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Land at Lydney

Agricultural Land Classification

January 1998

Resource Planning Team
Bristol
FRCA Western Region

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LYDNEY '97

AGRICULTURAL LAND CLASSIFICATION SURVEY

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INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 103.9 ha of land in two sites at Lydney, Gloucestershire. Field survey was based on 94 auger borings and 6 soil profile pits, and was completed in December 1997. During the survey 6 samples were analysed for particle size distribution (PSD).

2. The survey was conducted by the Resource Planning Team of FRCA Western Region on behalf of MAFF in its statutory role in the preparation of Forest of Dean Local Plan.

3. Information on climate, geology and soils, and from previous ALC surveys was considered and is presented in the relevant section. The current survey uses the Revised Guidelines and Criteria for grading the quality of agricultural land (MAFF, 1988) and supersedes any previous ALC survey. Grade descriptions are summarised in Appendix I.

SUMMARY

4. The distribution of ALC grades is shown on the accompanying 1:10 000 scale ALC maps. The detail of information shown at this scale is appropriate to the intensity of field survey but could be misleading if enlarged or applied to small areas. Areas are summarised in the tables below.

Table 1: Distribution of ALC grades: Lydney

Grade	Area (ha)	% Surveyed Area (86.3 ha)
1	7.5	9
2	22.9	26
3a	32.9	38
3b	18.9	22
4	4.1	5
Other land	17.6	-
Total site area	103.9	100

5. Of the agricultural land surveyed 73 % was found to be best and most versatile. The profiles are developed over weathered sandstone which gives variable soil types. Generally they are well drained with varying amounts of sandstone in the profile leading to minor and moderate drought limitations at Grade 2 and Subgrade 3a respectively. Some of the sandstone has weathered to give sandy clay loam and sandy clay subsoils with reduced porosity which can cause minor and moderate wetness limitations in places.

6. Most of the Subgrade 3b and Grade 4 land is limited by gradient.

CLIMATE

7. Estimates of climatic variables for each site were derived from the published agricultural climate dataset "Climatological Data for Agricultural Land Classification" (Meteorological Office, 1989) using standard interpolation procedures. Data for key points around the sites are given in the relevant section.

8. Since the ALC grade of land is determined by the most limiting factor present, overall climate is considered first because it can have an overriding influence by restricting land to a lower grade despite more favourable site and soil conditions. Parameters used for assessing overall climate are accumulated temperature, a measure of relative warmth and average annual rainfall, a measure of overall wetness. The results shown in Tables 2 and 3 indicate that there is no overall climatic limitation.

9. Climatic variables also affect ALC grade through interactions with soil conditions. The most important interactive variables are Field Capacity Days (FCD) which are used in assessing soil wetness and potential Moisture Deficits calculated for wheat and potatoes, which are compared with the moisture available in each profile in assessing soil droughtiness limitations. These are described in later sections.

ALLASTON SITE, LYDNEY

10. Apart from the published regional ALC map (MAFF, 1977), which shows the site at a reconnaissance scale as being urban and Grade 3, the site was previously surveyed in 1982 at a scale of 1:25 000 (ADAS, 1982). This 1982 survey showed the site to be a complicated area of Subgrades 3a, 3b and 3c, with a small area of Grade 2.

11. The 1982 survey was carried out under the published classification system at that time. The system was revised in 1988 and it is to these guidelines that the current survey has been undertaken. Generally similar profiles were found in each survey being well drained, sandy soils with variable stone contents and of variable depth. The revised guidelines give precise criteria for assessing the Wetness Class (see Appendix II) and other aspects of grading the land. There are also precise criteria for the calculation of potential droughtiness which were not available to the 1986 survey. Previously the system had a larger subjective component and also used the surveyors local knowledge and experience.

Climate

12. The data in Table 2 is taken to represent the site.

Relief

13. Altitude ranges from 80 metres at the southern end of the site to 121 metres at the northern end of the site on Driffield Road with gentle and moderate gradients which cause no limitation.

