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AGRICULTURAL LAND CLASSIFICATION

MARKET GARDENS AND ALLOTMENTS AT BURLEY MILLS, KIRKSTALL

Report Commissioned by the
Kirkstall Valley Campaign,
The National Farmers' Union and the
Burley Mills Allotments Association

ADAS
LEEDS REGIONAL OFFICE

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AGRICULTURAL LAND CLASSIFICATION REPORT ON LAND AT BURLEY MILLS, KIRKSTALL, LEEDS

1.1 INTRODUCTION

The site is located around National Grid Reference SE 268348 in the Aire Valley about 3 km north west of Leeds city centre. The survey area is bounded by the River Aire to the south and an artificial watercourse known as The Goit to the north. It covers an area of 6.7 hectares most of which is used for market gardens and allotments. Agricultural Land Classification (ALC) survey work was carried out in March 1989 when soils were examined by hand auger borings to a depth of one metre. Borings were made at points predetermined by the National Grid at a density of four borings per hectare.

Land quality assessments were made using the revised guidelines published by the Ministry of Agriculture, Fisheries and Food (MAFF) in 1988. Definitions of all terms used in this report can be found in this publication. Brief descriptions of the 5 land quality grades defined by MAFF are given below:-

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 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 root 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 level of yields. It is mainly suited to grass with occasional arable crops (eg 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 very severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

1.2 CLIMATE AND RELIEF

Average annual rainfall is approximately 681 mm and the accumulated temperature above 0°C (January to June) is 1373 day °C. The land is at field capacity (ie maximum wetness) for about 178 days a year. There is thus no overall climatic limitation on ALC grade.

The site is level and lies on the floodplain of the River Aire at an average altitude of 40 m aod. Although in a floodplain situation, flooding, according to the Yorkshire Water Authority, is rare, the last flood being in the late 1940s. Agricultural land quality is not affected by floods occurring less than once in 14 years.

1.3 GEOLOGY AND SOILS

All soils are formed on light textured stoneless river alluvium. Away from the river this gives medium or fine sandy loam topsoils over similar textured subsoils. Towards the river textures are somewhat lighter and topsoils consist of loamy fine sand over medium and coarse sand or loamy sand. Droughtiness calculations suggest that these lighter soils will be slightly droughty in summer for crops such as wheat and potatoes. The slightly loamier soils away from the river have a higher available water capacity[1] and are not limited by droughtiness.

All the soils on the site are stoneless, unmottled and contain no slowly permeable[2] layer and thus fall within wetness class I (ie well drained).

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[1] Available water capacity is a measure of the amount of water held in a soil which can be used by plants.

[2] Slowly permeable layer - poorly structured clayey or heavy textured layer through which water passes very slowly and so causes waterlogging in the soil above.

1.4 LAND USE

The site is used at present for market gardening and allotments. In the MAFF Agricultural Land Classification system allotments are usually placed within the 'non-agricultural' category even though they are producing crops. This is done only because it is normally difficult to obtain access and permission to survey small areas in multiple occupancy. In this case, however, access was freely available and the land has been assessed as normal agricultural land.

1.5 AGRICULTURAL LAND CLASSIFICATION

Grade	Area	% of agricultural land area	% of total land area
1	4.9	77%	73%
2	0.4	6%	6%
3a	1.1	17%	16%
Non Agricultural	0.3	-	5%
Total	6.7	100%	100%

1.5.1 Grade 1

Land in this grade is widespread away from the river. Both topsoils and subsoils may be of either medium or fine sandy loam. The profiles are deep, stoneless, unmottled and fall within wetness class I. There is no droughtiness limitation because of the high available water capacity typical of deep sandy loam soils.

This land has no climatic limitations, it is easily worked, and is very rarely at risk of flooding. It is capable of growing a very wide range of agricultural and horticultural crops thus meeting the Grade 1 definition of 'excellent quality agricultural land'.

1.5.2 Grade 2

The small area of Grade 2 land at the south eastern end of the site contains similar soils to the Grade 1 land. Subsoils, however, are slightly lighter, often of loamy fine sand. This reduces the available water capacity of the soil making it slightly droughty for potatoes and limiting it to Grade 2 except where irrigation is already available.

