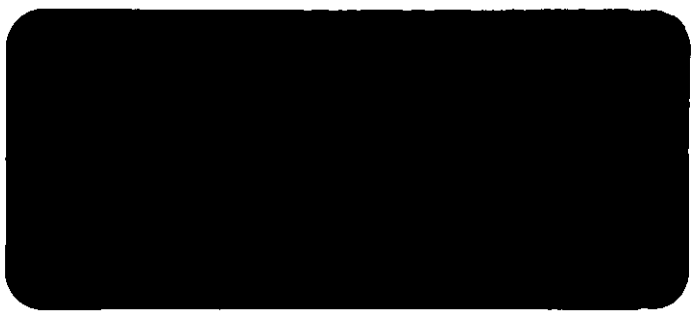
ADAS LAND MANAGEMENT SERVICES



A D A S

OVE ARUP AND PARTNERS

on behalf of

KELT UK LIMITED

SOIL RESOURCES

AND

AGRICULTURAL LAND CLASSIFICATION

CLAYPIT PLANTATION

EAST KNAPTON

NORTH YORKSHIRE

March 1990

I Condliffe BSc, MSc, MIAgrE
Leeds Regional Office
Lawnswood
Leeds LS16 5PY

ADAS

CONTENTS

MAPS

1. SOIL RESOURCES

A. GENERAL

Introduction

The survey area lies approximately 12 km east of Malton, North Yorkshire. It consists of a 9.8 ha field called Claypit Plantation and an access road, 5.5 metres wide and approximately 1230 metres in length. The central grid reference of the field is SE886769. The access road runs west from the north west corner of the field to join the B1258 just south of Knapton Station.

Survey work was carried out in March 1990. Soils were examined by hand auger borings to a depth of between 100 and 120 cms at a density of 2 per hectare on Claypit Plantation and every 50 metres along the access road. Supplementary borings were made where necessary to refine grade and soil boundaries. A soil inspection pit was dug in the main soil type to record soil structures and stone content.

Climate, Relief and Altitude

The average annual rainfall is approximately 579 mm (22.8"). Accumulated temperature above 0°C (January-June) is 1357°C. The soils are at field capacity for approximately 167 days and the maximum moisture deficit is 104 mm for wheat and 94 mm for potatoes. These characteristics impose no overall climatic limitation on land grade.

The altitude of the field and access road is between 23 and 25 m above ordnance datum and the relief essentially flat.

Geology

Kimmeridge clays underlie the site. These are in turn overlain by post-glacial sands and gravels.

Drainage

The soils on both the field and access road are well drained. There is evidence of gleying in subsoils indicating a seasonal waterlogging but this is at sufficient depth and short a period to pose no limitation to crop growth.

B. SOIL RESOURCES

Three soil types occur in the site. All are derived from fluvioglacial drift and correspond to two series of the Blackwood Association. The majority of the soil is of the Arrow series with a small area of lighter topsoils that correspond to the Blackwood series. A further small area with finer textured topsoil found on Claypit Plantation is probably derived from ditch cleaning material.

Topsoil and subsoil resources are shown in the accompanying maps together with soil depths and approximate volumes. A full profile description of the major soil type is given in Annex 1. Clay was not found at any of the auger boring points but was encountered at 80 cm on the pit profile. From the gley morphology of the subsoils and evidence in the drainage ditches it is believed that clay forms a slowly permeable horizon over much of the survey area at a little below 120 cm.

Topsoil

Topsoils are separated as follows:

Units T1, T4A and T4B

Stoneless well drained loamy medium sand. The three units signify three different depths. Unit T1 on Claypit Plantation is relatively deep with a mean depth of 43 cm.

Units T2, T5A, T5B

These consist of well drained medium sandy loams which may be slightly stony (up to 5%). The median depths of these units are 40 cm, 30 cm and 35 cm respectively.

Unit T3

This is a small strip of stoneless fine sandy clay loam. The positioning adjacent to a drainage ditch suggests that it is derived from ditch cleanings. Mean depth of this unit is 43 cm.

Subsoil

All the subsoil units are of a very light texture being predominantly medium textured sand. There are areas where an upper subsoil of loamy medium sand occur but these account only for 5% of subsoil volume. This upper subsoil may be stony and sieving at the soil inspection pit recorded a 40% stone content between 35 and 60 cm depth. These stones are predominantly chalk with a low percentage of small flints. Although there is evidence of gleying in the subsoil they are considered to be well drained down at least to one metre.

2. AGRICULTURAL LAND CLASSIFICATION

Land quality assessments have been made using the revised guidelines and criteria for grading agricultural land published by MAFF in October 1988. These came into effect in January 1989.

The following grades have been recorded

Grade	Claypit Plantation	Access Road
3a	8.5 ha (87%)	0.43 ha (64%)
3b	1.3 ha (13%)	0.24 ha (36%)
	9.8 ha	0.67 ha

Subgrade 3a

These soils consist of sandy loams or rarely sandy clay loams over medium sand with an occasional upper subsoil of loamy sand that may be very stony. They are well drained and classified as Wetness Class 1. Although easily worked, their relatively coarse texture and stone content in combination with rainfall and temperature make them moderately droughty and thus limited to this sub-grade.

