STATEMENT OF PHYSICAL CHARACTERISTICS
AND
AGRICULTURAL LAND CLASSIFICATION
LAND AT BISHOP MIDDLEHAM
CO DURHAM
DECEMBER 1992

ADAS
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SUMMARY

A Statement of Physical Characteristics and Agricultural Land Classification survey of 53ha of land at Bishop Middleham was carried out in December 1992.

Approximately 21ha of Grade 2 land occurs on the site. Profiles on this land consist typically of very slightly to slightly stony medium clay loam topsoils and subsoils overlying weathering limestone bedrock at between 60 and 100cm depth. The ALC grade of this land is limited by overall climate and, in places, soil droughtiness and topsoil stoniness.

Approximately 15ha of Subgrade 3a land occurs on the site. Soil profiles are similar to those described above but weathering limestone bedrock typically occurs at around 45cm depth. Soil droughtiness, soil depth and topsoil stoniness are the factors limiting this land to Subgrade 3a.

There is also 7ha of Subgrade 3b land. Slightly stony medium clay loam topsoils directly overlie weathering limestone bedrock at around 30cm depth. Soil droughtiness and, in places, soil depth are the factors limiting ALC grade in this case.

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1. INTRODUCTION AND STATEMENT OF PHYSICAL CHARACTERISTICS

1.1 Location and Survey Methods

The site lies 4½Km north-west of Sedgefield and is centred on Grid Reference NZ326326. Survey work was carried out in December 1992 when soils were examined by hand auger borings at a rate of one boring per hectare at intervals predetermined by the National Grid. Extra borings were made, where necessary, to refine grade boundaries and two soil pits were dug to allow the assessment of subsoil structure and depth to bedrock. Land quality was assessed using the methods described in "Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land" (MAFF, 1988).

1.2 Land Use and Relief

At the time of survey, 98% of the site was in arable use (principally cereals and oilseed rape). Site altitude varies from 110m AOD in the south east to 135m AOD in the centre and north. The area is gently sloping (typically 1-3°) with an easterly or south-easterly aspect.

1.3 Climate

Grid Reference	:	NZ 326326
Altitude (m)	:	120m
Accumulated Temperature above 0°C (January-June)	:	1225 day°C
Average Annual Rainfall (mm)	:	683
Climatic Grade	:	2
Field Capacity Days	:	174
Moisture Deficit (mm) Wheat	:	87
Moisture Deficit (mm) Potatoes	:	71

1.4 Geology, Soils and Drainage

The area is underlain by the Permian Magnesian Limestone which occurs within 1m of the surface over much of the site. Soils are formed in loamy or silty material derived from weathering of the limestone. Profiles are well drained, falling into Wetness Class I. Topsoils and subsoils are generally medium-textured, typically consisting of medium clay loams with a variable stone content.

1.5 Soil Properties

The three soil resource units separated on this site are depth variants of a well drained medium-textured soil overlying limestone, descriptions of which are given below. Topsoil and subsoil resources are also shown on the accompanying maps along with soil thickness and volume information.

a. Variant 1:- Shallow medium textured soils (Unit T1/Weathering Limestone) (Full Profile Description, Table 1)

This soil, formed on limestone, occurs in the north of the site. It is characterised by shallow well drained topsoils formed in medium textured material (medium clay loam) derived from limestone. The topsoil directly overlies weathering limestone bedrock at a mean depth of 30cm.

b. Variant 2:- Medium depth, medium textured soil (Unit T1/S1A) (Full Profile Description, Table 2)

This soil, formed on limestone occurs in a band running from the north-east to the south-west of the site. It is characterised by well drained topsoils and subsoils formed in medium clay loam derived from limestone. Weathering limestone occurs at a mean depth of 40cm from the surface.

c. Soil Type 3:- Deep medium textured soils (Unit T1/S1B)

This soil occurs in the north and south of the site. It is characterised by deep well drained profiles formed in medium-textured material derived from limestone. Weathering limestone bedrock occurs at a mean depth of 75cm.

1.6 Soil Resources

(i) Topsoils

Unit T1 occurs over the whole site. It is medium-textured (medium clay loam) and very slightly to slightly stony. It has a moderately developed medium angular to subangular blocky structure and a median thickness of 30cm.

