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51/95

**NORTH WILTSHIRE LOCAL PLAN
CHIPPENHAM
AGRICULTURAL LAND CLASSIFICATION**

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NORTH WILTSHIRE LOCAL PLAN

CHIPPENHAM

AGRICULTURAL LAND CLASSIFICATION SURVEY

SUMMARY

The survey was carried out by ADAS on behalf of MAFF as part of its statutory role in the preparation of the North Wiltshire Local Plan. The fieldwork at Chippenham was completed at a semi-detailed level in November 1995 at a scale of 1:10,000. Data on climate, soils, geology and from previous Agricultural Land Classification (ALC) Surveys was used and is presented in the report. The distribution of grades is shown on the accompanying ALC map at 1:20,000 scale and is summarised below. Results from adjacent detailed level surveys at Showell Nurseries and Melbourne Farm (ADAS, 1993), Easton Lane and Rowden Lane (ADAS, 1994a), Hill Corner Road (ADAS, 1994 b) and Showell Farm Crematorium (ADAS, 1995) are also shown on the accompanying ALC map. Information is correct at this scale but could be misleading if enlarged.

Distribution of ALC grades: Chippenham

Grade	Area (ha)	% of Survey Area	% of Agricultural Land (595.8ha)
1	34.3	5.4	5.8
2	102.6	16.0	17.2
3a	93.6	14.6	15.7
3b	361.7	56.4	60.7
Agricultural Land Not Surveyed	3.6	0.6	0.6
Other Land	44.7	7.0	-
Total	640.5	100.0	100.0

Almost 40% of the agricultural land surveyed at Chippenham was found to be 'best and most versatile'. The areas of Grade 1 and 2 land consist of deep clay loams and sandy clay loams which are relatively well drained. Within the Subgrade 3a mapping units, which have moderate wetness limitations, there are also isolated areas of well drained land and areas with a moderate drought limitation. Most of the Subgrade 3b land has a moderate wetness limitation and consists of deep clays with poorly drained subsoils. The exception is the shallow area land on either side of the railway in the southern block which has a moderate drought limitation. A small area of land near Melbourne Farm has not been surveyed because access was not granted.

The data from these previous surveys are presented in their own reports and this report details only the findings of the most recent work.

1. INTRODUCTION

A semi-detailed Agricultural Land Classification (ALC) Survey was carried out in October and November 1995 at Chippenham on behalf of MAFF as part of its statutory role in the preparation of the North Wiltshire Local Plan. The most recent 1995 fieldwork covering 516.4 ha of land was conducted by ADAS at a scale of 1:10,000 with approximately one auger boring per two hectares of agricultural land. A total of 233 auger borings were examined and 12 soil profile pits used to assess subsoil conditions.

The published provisional one inch to the mile ALC map of this area (MAFF 1973) shows the grades of the site at a reconnaissance scale only. This shows most of the land around Chippenham to be Grades 2 and 3. The grade 2 land is mapped on the north eastern southern sides. A small area of Grade 1 land is mapped to the south of Showell Farm and Grade 4 land is shown either side of the River avon.

The area was also surveyed in 1978 and 1984 at a scale of 1:25,000 (ADAS; 1978, 1984). These maps show similar trends in the quality of the land. The trend in quality within the subdivided Grade 3 land in each block is for the quality to decrease towards the south west.

The recent survey supersedes the 1973, 1976 and 1984 maps having been carried out at a more detailed level and using the Revised Guidelines and Criteria for grading the quality of agricultural land (MAFF, 1988). These guidelines provide a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use. The grading takes account of the top 120 cm of the soil profile. A description of the grades used in the ALC system can be found in Appendix 2.

2. CLIMATE

The grade of the land is determined by the most limiting factor present. The overall climate is considered first because it can have an overriding influence on restricting land to a lower grade despite other favourable conditions.

Estimates of climatic variables were interpolated from the published agricultural climate dataset (Meteorological Office, 1989). The parameters used for assessing overall climate are accumulated temperature, a measure of the relative warmth of a locality, and average annual rainfall, a measure of overall wetness. The results shown in Table 1 indicate there is no overall climatic limitation.

Table 1: Climatic Interpolations: Chippenham

Grid Reference		ST 903 718	ST 916 708	ST 917 727
Altitude (m)		72	45	48
Accumulated Temperature (day °)		1461	1491	1487
Average Annual Rainfall (mm)		766	736	743
Overall Climatic Grade		1	1	1
Field Capacity Days		172	167	168
Moisture deficit (mm):	Wheat	100	105	105
	Potatoes	91	98	98
Grid Reference		ST 939 736	ST 929 743	ST 931 72
Altitude (m)		60	70	45
Accumulated Temperature (day °)		1473	1461	1490
Average Annual Rainfall (mm)		756	766	740
Overall Climatic Grade		1	1	1
Field Capacity Days		168	170	166
Moisture deficit (mm):	Wheat	103	101	106
	Potatoes	95	93	99

Climatic data on Field Capacity Days (FCD) and Moisture Deficits for wheat and potatoes are also shown. These data are used in assessing the soil wetness and droughtiness limitations referred to in later sections.

3. RELIEF AND LANDCOVER

The topography of a site will influence the use of agricultural machinery and hence the cropping potential of the land. Gradient is the most significant aspect which affects the mechanised farm operations since most farm machinery operates best on level ground. Guidelines drawn up for the grading of land on its gradient show that 'best and most versatile' land can not have a gradient of more than 7°.