1.5.3 Subgrade 3a

Alongside the river the soils are lighter. Topsoils and upper subsoils are usually of stoneless loamy medium or fine sand passing into coarse gritty sand at depth. Although these soils are very easy to work they are droughty for both wheat and potatoes and restricted to subgrade 3a for this reason. With irrigation it would be possible to upgrade this area to Grade 2.

1.5.4 Land not in agricultural use

A small area of scrubby woodland adjoining the river has been placed in this category.

Reference

MAFF (1988) Revised guidelines and criteria for grading the quality of agricultural land.

MAPS

SCHEDULE OF SOIL AUGER BORINGS

Glossary of abbreviations used.

cs	coarse sand
lcs	loamy coarse sand
ms	medium sand
lms	loamy medium sand
lfs	loamy fine sand
msl	medium sandy loam
fsl	fine sandy loam
szl	sandy silt loam
fszl	fine sandy silt loam
fscl	fine sandy clay loam

Soil textures are defined according to the MAFF Agricultural Land Classification system.

All soil colour (eg 10YR3/1) are defined according to the Munsell soil colour system (Munsell Color Company Inc, Baltimore, Maryland, 21218, USA)

BURLEY MILLS, SCHEDULE OF SOIL AUGER BORINGS

BORING	DEPTH (cm)	TEXTURE	COLOUR	MOTTLES
001	0-20	msl	10YR31	-
	20-100	msl	10YR54	-
002	0-25	msl	10YR32	-
	25-100	msl	10YR54	-
003	0-25	msl	10YR32	-
	25-100	msl	10YR54	-
004	0-30	msl	10YR32	-
	30-100	msl	10YR54	-
005	0-30	fsl	10YR32	-
	30-100	lfs	10YR54	-
006	0-30	fsl	10YR32	-
	30-100	lms	10YR54	-
007	0-30	fsl	10YR32	-
	30-100	msl	10YR54	-
008	0-25	msl	10YR32	-
	25-100	msl	10YR54	-
009	0-30	fsl	10YR32	-
	30-60	lms	10YR54	-
	60-100	ms	10YR54	-
010	0-30	fsl	10YR32	-
	30-60	lms	10YR54	-
	60-100	cs	10YR54	-

BORING	DEPTH (cm)	TEXTURE	COLOUR	MOTTLES
011	0-30	fsl	10YR31	-
	30-100	fsl.szl	10YR54	-
012	0-35	msl	10YR31	-
	35-100	msl	10YR54	-
013	0-30	msl	10YR31	-
	30-100	msl	10YR54	-
014	0-40	fsl.fscl	10YR32	-
	40-100	fsl	10YR54	-
015	0-30	lfs	10YR42	-
	30-100	lms	10YR66	-
016	0-25	fsl	10YR42	-
	25-60	lfs	10YR54	-
	60-100	fsl	10YR64	-
017	0-25	fsl	10YR42	-
	25-60	fsl	10YR54	-
	60-100	fszl	10YR54	-
018	0-25	fsl	10YR42	-
	25-60	fsl	10YR54	-
	60-100	lms	10YR53	-
019	0-25	fsl	10YR42	-
	25-75	fsl	10YR54	-
	75-120	lcs	10YR64	-
020	0-25	fszl	10YR32	-
	25-80	fszl	10YR54	-
	80-120	lcs	10YR53	-

BORING	DEPTH (cm)	TEXTURE	COLOUR	MOTTLES
021	0-45	msl	10YR32	-
	45-120	msl	10YR54	-
022	0-45	fsl	10YR42	-
	45+	cinders		-
023	0-0	scb.wood		-
024	0-25	fsl	10YR32	-
	25-66	fsl	10YR54	-
025	0-25	msl	10YR54	-
	25-55	lms	10YR54	-
	55-85	msl	10YR53	-
	85-100	lcs	10YR62	-
026	0-33	msl	10YR32	-
	33-55	msl	10YR54	-
	55-85	lms	10YR53	-
	85-120	lcs	10YR53	-
027	0-32	msl	10YR42	-
	32-120	lms.msl	10YR54	-
028	0-25	lms	10YR32	-
	25-75	lms	10YR54	-
	75-120	lcs	10YR68	-