Table 2: Climatic Interpolations: Driffield Road, Allaston

Grid Reference		SO 640 045	SO 640 047
Altitude (m)		110	120
Accumulated Temperature (day °C)		1409	1397
Average Annual Rainfall (mm)		908	915
Overall Climatic Grade		1	1
Field Capacity Days		198	199
Moisture deficit (mm):	Wheat	85	84
	Potatoes	72	70

Geology and Soils

14. The underlying geology of the site is shown on the published geology map (IGS, 1974) as being Brownstones, which are mainly sandstones. The southern part of the site is mapped as being St Maughan's Group sandstones. All of the profiles in the area had weathered sandstone at varying depths.

15. Soils were mapped by the Soil Survey of England and Wales at a reconnaissance scale of 1:250 000 (SSEW, 1983) as being from the Eardiston 1 Association. An area of Bromyard Association soils are mapped to the south of the site.

16. The Eardiston 1 soils are described as being well drained reddish coarse loamy soils over sandstone which may be shallow in places especially on brows. There are also some reddish loamy silty soils over shale and siltstone. Bromyard soils are well drained reddish fine silty soils over shale and siltstone. Some similar soils have slowly permeable subsoils and slight seasonal waterlogging while others are well drained coarse loamy soils over sandstone.

17. Most of the profiles on the site were well drained and shallow over sandstone while in the southern part of the site they were clayey and had slowly permeable subsoils.

Agricultural Land Classification

18. The distribution of ALC grades found by the current survey is shown on the accompanying 10: 000 scale map and areas are summarised in Table 1. The detail of information shown at this scale is appropriate to the intensity of field survey but could be misleading if enlarged or applied to small areas.

Subgrade 3a

19. The area of Subgrade 3a land overlies shallow sandstone. Generally the profiles are well drained and were assessed as Wetness Class I (see Appendix 2). The profiles tend to have medium clay loam topsoils over medium sandy loam subsoils. There are increasing proportions of weathered sandstone culminating in 85 % from below the upper subsoil as shown at Pit 4. The sandy textures and high stone contents reduce the amount of available moisture in the profile and may cause a moderate drought limitation to Subgrade 3a. Most of

the auger borings in the mapping unit were impenetrable below the upper subsoil and it is assumed that they will be similar to Pit 4 from that depth. In isolated places where the sandstone is more weathered and the profiles are deeper they are Grade 2 due to a minor drought limitation.

Subgrade 3b

20. The soils at the bottom of the slope on the southern edge of the site are deeper overlying the weathered sandstone. These profiles have medium clay loam topsoils over heavy clay loam and sandy clay subsoils. There is gleying starting below the topsoil and the lower subsoils are slowly permeable. Depending on the depth at which the slowly permeable layer starts they were assessed as Wetness Classes III or IV. Most of the mapping unit is Wetness Class IV which with medium clay loam topsoil gives a moderate wetness limitation, Subgrade 3b.

WEST SITE, LYDNEY

21. The published regional ALC map (MAFF, 1977) shows the site at a reconnaissance scale as Grade 3 in the north and west, and Grade 2 in the south and east.. A small area of Grade 4 land is mapped along the A40. The site was also previously surveyed in 1982 at a scale of 1:25 000 (ADAS, 1982) and land to the south of the site was surveyed in 1992 (ADAS, 1992). The 1982 survey showed the southern part of the site as Subgrades 2a and 3b, with a small area of Grade 2.

22. The 1983 survey was carried out under the published classification system at that time. The system was revised in 1988 and it is to these guidelines that the current survey has been undertaken. Generally similar profiles were found in each survey being well drained, sandy soils with variable stone contents and of variable depth. The revised guidelines give precise criteria for assessing the Wetness Class (see Appendix II) and and other aspects of grading the land. There are also precise criteria for the calculation of potential droughtiness which were not available to the 1986 survey.

Climate

23. The following data is taken to represent the site.

Table 2: Climatic Interpolations: West Site, Lydney

Grid Reference		SO 626 034
Altitude (m)		50
Accumulated Temperature (day °C)		1478
Average Annual Rainfall (mm)		899
Overall Climatic Grade		1
Field Capacity Days		197
Moisture deficit (mm):	Wheat	93
	Potatoes	83

Relief

24. Altitude ranges from 15 metres at the southern end of the site to 84 metres by Blackrock Farm at the northern end of the site with mainly gentle and moderate gradients which cause no limitation. There are also strongly and moderately steeply sloping gradients in the centre and north east of the site which limit the land to Subgrade 3b and Grade 4.