The land to the west of the railway has a low point of 53 m Above Ordnance Datum (AOD), where the land is flat, before rising to 75 m AOD near Hunters Moor. There are some slopes with gradients of up to 11° here. At the time of the survey most of the fields were under permanent pasture but were a few being used for cereal cultivation.

The land between the railway and Patterdown and the River Avon is gently undulating with gradients of less than 8°. There is a low point of 41 m AOD near Lower Hodge Farm and high points of 60 m AOD near Thingley Junction and Elmtree Farm. There are notable breaks in slope coming up from the River Avon flood plain and again to the west of Rowden Farm and north of Patterdown Range. At the time of the survey all of the land was being used as ley and permanent pasture with some cereal cultivation.

The land to the east of the town in the northern block has three distinct landforms. The land to the west of the River Avon rises from 46 m AOD to 72 m AOD with slopes of up to 11° in places. To the east of the River Avon there is the flat flood plain of the Rivers Avon and Marden before the land rises gently up to 60 m AOD at New Leaze Farm and 65 m AOD along the A4. The land in this block was being used as permanent pasture, and for cereal and maize cultivation.

4. GEOLOGY AND SOILS

The geology of the site is shown on the published 1:50,000 scale solid and drift geology map, (Institute of Geological Sciences, 1990). The south west corner of the southern block is underlain by Combrash (rubbly Oolitic Limestone). The higher and sloping ground is underlain by Kellaways Clay (silty clay with sand lenses) while the flatter areas around Rowden Farm, and between Melbourne Farm and Showell Farm and the River Avon are underlain by variable gravel and alluvium. There is a narrow band of Kellaways Clay mapped along the sharp break of slope just above the River Avon.

The land to the west of the River Avon in the northern block is mainly underlain by Kellaways Sands. To the east of the River Avon, on the flood plain, is an area of variable gravel and alluvium while the slightly higher land around New Leaze Farm and from Harden's Farm to Stanley Lane is underlain by Kellaways Clay.

The soils were mapped by the Soil Survey of England and Wales in 1983 at a reconnaissance scale of 1:250,000 and in 1974 at a scale of 1:63,360. The soils shown on the soil series map are variable. The south west corner of the southern block is shown to consist of soils from the Sherborne Series which are shallow, well drained, fine loamy to clayey over Jurassic Limestone. The higher ground around Hunters Moon, Patterdown and the Chippenham Hospital has soils which are fine loamy over clayey, over Jurassic clays, from the Hardenhuish Series. The flood plain of the River Avon has poorly drained fine loamy to clayey soils over river alluvium from the Wyre Series. A small area of land to the south west of Showell Farm has been mapped as the Tetbury Series which are well drained loamy over clayey soils over inter-bedded Jurassic sandy limestone and clay. Between the River Avon's flood plain and the higher ground on the edge of the survey area the land is

mapped as belonging to the Sutton Series which are loamy soils over limestone gravel and river drift.

The land between the railway and the River Avon in the northern block is mapped as the Langley Series which has well drained loamy soils over inter-bedded sand and clay (Kellaways Beds). Immediately adjacent to the River Avon and along the break of slope to the west of New Leaze Farm and at Harden's Farm narrow bands of soil from the Badsey Series are mapped. These consist of loamy soils over limestone gravel and river drift or Head. The flood plain adjacent to the River Avon is again mapped as belonging to the Wyre Series. However, the flood plain adjacent to the River Marden is shown to consist of soils from the Isle Abbots Series which are loamy soils over Head or river drift over gravel and/or Jurassic clays. The land running from New Leaze Farm to the A4 is mapped as the Hardenhuish Series. The remainder of this block to the east of New Leaze Farm and to the north of Stanley is mapped as containing poorly drained clayey soils over Jurassic clay from the Denchworth Series.

The soils found during the recent survey were also variable. The broad trends found were similar to those described by the Soil Survey of England and Wales but within the soil units a mixture of profiles were found, for example well drained clayey loamy profiles were found in an area that was overall poorly drained. The south west area of the southern block is well drained but shallow over limestone. The land along the flood plain in both blocks is poorly drained and clayey although because of the high channel sides there are better drained areas adjacent to the rivers. The land to the north of Rowden Farm is deep, well drained and contains a negligible amount of stones. This is very similar to the land in the northern block between the railway and the River Avon. The rest of the land in the survey area consists of deep, poorly drained clay loams and clays over clay subsoils. There was some variation within the porosity of these subsoils.

5. AGRICULTURAL LAND CLASSIFICATION

The distribution of ALC grades for the most recent survey is shown in Table 2 and included on the accompanying ALC map. This information could be misleading if shown at a larger scale. The data from the previous surveys are presented in their own reports and only the findings of the most recent survey are detailed here.

