops) the yields of which are variable. In moist 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 severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.