Geology and Soils

25. The underlying geology of the site is shown on the published geology map (IGS, 1974) as being Brownstones, which are mainly sandstones. The southern part of the site is mapped as being river terrace gravel and there is alluvium to the north of Watery Lane. Most of the profiles in the area had weathered sandstone at varying depths, with some heavier textured and poorly drained profiles in the southern part of the site..

26. Soils were mapped by the Soil Survey of England and Wales at a reconnaissance scale of 1:250 000 (SSEW, 1983) in a complex pattern of Crwbin, Eardiston 1, Newnham, Fladbury 1 and Moretonhampstead Associations. Most of the site consists of Eardiston 1 with Newnham and Fladbury 1 soils in the southern part of the site. Crwbin soils are mapped along the western edge with Moretonhampstead soils on the northern edge.

27. The Eardiston 1 soils are described as being well drained reddish coarse loamy soils over sandstone which may be shallow in places especially on brows. There are also some reddish loamy silty soils over shale and siltstone. Crwbin soils are very shallow and shallow well drained loamy soils over limestone, often on steep slopes. Limestone pavement and other rock exposures may occur. The Newnham Association are well drained reddish coarse and fine loamy soils over gravel, which may be locally deep. Some similar soils may be affected by groundwater. Fladbury 1 soils are stoneless clayey soils, in places calcareous, variably affected by groundwater while Moretonhampstead soils are well drained gritty loamy soils with a humose surface horizon in places.

28. Most of the profiles on the site were similar to the Eardiston 1 and Newnham profiles being well drained over sandstone and gravel. Soils from the Fladbury 1, Crwbin and Moretonhampstead Associations were not recognised in the current survey.

Agricultural Land Classification

29. The distribution of ALC grades found by the current survey is shown on the accompanying 1:10 000 scale map and areas are summarised in Table 1. The detail of information shown at this scale is appropriate to the intensity of field survey but could be misleading if enlarged or applied to small areas.

Grade 1

30. The area of land mapped as Grade 1 near the District Hospital is developed over sandstone. The profiles are well drained and were assessed as Wetness Class I. PSD analysis showed that the topsoils included medium sandy loams so with the local FCD values there is no workability limitation. The lower subsoils were found to be variable in texture because of the way in which the sandstone has been broken down.

Grade 2

31. Most of the site consists of Grade 2 land with minor drought and wetness limitations. The profiles have medium clay loam, medium sandy loam and medium sandy silt loam textures as shown by PSD analysis. The droughty profiles are mainly found over the river terrace gravels either side of the A 48. They have sandy loam topsoils over sandy clay loam subsoils which are porous. At Pit 1, which is representative of this mapping unit, stone contents were seen to increase from 6 % in the topsoil to 25 % and 34 % in the upper and lower subsoil respectively. This will reduce the amount of available moisture in the profile and leads to a minor drought limitation during the growing season. Where the stone contents are not as high there are a few isolated Grade 1 profiles within the mapping unit.

32. The Grade 2 land on either side of Watery Lane and adjacent to Stonebury Wood tends have slightly heavier medium clay loam and sandy clay loam topsoils. The profiles typically have deep, well drained sandy loam subsoils which were assessed as Wetness Class I. With the topsoil textures and the local FCD values this gives a minor workability limitation indicating Grade 2. Isolated Grade 1 profiles occur where the topsoil textures are lighter.

Subgrade 3a

33. The Subgrade 3a land in the southern part of the site mainly has a moderate wetness limitation. They differ from the better drained soils by having reddish clay and sandy clay lower subsoils which are slowly permeable. Gleying was seen in some of the profiles but this was below 40 cm so they were mainly assessed as Wetness Class III. In places the gleying started above 40 cm and the slowly permeable layer was found higher up the profile. These isolated profiles were assessed as Wetness Class IV and are Subgrade 3b.

34. The area of Subgrade 3a either side the B 4231 is a transitional unit between the better drained Grade 1 and 2 land and the poorly drained Subgrade 3b to the north of the road. Included within the unit are Grade 1, Grade 2 and Subgrade 3b profiles which could not be mapped individually at this level of survey.