Table 2: Distribution of ALC grades: Chippenham

Grade	Area (ha)	% of Survey Area	% of Agricultural Land (482.3 ha)
1	21.3	4.1	4.4
2	62.3	12.1	13.0
3a	78.8	15.3	16.3
3b	316.3	61.3	65.6
Agricultural land not surveyed	3.6	0.7	0.7
Other land	34.1	6.5	-
Total	516.4	100.0	100.0

Grade 1

The land mapped as Grade 1 in the recent survey has no limitation to its agricultural use. The profiles typically have medium clay loam topsoils over clay subsoils, although in places these may be a heavy clay loam or heavy silty clay loam horizon below the topsoil. Although the profiles have gleying starting below 40 cm the clay subsoils are too porous to be slowly permeable layers. These profiles were therefore assessed as Wetness Class I (see Appendix 3).

Grade 2

There are three Grade 2 mapping units. The largest is between the railway and the River Avon in the northern block. The profiles in this unit show evidence of restricted drainage. They have gleying starting above 40 cm with slowly permeable layers starting below 45 cm, and gleying starting above 40 cm with slowly permeable layers starting below 60 cm. Both types of profile were assessed as Wetness Class II which with the medium sandy loam topsoils give a minor wetness limitation. Included in this mapping unit are some scattered Subgrade 3b profiles where the slowly permeable layer starts higher up and were therefore assessed as Wetness Class IV with a moderate wetness limitation. A few other profiles which had no restriction to their drainage and are Grade 1 are also included.

The area of Grade 2 land in the southern block on the higher ground overlooking Melbourne Farm has a minor workability limitation. These profiles are well drained and were assessed as Wetness Class II. The limitation is caused by the medium clay loam topsoils in conjunction with the local FCD value. The Grade 2 unit around Melbourne Farm itself is on the border between Wetness Classes II and III. The profiles are gleyed below 40 cm and have slowly permeable subsoils which on average start just below 60 cm. There is a gradual change in the porosity between the porous and low porosity horizons at this depth. These profiles have been mapped as Grade 2 as they are similar to the profiles from the adjacent previous survey.

Subgrade 3a

The two large areas of Subgrade 3a in the northern block are variable in nature due to the underlying geology. This land has a moderate wetness limitation with the profiles being gleyed below 40 cm and slowly permeable layers starting just above 60 cm. The profiles are therefore just Wetness Class III but are close to Wetness Class II. Included within the units are isolated profiles with much better drainage which have been graded individually as Grades 1 and 2. It was not possible to map these areas at the current level of survey.

In the southern block the land to the east of Rowden Farm has slightly better drainage than the rest of the flood plain because of the deep river channel. The profiles are gleyed below 40 cm and the clay subsoils only become slowly permeable at 70 cm. They were assessed as Wetness Class II and with their heavy clay loam topsoils have a moderate wetness limitation. The land mapped as Subgrade 3a at Hunters Moon, to the west of the railway, is gleyed above 40 cm and has slowly permeable subsoils starting at 40 cm. These profiles were assessed as Wetness Class IV but because of their medium sandy loam topsoils they are mapped as Subgrade 3a. A small area within this mapping unit has slightly better drainage and only suffers from minor wetness limitations.

Subgrade 3b

The land to the east of the River Avon in the northern block is all relatively uniform having a moderate wetness limitation. The profiles are all either Wetness Class III or IV and have heavy clay loam and clay topsoils. Where the profiles are either not gleyed or are gleyed below 40 cm and have slowly permeable subsoils starting above 60 cm they were assessed as Wetness Class III. Where there was gleying above 40 cm and slowly permeable subsoils starting above 48 cm they were assessed as Wetness Class IV. In most of these cases the slowly permeable layers started immediately below the topsoil.

The two small areas of Subgrade 3b land to the west of the River Avon have moderate limitations imposed by their gradient and micro-relief. The gradients of up to 11° restrict the safe use of some agricultural machinery and the micro-relief would hinder the safe and accurate use of some machinery.

In the southern block there are two main types of Subgrade 3b profile. The land to the east of the A350 and the field opposite Showell Nurseries is very similar to the land in the northern block. It has also been assessed as Wetness Class IV, and in a few places Wetness Class III, and with heavy clay loam and clay topsoils has a moderate wetness limitation. However, the sloping land above

Patterdown Range and the flatter land to the east of the Range does include isolated areas which have slightly better drainage and a few Subgrade 3a profiles.

The flat land between Showell Farm and the railway and to the west of the railway lies over the Combrash limestone. These profiles are well drained and assessed as Wetness Class I but are shallow. They have stone contents by volume of Oolitic limestone of 23% and more than 70% in the topsoil and subsoil respectively. In places there may be a transitory upper subsoil which had a stone content of 57% by volume measured. These stones cause a moderate drought limitation and in places a moderate stoniness limitation in the topsoil.

The sloping land to the south and east of Hunters Moon has a moderate limitation due to its gradient. This was measured as being up to 11° which restricts the safe use of some agricultural machinery.

Other Land

This includes all land that is not in agricultural use and a couple of fields which were not surveyed owing to access not being granted.

H Lloyd Jones
Resource Planning Team
Taunton Statutory Unit
November 1995

APPENDIX 1

REFERENCES

ADAS RESOURCE PLANNING TEAM, (1978) *Agricultural Land Classification Survey of Chippenham*. Scale 1:25 000, Reference 10, ADAS Bristol.

ADAS RESOURCE PLANNING TEAM, (1984) *Agricultural Land Classification Survey of Chippenham*. Scale 1:25 000, Reference 9, ADAS Bristol.