Subgrade 3b

The remainder of the survey area consists of loamy sands over medium sand. These soils are well drained, Wetness Class 1 but have a limited waterholding capacity. Local climatic conditions make these soils very droughty and therefore limited to this sub-grade.

ANNEX 1

SOIL PROFILE DESCRIPTION

Crop: winter cereal
Slope: 0°
Weather: Cool, bright, dry
Grid ref: SE88667700

Depth cm

0-35 Dark yellowish brown (10YR3/4) medium sandy loam; unmottled; very slightly stony (2%) small angular flints; moist; moderately developed medium subangular blocky; medium packing density; very porous; few fine macropores and fissures; moderately weak soil strength; non sticky; slightly plastic; common very fine fibrous roots; slightly calcarerous; sharp smooth boundary.

35-60 Brown (10YR5/3) loamy medium sand; many medium prominent clear stony brown (7.5YR5/6) mottles; very stony with many small angular flints and chalk stones; very moist; very weakly developed medium to fine subangular blocky structure; low packing density; extremely porous; very weak soil strength; non sticky; non plastic; few fine fibrous roots; slightly calcareous; abrupt wavy boundary.

60-80 Brown (10YR4/3) medium sand with dark grey (10YR4/1) root channels; common fine distinct clear yellowish brown (10YR5/6) mottles; stoneless; wet; single grain low packing density; extremely porous; no fissures or macripores; loose; non sticky; non plastic; no roots; non-calcareous; sharp smooth boundary.

80-100 Brown (7.5YR4/2) silty clay; unmottled; stoneless; moist; moderately to strongly developed coarse platey structure; high packing density; very slightly porous; very firm soil strength; very sticky; very plastic; no roots; non-calcareous

ANNEX 2

SCHEDULE OF SOIL AUGER BORINGS

GLOSSARY

SOIL TEXTURES

ms	medium sand
fs	fine sand
lms	loamy medium sand
lfs	loamy fine sand
msl	medium sandy loam
fsl	fine sandy loam
scl	medium sandy clay loam
fscl	fine sandy clay loam
hcl	heavy clay loam
c	clay
zc	silty clay
mcl.h	medium clay loam bordering heavy clay loam
hcl.c	heavy clay loam bordering clay
scl.msl	sandy clay loam bordering medium sandy loam
lms.ms	loamy medium sand bordering medium sand
msl.lms	medium sandy loam bordering loamy medium sand
ms.fs	*medium sand bordering fine sand*

MOTTLES

O	Ochreous
G	Grey

ANNEX 2

AUGER BORINGS FOR CLAY PIT PLANTATION 023/90

BORING	WET CLASS	TEXTURE	TOPSOIL STONES >2	TOPSOIL STONES >6	DEPTH		COLOUR	CaCO3	MOTTLES
001	1	lms			0	32	10YR32		
		ms			32	100	10YR64		common distinct O
002	1	msl			0	30	10YR33		
		lms			30	45	10YR76		common distinct O
		ms			45	100	10YR66		C CO
003	1	lms			0	32	10YR32		
		lms			32	60	10YR42		common distinct O
		msl			60	75	10YR52		few faint O
		ms			75	100	10YR63		
004	1	lms			0	30	10YR32		
		msl			30	40	10YR64		common distinct OG
		lms			40	60	10YR64		common prominent OG
		ms			60	100	10YR52		few distinct O
005	0	msl			0	30	10YR32		
		lms			30	45	10YR66		few distinct O
		ms			45	80	10YR68		
		scl			80	100	75YR42		few distinct O
006	1	lms			0	30	10YR32		
		msl			30	50	10YR53		D distinct OG
		scl			50	60	10YR53		common distinct OG
		ms			60	100	10YR66		
007	1	lms			0	35	10YR32		
		lms			35	75	10YR56		few faint O
		ms.lms			75	100	10YR66		few OF
008	1	msl			0	30	10YR32		
		msl			30	45	10YR53		few distinct O
		lms			45	55	10YR66		few faint O
		ms			55	100	10YR66		few faint O
009	4	msl			0	35	10YR32		
		lms			35	45	10YR53		common distinct OG
		hcl			45	75	75YR42		many prominent OC
		c			75	100	75YR50		common prominent