Subgrade 3b

35. The small area of Subgrade 3b land on the south west side of the District Hospital has moderate droughtiness and soil depth limitations. The profiles are represented by Pit 3 which has a medium sandy loam topsoil over clay loam and clay subsoils. They are well drained and were assessed as Wetness Class I, but stony horizon with 73 % hard rock was found to extend from 18 cm to below 60 cm which would restrict the range and type of cultivation which can be undertaken. The high stone contents also reduce the amount of available moisture within the profile leading to a moderate drought limitation.

36. The sloping Subgrade 3b land in between watery Lane and the B 4231 is downgraded because of strongly sloping gradients of 9-11°. This will restrict the accurate use of some agricultural machinery, thus restricting cropping practises.

Grade 4

37. The Grade 4 land has a severe limitation due to gradient. There are moderately steeply and steeply sloping gradients of 12-17°. This will limit the safe and accurate use of some agricultural machinery, thus restricting cropping practises.

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FRCA Bristol
February 1998

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APPENDIX I

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.

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

APPENDIX II

DEFINITION OF SOIL WETNESS CLASSES

Soil wetness is classified according to the depth and duration of waterlogging in the soil profile.

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 (Ed) (1997) Soil Survey Field Handbook. Soil Survey Technical Monograph No 5, Silsoe.

APPENDIX III

ABBREVIATIONS AND TERMS USED IN SURVEY DATA

Soil pit and auger boring information collected during ALC survey is held on a computer database and is reproduced in this report. Terms used and abbreviations are set out below. These conform to definitions contained in the Soil Survey Field Handbook (Hodgson, 1997).

1. Terms used on computer database, in order of occurrence.

GRID REF: National 100 km grid square and 8 figure grid reference.

LAND USE: At the time of survey

WHT:	Wheat	**SBT:**	Sugar Beet	**HTH:**	Heathland
BAR:	Barley	**BRA:**	Brassicas	**BOG:**	Bog or Marsh
OAT:	Oats	**FCD:**	Fodder Crops	**DCW:**	Deciduous Wood
CER:	Cereals	**FRT:**	Soft and Top Fruit	**CFW:**	Coniferous Woodland
MZE:	Maize	**HRT:**	Horticultural Crops	**PLO:**	Ploughed
OSR:	Oilseed Rape	**LEY:**	Ley Grass	**FLW:**	Fallow (inc. Set aside)
POT:	Potatoes	**PGR:**	Permanent Pasture	**SAS:**	Set Aside (where known)
LIN:	Linseed	**RGR:**	Rough Grazing	**OTH:**	Other
BEN:	Field Beans	**SCR:**	Scrub		

GRDNT: Gradient as estimated or measured by hand-held optical clinometer.

GLEY, SPL: Depth in centimetres to gleying or slowly permeable layer.

AP (WHEAT/POTS): Crop-adjusted available water capacity.

MB (WHEAT/POTS): Moisture Balance. (Crop adjusted AP - crop potential MD)

DRT: Best grade according to soil droughtiness.

If any of the following factors are considered significant, 'Y' will be entered in the relevant column.

MREL:	Microrelief limitation	**FLOOD:**	Flood risk	**EROSN:**	Soil erosion risk
EXP:	Exposure limitation	**FROST:**	Frost prone	**DIST:**	Disturbed land
CHEM:	Chemical limitation				

LIMIT: The main limitation to land quality: The following abbreviations are used.

OC:	Overall Climate	**AE:**	Aspect	**EX:**	Exposure
FR:	Frost Risk	**GR:**	Gradient	**MR:**	Microrelief
FL:	Flood Risk	**TX:**	Topsoil Texture	**DP:**	Soil Depth

CH:	Chemical	**WE:**	Wetness	**WK:**	Workability
DR:	Drought	**ER:**	Erosion Risk	**WD:**	Soil Wetness/Droughtiness
ST:	Topsoil Stoniness				

TEXTURE: Soil texture classes are denoted by the following abbreviations:-

S:	Sand	**LS:**	Loamy Sand	**SL:**	Sandy Loam
SZL:	Sandy Silt Loam	**CL:**	Clay Loam	**ZCL**	Silty Clay Loam
ZL:	Silt Loam	**SCL:**	Sandy Clay Loam	**C:**	Clay
SC:	Sandy clay	**ZC:**	Silty clay	**OL:**	Organic Loam
P:	Peat	**SP:**	Sandy Peat	**LP:**	Loamy Peat
PL:	Peaty Loam	**PS:**	Peaty Sand	**MZ:**	Marine Light Silts