ADAS RESOURCE PLANNING TEAM, (1993) *Agricultural Land Classification Survey of Showell Nurseries and Melbourne Farm, Chippenham*. Scale 1:10 000, Reference 71/93, ADAS Bristol.

ADAS RESOURCE PLANNING TEAM, (1994a) *Agricultural Land Classification Survey of Easton Lane and Rowden Lane, Chippenham*. Scale 1:10 000, Reference 64/94, ADAS Bristol.

ADAS RESOURCE PLANNING TEAM, (1994b) *Agricultural Land Classification Survey of Hill Corner Road, Chippenham*. Scale 1:10 000, Reference 66/94, ADAS Bristol.

ADAS RESOURCE PLANNING TEAM, (1995) *Agricultural Land Classification Survey of Showells Farm Crematorium, Chippenham*. Scale 1:10 000, Reference 4/95, ADAS Bristol.

HODGSON, J M (Ed) (1974) *Soil Survey Field Handbook, Technical Monograph No 5*. Soil Survey of England and Wales, Harpenden.

HODGSON, J M (In preparation) *Soil Survey Field Handbook*, Revised edition.

INSTITUTE OF GEOLOGICAL SCIENCES (1990) *Sheet 265, Bath 1:50,000*, Solid and Drift Edition, IGS London.

MAFF (1973) *Agricultural Land Classification Map, Sheet 157*, Provisional 1:63,360 scale.

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

METEOROLOGICAL OFFICE (1989) *Climatological Data for Agricultural Land Classification*. Meteorological Office, Bracknell.

SOIL SURVEY OF ENGLAND AND WALES (1974). *Sheet 251 and 265, Soils of the Southern Cotswolds*, 1:63,360 Scale. SSEW, Harpenden.

SOIL SURVEY OF ENGLAND AND WALES (1983) *Sheet 5, Soils of South West England*, 1:250 000 scale. SSEW, Harpenden.

SOIL SURVEY OF ENGLAND AND WALES (1984) *Soils and Their Use in South West England, Bulletin No 14*. SSEW, Harpenden.

APPENDIX 2

DESCRIPTION OF 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 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 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 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.

Descriptions of other land categories used on ALC maps

Urban

Built-up or 'hard' uses with relatively little potential for a return to agriculture including: housing, industry, commerce, education, transport, religious buildings, cemeteries. Also, hard-surfaced sports facilities, permanent caravan sites and vacant land; all types of derelict land, including mineral workings which are only likely to be reclaimed using derelict land grants.

Non-agricultural

'Soft' uses where most of the land could be returned relatively easily to agriculture, including: private park land, public open spaces, sports fields, allotments and soft-surfaced areas on airports/airfields. Also active mineral workings and refuse tips where restoration conditions to 'soft' after-uses may apply.

Agricultural buildings

Includes the normal range of agricultural buildings as well as other relatively permanent structures such as glasshouses. Temporary structures (eg polythene tunnels erected for lambing) may be ignored.

Open water

Includes lakes, ponds and rivers as map scale permits.

Land not surveyed

Agricultural land which has not been surveyed.

Where the land use includes more than one of the above landcover types, eg buildings in large grounds, and where may be shown separately. Otherwise, the most extensive cover type will usually be shown.

Source: MAFF (1988) Agricultural Land Classification of England and Wales (Revised Guidelines and Criteria for Grading the Quality of Agricultural Land), Alnwick.

APPENDIX 3

DEFINITION OF SOIL WETNESS CLASSES

Wetness Class I

The soil profile is not wet within 70 cm depth for more than 30 days in most years.

Wetness Class II

The soil profile is wet within 70 cm depth for 31-90 days in most years or, if there is no slowly permeable layer within 80 cm depth, it is wet within 70 cm for more than 90 days, but not wet within 40 cm depth for more than 30 days in most years.

Wetness Class III

The soil profile is wet within 70 cm depth for 91-180 days in most years or, if there is no slowly permeable layer within 80 cm depth, it is wet within 70 cm for more than 180 days, but only wet within 40 cm depth for between 31 and 90 days in most years.

Wetness Class IV

The soil profile is wet within 70 cm depth for more than 180 days but not within 40 cm depth for more than 210 days in most years or, if there is no slowly permeable layer within 80 cm depth, it is wet within 40 cm depth for 91-210 days in most years.

Wetness Class V

The soil profile is wet within 40 cm depth for 211-335 days in most years.

Wetness Class VI

The soil profile is wet within 40 cm depth for more than 335 days in most years.

Notes: The number of days specified is not necessarily a continuous period. 'In most years' is defined as more than 10 out of 20 years.

Source: Hodgson, J M (in preparation), Soil Survey Field Handbook (revised edition).