(ii) Subsoils

Unit S1A occurs in a band running from the north-east to the south-west of the site. It is very similar to Unit S1B but has a mean thickness of only 10cm.

Unit S1B occurs in the north and south of the site. It generally consists of medium clay loam, although heavy clay loam occurs in places. This unit is very slightly to slightly stony and has a moderately developed medium angular blocky to subangular blocky structure. Mean thickness is 45cm.

2. SOIL PROFILE DESCRIPTIONS

Table 1 Shallow medium-textured soil, T1/Limestone

Profile Pit 1 Slope: 1°C Land Use: Oilseed Rape Weather: Wet and Windy

Depth cm	Description
0-25	Very dark greyish brown (10YR3/3) medium clay loam; no mottles; slight stony (7% small, medium and large subangular and subrounded limestones); very moist; moderately developed medium angular to subangular blocky structure; firm soil strength; moderately porous; common fine and medium fibrous roots; slightly sticky; slightly plastic; non-calcareous; gradual irregular boundary.
25+	Weathering soft limestone with strong brown (7.5YR4/6) medium clay loam in interstices; extremely stony (70-80% small to very large subrounded and subangular limestones); few fine fibrous roots.

Table 2 Medium depth, medium-textured soil, T1/S1A

Profile Pit 2 Slope: 2°S Land Use: Cereals Weather: Wet and Windy

Depth(cm)	Description
0-30	Dark brown (7.5YR3/2) medium clay loam; no mottles; slightly stony (8% small, medium and large subangular and subrounded limestones); very moist; moderately developed medium angular blocky structure; firm soil strength; slightly porous; common fine and medium fibrous roots; slightly sticky; slightly plastic; non-calcareous; clear smooth boundary.
30-50	Strong brown (7.5YR4/6) medium clay loam; no mottles; slightly stony (6-8% small, medium and large subangular and subrounded limestones); moist; moderately developed medium angular blocky structure; firm soil strength; slightly porous; common fine and medium fibrous roots; slightly sticky; slightly plastic; non-calcareous; abrupt smooth boundary.
50-120	Pale yellow (2.5Y8/3) very soft weathering limestone; no mottles; slightly stony (12% small and medium subrounded limestones); slightly moist; structureless; porous; common fine and medium fibrous roots; non-sticky; non-plastic; calcareous.

3. AGRICULTURAL LAND CLASSIFICATION

The ALC grades occurring on this site are as follows:-

Grade/Subgrade	Hectares	Percentage of Total Area
1		
2	28.96	54.8
3a	15.34	29.0
3b	7.65	14.5
4		
5		
(Subtotal)	(51.95)	(98.3)
Urban	0.79	1.5
Non Agricultural	0.09	0.2
Woodland - Farm		
- Commercial		
Agricultural Buildings		
Open Water		
Land not surveyed		
(Subtotal)	(0.88)	(1.7)
TOTAL	52.83	100

3.1 Grade 2

Grade 2 land occurs in a band running from north to south through the centre of the site. Topsoils consist of very slightly to slightly stony medium clay loams (typically containing 4-6% small to large subangular limestones) which overlie similarly textured subsoils. Profiles are well-drained (Wetness Class I), and soft weathering limestone bedrock typically occurs at between 60cm and 100cm depth. The overall climate of the area and, in places, slight soil droughtiness and topsoil stoniness are the factors limiting this land to Grade 2.

3.2 Subgrade 3a

Land in this subgrade occurs in two separate areas in the north-east and south-west of the site. Profiles are well-drained (Wetness Class I) and typically consist of medium clay loam topsoils overlying similarly textured subsoils. Most profiles are very slightly to slightly stony (containing 4-8% small to large subangular limestones) and weathering limestone bedrock typically occurs at around 45cm depth. Soil droughtiness and, in places, soil depth and topsoil stoniness are, thus, the factors which limit this land to Subgrade 3a.

3.3 Subgrade 3b

Subgrade 3b land occurs in the north of the site and in a small area in the south east. A slightly stony medium clay loam topsoil directly overlies soft weathering limestone bedrock at around 30cm depth. Profiles are well-drained (Wetness Class I) but the soils are moderately droughty and it is this factor, as well as soil depth in places, which limits this land to Subgrade 3b.

3.4 Urban

This refers to a minor road in the south west of the site.

3.5 Non-Agricultural

This refers to a small area of scrub in the west of the site.

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MAPS