AUGER BORINGS FOR CLAY PIT PLANTATION 023/90

BORING	WET CLASS	TEXTURE	TOPSOIL STONES >2	TOPSOIL STONES >6	DEPTH		COLOUR	CaCO3	MOTTLES
010	1	msl			0	30	10YR33		
		ms			30	100	10YR52		common distinct O
		xxx			100	100	XXX		
011	1	msl			0	35	10YR33		
		ms			35	100	10YR52		common distinct OG
012	1	msl			0	35	10YR33		
		ms			35	60	10YR63		
		ms			60	100	10YR54		few distinct G
013	1	msl			0	28	10YR32		
		lms			28	55	10YR43		common prominent R
		ms			55	75	10YR43		common prominent R
		ms			75	100	10YR41		few faint G
014	1	lms			0	40	10YR33		
		ms			40	60	25Y74		common prominent R
		ms			60	100	25Y72		few faint O
015	1	lms			0	35	10YR32		
		ms			35	70	25Y76		many distinct OR
		ms			70	100	10YR44		common distinct OG
016	1	lms			0	35	10YR32		
		ms			35	60	25Y74		common prominent R
		ms			60	100	10YR72		common distinct OG
017	1	lms			0	30	10YR33		
		lms			30	80	10YR62		common distinct OG
		scl			80	100	10YR53		common distinct OGM
018	1	lms			0	35	10YR33		
		msl			35	80	10YR52		common distinct OG
		ms			80	100	10YR62		few faint O
019	1	lms.msl			0	35	10YR33		
		ms			35	60	10YR62		common distinct OG
		lms			60	100	10YR53		common distinct OG

AUGER BORINGS FOR CLAY PIT PLANTATION 023/90

BORING	WET CLASS	TEXTURE	TOPSOIL STONES >2	TOPSOIL STONES >6	DEPTH		COLOUR	CaCO3	MOTTLES
020	1	msl			0	35	10YR33		
		lms			35	45	10YR53		common distinct OG
		ms			45	100	10YR5		few faint O
021	1	lms			0	35	10YR33		
		lms			35	80	10YR53		common distinct OG
		ms			80	100	10YRUX		few faint O
022	1	msl			0	30	10YR32		
		lms			30	100	10YR63		many distinct OG
023	1	msl			0	40	10YR32		
		scl			40	50	10YR52		few faint O
		ms			50	100	10YR62		common faint O
024	1	msl			0	35	10738		
		lms			35	50	10YR62		common faint O
		ms			50	100	10YR62		few faint O
025	1	msl			0	35	10YR33		
		ms			35	100	10YR52		many faint O
026	1	msl			0	40	10YR33		
		ms			40	80	10YR53		common faint O
		lcs			80	100	10YR56		
027	1	msl			0	40	10YR33		
		msl			40	50	10YR53	Y	common faint O
		ms			50	100	10YR44		
028	1	msl			0	35	10YR33		
		lms			35	60	10YR53	Y	common distinct O
		lms			60	100	10YR53		common distinct OG
029	1	msl			0	40	10YR33		
		ms			40	100	10YR52		few faint O
030	1	msl			0	35	10YR32		
		ms			35	100	10YR52		common faint O

AUGER BORINGS FOR CLAY PIT PLANTATION 023/90

BORING	WET CLASS	TEXTURE	TOPSOIL STONES >2	TOPSOIL STONES >6	DEPTH		COLOUR	CaCO3	MOTTLES
031	1	msl			0	35	10YR33		
		ms			35	95	10YR53		common faint O
		ms			95	100	10YR52		common faint OG
032	1	msl			0	40	10YR33		
		msl			40	50	10YR53		few distinct O
		lms			50	100	25342		few distinct O
033	1	msl			0	40	10YRYY	Y	
		msl			40	60	10YR53		few faint O
		lms			60	100	10YR53		few faint O
034	1	msl			0	43	10YR32		
		lcs			43	60	10YR52		O
		cs			60	100	10YR53		few distinct O
035	1	msl			0	37	10YR33		
		lms.s			37	60	10YR52		few distinct O
		lms			60	100	10YR52		few distinct O
036	1	msl			0	40	10YR34		
		lms			40	50	10YR54		few distinct O
		lms			50	100	10YR52		few distinct O
037	1	msl			0	37	10YR34		
		lms			37	50	10YR54		few distinct O
		ms			50	100	75YR60		
038	1	lms			0	40	10YR32		
		ms			40	60	10YR52		
		ms			60	100	10YR41		few prominent R
039	1	msl			0	35	10YR42		
		msl			35	65	10YR56		
		ms			65	100	10YR54		
040	1	msl			0	35	10YR43		
		msl			35	60	10YR54		
		ms			60	100	10YR44		

AUGER BORINGS FOR CLAY PIT PLANTATION 023/90

BORING	WET CLASS	TEXTURE	TOPSOIL STONES >2	TOPSOIL STONES >6	DEPTH		COLOUR	CaCO3	MOTTLES
041	1	fscl			0	40	10YR33		
		ms			40	60	10YR52		
		ms			60	100	N4		
042	1	fscl			0	30	10YR44		
		mcl			30	50	10YR44		
		mscl			50	80	10YR54		
		mls			80	100	N4		
043	1	lms			0	45	10YR34		
		lms			45	70	10YR53		
		ms			70	120	10Y53		common distinct 0
044	1	msl			0	45	10YR44		
		ms			45	60	10YR52		common distinct 0
		ms			60	100	N4		
131	1	msl			0	40	10YR32		
		ms			40	100	10YR42		common distinct 0G

MAPS