SITE NAME Chippenham		PROFILE NO. Pit 1 (ASP 266)	SLOPE AND ASPECT 0°	LAND USE FLW	Av Rainfall: 756 mm ATO: 1473 day °C	PARENT MATERIAL Cornbrash (Rubbly Limestone)	
JOB NO. 51/95		DATE 25/10/95	GRID REFERENCE ST 901 711	DESCRIBED BY PB/HLJ	FC Days: 168 Climatic Grade: 1 Exposure Grade: -	SOIL SAMPLE REFERENCES	

Horizon No.	Lowest Av. Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness: Size, Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Mangan Concs	Structure: Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots: Abundance and Size	Calcium Carbonate Content	Horizon Boundary: Distinctness and form
1	20	MCL	7.5YR44	18% > 2cm 5% < 2cm 23% SLST (S+D)	None	None	-	-	-	-	MF + VF	-	Abrupt Smooth
2	35	HCL	7.5YR56	50% > 2cm 7% < 2cm 57% SLST (S+D)	None	None	WCSAB	Friable	Moderate	Good	CF + VF	-	Gradual Smooth
3	68	HCL	7.5YR56	70% > 2cm 6% < 2cm 76% SLST (S+D)	None	None	-	-	Moderate	Fissued	CF + VF	-	Clear Smooth
4	90+	C	2.5Y74	> 70% SLST (Vis)	CDFO (10YR66)	None	-	-	Moderate	Fissued	FVF	-	-

Profile Gleyed From: 68 cm

Depth to Slowly Permeable Horizon: No SPL

Wetness Class: I

Wetness Grade: 2

Available Water Wheat: 71 mm
Potatoes: 52 mm

Moisture Deficit Wheat: 103 mm
Potatoes: 95 mm

Moisture Balance Wheat: - 32 mm
Potatoes: - 37 mm

Droughtiness Grade: 3b (Calculated to 100 cm)

Final ALC Grade: 3b

Main Limiting Factor(s): Drought and Topsoil Stones

Remarks: > 10% HR > 6cm in t/s.

SITE NAME Chippenham		PROFILE NO. Pit 2 (ASP 31)	SLOPE AND ASPECT 0°	LAND USE Fallow (stubble)	Av Rainfall: 756 mm ATO: 1473 day °C FC Days: 168 Climatic Grade: 1 Exposure Grade: -	PARENT MATERIAL Variable Gravel and Alluvium
JOB NO. 51/95		DATE 31/10/95	GRID REFERENCE ST 942 742	DESCRIBED BY HLJ/PB		SOIL SAMPLE REFERENCES

Horizon No.	Lowest Av. Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness: Size, Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Mangan Concs	Structure: Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots: Abundance and Size	Calcium Carbonate Content	Horizon Boundary: Distinctness and form
1	20	MCL	10YR43	< 1% TOTAL (VIS)	None	None	-	-	-	Good	MF + VF	-	Abrupt Smooth
2	40	C	10YR43	< 1% TOTAL (VIS)	None	None	WCSAB	Friable	Moderate	Good	CF + VF	-	Gradual Smooth
3	57	C	10YR44	< 1% TOTAL (VIS)	None	None	MCP (WCAB)	Friable	Moderate	Good	CVC	-	Gradual Smooth
4	80	C	10YR64/ 53	< 1% TOTAL (VIS)	MDFO + P (75YR56 10YR73)	None	WCPr (breaking to WCAB)	Firm	Poor	Poor (occasional large worm channel)	FVF	-	Clear Smooth
5	100+	C	10YR53	30% HR TOTAL (VIS)	CDFO (10YR68)	Few	WCSAB	Firm	Poor	Poor	-	-	-

Profile Gleyed From: 57 cm

Depth to Slowly Permeable Horizon: 57 cm

Wetness Class: III

Wetness Grade: 3a

Available Water Wheat: 126 mm

Potatoes: 112 mm

Moisture Deficit Wheat: 103 mm

Potatoes: 95 mm

Moisture Balance Wheat: 23 mm

Potatoes: 17 mm

Droughtiness Grade: 2 (Calculated to 120 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): Wetness

Remarks: Close to WCII (Grade 2).

SITE NAME Chippenham		PROFILE NO. Pit 3 (ASP 106)	SLOPE AND ASPECT 3° NW	LAND USE PGR	Av Rainfall: 756 mm ATO: 1473 day °C	PARENT MATERIAL Kellaways Clay (silty clay with sand lenses)
JOB NO. 51/95		DATE 01/11/95	GRID REFERENCE ST 935 730	DESCRIBED BY HLJ/PB	FC Days: 168 Climatic Grade: 1 Exposure Grade: -	SOIL SAMPLE REFERENCES

Horizon No.	Lowest Av. Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness: Size, Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Mangan Concs	Structure: Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots: Abundance and Size	Calcium Carbonate Content	Horizon Boundary: Distinctness and form
1	22	MCL	10YR43	None	CDFOM (75YR58)	None	-	-	-	-	MF, VF	-	Gradual Smooth
2	46	MCL	10YR54	None	CFFO, GM (10YR58 10YR62)	None	WCSAB	Friable	Moderate	Good	CVF	-	Gradual Smooth
3	56	HCL	10YR63	None	CDFOM (10YR58)	None	MCSAB	Friable	Moderate	Good	CVF	-	Clear Wavy
4	80 +	C	25Y52	None	MDMOM (10YR58)	None	MCP _r	Very firm	Poor	Poor	FVF	-	-

Profile Gleyed From: 46 cm

Depth to Slowly Permeable Horizon: 56 cm

Wetness Class: II

Wetness Grade: 2

Available Water Wheat: 135 mm

Potatoes: 112 mm

Moisture Deficit Wheat: 103 mm

Potatoes: 95 mm

Moisture Balance Wheat: 32 mm

Potatoes: 17 mm

Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 2

Main Limiting Factor(s): Wetness

Remarks: Borderline WC II/III (3a).

SITE NAME Chippenham		PROFILE NO. Pit 4 (ASP 104)	SLOPE AND ASPECT 0°	LAND USE PGR	Av Rainfall: 756 mm ATO: 1473 day °C FC Days: 168 Climatic Grade: 1 Exposure Grade: -	PARENT MATERIAL Variable Gravel and Alluvium
JOB NO. 51/95		DATE 01/11/95	GRID REFERENCE ST 932 730	DESCRIBED BY PB/HLJ		SOIL SAMPLE REFERENCES

Horizon No.	Lowest Av. Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness: Size, Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Mangan Concs	Structure: Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots: Abundance and Size	Calcium Carbonate Content	Horizon Boundary: Distinctness and form
1	25	C	10YR42	None	CDMO (7.5YR58)	None	-	-	-	-	MF + VF	-	Gradual Smooth
2	60 +	C	10YR62	None	MDMO (10YR58)	Few	MCP _r (breaking to M+CAB)	Very firm	Poor	Poor	CF + VF	-	-

Profile Gleyed From: Surface	Available Water	Wheat: 124 mm	Final ALC Grade: 3b
Depth to Slowly Permeable Horizon: 25 cm		Potatoes: 101 mm	Main Limiting Factor(s): Wetness
Wetness Class: IV	Moisture Deficit	Wheat: 103 mm	
Wetness Grade: 3b		Potatoes: 95 mm	
	Moisture Balance	Wheat: 21 mm	
		Potatoes: 6 mm	Remarks:
	Droughtiness Grade: 2	(Calculated to 120 cm)	

SITE NAME Chippenham		PROFILE NO. Pit 5 (ASP 136)	SLOPE AND ASPECT 2° North	LAND USE PGR	Av Rainfall: 756 mm ATO: 1473 day °C	PARENT MATERIAL Kellaways Clay (silty clay with sand lenses)
JOB NO. 51/95		DATE 02/11/95	GRID REFERENCE ST 944 728	DESCRIBED BY HLJ/PB	FC Days: 168 Climatic Grade: 1 Exposure Grade: -	SOIL SAMPLE REFERENCES

Horizon No.	Lowest Av. Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness: Size, Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Mangan Concs	Structure: Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots: Abundance and Size	Calcium Carbonate Content	Horizon Boundary: Distinctness and form
1	18	HCL	10YR43	< 1% TOTAL (VIS)	CDFO (10YR68)	None	-	-	-	-	MF + VF	-	Abrupt Wavy
2	60 +	C	10YR62	< 1% TOTAL (VIS)	MDMO (10YR69)	None	MCP _r	Firm	Poor	Poor	CF + VF (ex-ped)	-	-

Profile Gleyed From: 18 cm
Depth to Slowly Permeable Horizon: 18 cm
Wetness Class: IV
Wetness Grade: 3b

Available Water Wheat: 123 mm
Potatoes: 100 mm
Moisture Deficit Wheat: 103 mm
Potatoes: 95 mm
Moisture Balance Wheat: 20 mm
Potatoes: 5 mm
Droughtiness Grade: 2 (Calculated to 120 cm)

Final ALC Grade: 3b
Main Limiting Factor(s): Wetness

Remarks: Top 10 cm of profile is gleyed HCL then possibly 10 cm of porous clay.

SITE NAME Chippenham		PROFILE NO. Pit 6 (ASP 10)	SLOPE AND ASPECT 0°	LAND USE PGR	Av Rainfall: 756 mm ATO: 1473 day °C FC Days: 168 Climatic Grade: 1 Exposure Grade: -	PARENT MATERIAL Kellaways Sands
JOB NO. 51/95		DATE 02/11/95	GRID REFERENCE ST 930 743	DESCRIBED BY PB/HLJ		SOIL SAMPLE REFERENCES

Horizon No.	Lowest Av. Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness: Size, Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Mangan Concs	Structure: Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots: Abundance and Size	Calcium Carbonate Content	Horizon Boundary: Distinctness and form
1	18	MSL	10YR43	< 1% TOTAL (VIS)	CDFO (75YR58)	None	-	-	-	-	MF + VF	-	Gradual Smooth
2	52	MSL	25Y64	< 1% HR TOTAL	CDFO (10YR58)	Common	WCSAB	Friable	Good	Good	CF + VF	-	Gradual Smooth
3	74	SC	25Y63	< 1% HR TOTAL	MDMO (10YR58)	Common	MCPPr	Friable	Moderate	Poor	FVF	-	Clear Wavy
4	100 +	C	25Y62	< 1% HR TOTAL	MDMO (10YR68)	Common	WACPr	Very firm	Poor	Poor	FVF	-	-

Profile Gleyed From: 18 cm
Depth to Slowly Permeable Horizon: 52 cm
Wetness Class: III
Wetness Grade: 2

Available Water Wheat: 142 mm
Potatoes: 115 mm
Moisture Deficit Wheat: 103 mm
Potatoes: 95 mm
Moisture Balance Wheat: 39 mm
Potatoes: 20 mm
Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 2
Main Limiting Factor(s): Wetness

Remarks: Band of 'medium' Mn concretions in H2. H3 variable texture to MSL, with sandier parts being more porous.

SITE NAME Chippenham		PROFILE NO. Pit 7 (ASP 156)	SLOPE AND ASPECT 0°	LAND USE PGR	Av Rainfall: 756 mm ATO: 1473 day °C	PARENT MATERIAL Variable Gravel and Alluvium
JOB NO. 51/95		DATE 02/11/95	GRID REFERENCE ST 917 722	DESCRIBED BY PB/HLJ	FC Days: 168 Climatic Grade: 1 Exposure Grade: -	SOIL SAMPLE REFERENCES

Horizon No.	Lowest Av. Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness: Size, Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Mangan Concs	Structure: Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots: Abundance and Size	Calcium Carbonate Content	Horizon Boundary: Distinctness and form
1	22	MCL	10YR43	< 1% TOTAL	None	None	-	-	-	-	MF + VF	-	Gradual Smooth
2	42	HZCL	10YR44	< 1% TOTAL	None	None	MF + MSAB	Friable	Good	Good	CF + VF	-	Gradual Smooth
3	64	C	10YR54	< 1% TOTAL	FF, FO (10YR56)	Common	MCP _r	Friable	Moderate	Good	CVF	-	Gradual Smooth
4	92	C	10YR53	< 1% TOTAL	MF + DFO (10YR66,58)	Common	MCP _r	Firm	Poor	Good	FVF	-	Clear Smooth
5	110 +	C	10YR64	50% HR TOTAL (VIS)	MFFO (10YR58)	Common	WF + MSAB	Very Friable	Good	Good	None	-	-

Profile Gleyed From: 64 cm
 Depth to Slowly Permeable Horizon: No SPL
 Wetness Class: I
 Wetness Grade: 1

Available Water Wheat: 147 mm
 Potatoes: 125 mm
 Moisture Deficit Wheat: 103 mm
 Potatoes: 95 mm
 Moisture Balance Wheat: 44 mm
 Potatoes: 30 mm
 Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 1
 Main Limiting Factor(s):

Remarks: |

SITE NAME Chippenham		PROFILE NO. Pit 8 (ASP 196)	SLOPE AND ASPECT 0°	LAND USE PGR	Av Rainfall: 756 mm ATO: 1473 day °C FC Days: 168 Climatic Grade: 1 Exposure Grade: -	PARENT MATERIAL Variable Gravel and Alluvium
JOB NO. 51/95		DATE 02/11/95	GRID REFERENCE ST 917 717	DESCRIBED BY PB/HLJ		SOIL SAMPLE REFERENCES

Horizon No.	Lowest Av. Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness: Size, Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Mangan Concs	Structure: Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots: Abundance and Size	Calcium Carbonate Content	Horizon Boundary: Distinctness and form
1	22	C	10YR54	None	None	None	-	-	-	Good	MF, VF	-	Clear Smooth
2	58	C	10YR53	None	None	None	MF, MSAB	Friable	Good	Good	MF, VF	-	Gradual Smooth
3	75	C	10YR63	None	None	None	WCSAB	Friable	Moderate	Good	FVF	-	Clear Smooth
4	100 +	C	25Y63	None	CFFOM (10YR56)	F	WACSAB	Firm	Poor	Poor	FVF	-	-

Profile Gleyed From: 75 cm
Depth to Slowly Permeable Horizon: 75 cm
Wetness Class: II
Wetness Grade: 3b

Available Water Wheat: 153 mm
Potatoes: 132 mm
Moisture Deficit Wheat: 103 mm
Potatoes: 95 mm
Moisture Balance Wheat: 50 mm
Potatoes: 37 mm
Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 3b
Main Limiting Factor(s): Wetness

Remarks: Profile evidence indicates H1 imported, but no topography evidence. Borderline Subgrade 3a.

SITE NAME Chippenham		PROFILE NO. Pit 9 (ASP 252)	SLOPE AND ASPECT 2° North East	LAND USE Ley	Av Rainfall: 756 mm ATO: 1473 day °C	PARENT MATERIAL Cornbrash (Rubbly Limestone)
JOB NO. 51/95		DATE 02/11/95	GRID REFERENCE ST 908 707	DESCRIBED BY PB/HLJ	FC Days: 168 Climatic Grade: 1 Exposure Grade: -	SOIL SAMPLE REFERENCES

Horizon No.	Lowest Av. Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness: Size, Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Mangan Concs	Structure: Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots: Abundance and Size	Calcium Carbonate Content	Horizon Boundary: Distinctness and form
1	24	MCL	75YR54	11% SLST > 2cm (S+) 11% SLST < 2cm (S+D) 22% SLST TOTAL	None	None	-	-	-	-	MF + VF	-	Abrupt Smooth
2	70 +	HCL	75YR56	70% SLST > 2cm (S) 15% SLST < 2cm (S+D) 85% SLST TOTAL	None	None	-	-	M (assumed)	Well fissured	CF + VF	-	-

Profile Gleyed From: Not gleyed

Depth to Slowly Permeable Horizon: No SPL

Wetness Class: I

Wetness Grade: 1

Available Water Wheat: 68 mm
Potatoes: 55 mm

Moisture Deficit Wheat: 103 mm
Potatoes: 95 mm

Moisture Balance Wheat: - 35 mm
Potatoes: - 40 mm

Droughtiness Grade: 3b (Calculated to 120 cm)

Final ALC Grade: 3b

Main Limiting Factor(s): Drought

Remarks: Probed to 95 cm. Roots to 70 cm +. Too stony for a structure in H2.

SITE NAME Chippenham		PROFILE NO. Pit 10 (ASP 202)	SLOPE AND ASPECT 0°	LAND USE Ploughed	Av Rainfall: 756 mm ATO: 1473 day °C	PARENT MATERIAL Variable Gravel and Alluvium	
JOB NO. 51/95		DATE 06/11/95	GRID REFERENCE ST 903 715	DESCRIBED BY HLJ	FC Days: 168 Climatic Grade: 1 Exposure Grade: -	SOIL SAMPLE REFERENCES	

Horizon No.	Lowest Av. Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness: Size, Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Mangan Concs	Structure: Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots: Abundance and Size	Calcium Carbonate Content	Horizon Boundary: Distinctness and form
1	20	HCL	10YR34	< 1% HR (VIS)	CRRC	None	-	-	-	Good	CF + VF	-	Clear Smooth
2	55	C	10YR64	15% HR (VIS)	CDFO (10YR68)	Common	WCSAB	Firm	Poor	Poor	CF + VF	-	Gradual Smooth
3	80 +	C	25Y63	20% HR (VIS)	MDFO (10YR68)	None	WCP (breaking to WCAB)	Firm	Poor	Poor	FVF	-	-

Profile Gleyed From: 20 cm
Depth to Slowly Permeable Horizon: 20 cm
Wetness Class: IV
Wetness Grade: 3b

Available Water Wheat: 124 mm
Potatoes: 101 mm
Moisture Deficit Wheat: 103 mm
Potatoes: 95 mm
Moisture Balance Wheat: 21 mm
Potatoes: 6 mm
Droughtiness Grade: 2 (Calculated to 120 cm)

Final ALC Grade: 3b
Main Limiting Factor(s): Wetness

Remarks:

SITE NAME Chippenham		PROFILE NO. Pit 11 (ASP 186)	SLOPE AND ASPECT 0°	LAND USE Ley	Av Rainfall: 756 mm ATO: 1473 day °C FC Days: 168 Climatic Grade: 1 Exposure Grade: -	PARENT MATERIAL Variable Gravel and Alluvium
JOB NO. 51/95		DATE 06/11/95	GRID REFERENCE ST 912 718	DESCRIBED BY HLJ		SOIL SAMPLE REFERENCES

Horizon No.	Lowest Av. Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness: Size, Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Mangan Concs	Structure: Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots: Abundance and Size	Calcium Carbonate Content	Horizon Boundary: Distinctness and form
1	28	MCL	10YR44	< 1% HR (VIS)	None	None	-	-	-	Good	MF + VF	-	Clear Smooth
2	60	HCL	10YR54	< 1% HR (VIS)	CDFO (10YR66)	Few	MCSAB	Friable	Moderate	Good	CF + VF	-	Gradual Smooth
3	90 +	C	2.5Y63	< 1% HR (VIS)	CDFO (10YR68)	Common	WCAB	Very firm	Poor	Poor	FVF	-	-

Profile Gleyed From: 60 cm

Depth to Slowly Permeable Horizon: 60 cm

Wetness Class: III

Wetness Grade: 3a

Available Water Wheat: 138 mm

Potatoes: 115 mm

Moisture Deficit Wheat: 103 mm

Potatoes: 95 mm

Moisture Balance Wheat: 35 mm

Potatoes: 20 mm

Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): Wetness

Remarks: Borderline WCII/III. SPL slightly higher up than adjacent previous work.

SITE NAME Chippenham		PROFILE NO. Pit 12 (ASP 64)	SLOPE AND ASPECT 3° North	LAND USE Fallow	Av Rainfall: 756 mm ATO: 1473 day °C	PARENT MATERIAL Kellaways Clay (silty clay with sand lenses)
JOB NO. 51/95		DATE 06/11/95	GRID REFERENCE ST 942 737	DESCRIBED BY HLJ	FC Days: 168 Climatic Grade: 1 Exposure Grade: -	SOIL SAMPLE REFERENCES

Horizon No.	Lowest Av. Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness: Size, Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Mangan Concs	Structure: Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots: Abundance and Size	Calcium Carbonate Content	Horizon Boundary: Distinctness and form
1	28	MCL	10YR43	< 1% HR (VIS)	None	None	-	-	-	Good	CF + VF	-	Clear Smooth
2	65	HCL	10YR53/63	< 1% HR (VIS)	CDFO (10YR58)	None	WCSAB	Friable	Moderate	Good	CF + VF	-	Clear Smooth
3	90 +	C	2.5Y63	< 1% HR (VIS)	MDFO (10YR58)	Few	WCP _r (breaking to WCSAB)	Firm	Poor	Poor	FVF	-	-

Profile Gleyed From: 28 cm	Available Water	Wheat: 139 mm	Final ALC Grade: 3a
Depth to Slowly Permeable Horizon: 65 cm		Potatoes: 116 mm	Main Limiting Factor(s): Wetness
Wetness Class: III	Moisture Deficit	Wheat: 103 mm	
Wetness Grade: 3a		Potatoes: 95 mm	
	Moisture Balance	Wheat: 36 mm	
		Potatoes: 21 mm	
	Droughtiness Grade: 1	(Calculated to 120 cm)	Remarks: Pit dug in a field in a 3b mapping unit at farmers request.