For the sand, loamy sand, sandy loam and sandy silt loam classes, the predominant size of sand fraction will be indicated by the use of the following prefixes:-

F: Fine (more than 66% of the sand less than 0.2mm)
M: Medium (less than 66% fine sand and less than 33% coarse sand)
C: Coarse (more than 33% of the sand larger than 0.6mm)

The clay loam and silty clay loam classes will be sub-divided according to the clay content: **M:** Medium (< 27% clay) **H:** heavy (27 - 35% clay)

MOTTLE COL: Mottle colour using Munsell notation.

MOTTLE ABUN: Mottle abundance, expressed as a percentage of the matrix or surface described.

F: few <2% **C:** common 2 - 20% **M:** many 20 - 40% **VM:** very many 40%+

MOTTLE CONT: Mottle contrast

F: faint - indistinct mottles, evident only on close inspection
D: distinct - mottles are readily seen
P: Prominent - mottling is conspicuous and one of the outstanding features of the horizon.

PED. COL: Ped face colour using Munsell notation.

GLEY: If the soil horizon is gleyed a 'Y' will appear in this column. If slightly gleyed, an 'S' will appear.

STONE LITH: Stone Lithology - One of the following is used.

HR:	All hard rocks and stones	**SLST:**	Soft oolitic or dolimitic limestone
CH:	Chalk	**FSST:**	Soft, fine grained sandstone
ZR:	Soft, argillaceous, or silty rocks	**GH:**	Gravel with non-porous (hard) stones
MSST:	Soft, medium grained sandstone	**GS:**	Gravel with porous (soft) stones

SI: Soft weathered igneous or metamorphic rock

Stone contents are given in % by volume for sizes >2cm, >6cm and total stone >2mm.

STRUCT: The degree of development, size and shape of soil peds are described using the following notation

Degree of development	**WA:**	Weakly developed Adherent	**WK:**	Weakly developed
	MD:	Moderately developed	**ST:**	Strongly developed
Ped size	**F:**	Fine	**M:**	Medium
	C:	Coarse	**VC:**	Very coarse
Ped Shape	**S:**	Single grain	**M:**	Massive
	GR:	Granular	**AB:**	Angular blocky
	SAB:	Sub-angular blocky	**PR:**	Prismatic
	PL:	Platy		

CONSIST: Soil consistence is described using the following notation:

L:	Loose	**VF:**	Very Friable	**FR:**	Friable	**FM:**	Firm
VM:	Very firm	**EM:**	Extremely firm	**EH:**	Extremely Hard		

SUBS STR: Subsoil structural condition recorded for the purpose of calculating profile droughtiness: **G:** Good **M:** Moderate **P:** Poor

POR: Soil porosity. If a soil horizon has poor porosity with less than 0.5% biopores >0.5mm, a 'Y' will appear in this column.

IMP: If the profile is impenetrable to rooting a 'Y' will appear in this column at the appropriate horizon.

SPL: Slowly permeable layer. If the soil horizon is slowly permeable a 'Y' will appear in this column.

CALC: If the soil horizon is calcareous with naturally occurring calcium carbonate exceeding 1% a 'Y' will appear this column.

2. Additional terms and abbreviations used mainly in soil pit descriptions.

STONE ASSESSMENT:

VIS:	Visual	**S:**	Sieve	**D:**	Displacement

MOTTLE SIZE:

EF:	Extremely fine <1mm	**M:**	Medium 5-15mm
VF:	Very fine 1-2mm>	**C:**	Coarse >15mm
F:	Fine 2-5mm		

MOTTLE COLOUR: May be described by Munsell notation or as ochreous (OM) or grey (GM).

ROOT CHANNELS: In topsoil the presence of 'rusty root channels' should also be noted.

MANGANESE CONCRETIONS: Assessed by volume

N:	None		**M:**	Many	20-40%
F:	Few	<2%	**VM:**	Very Many	>40%
C:	Common	2-20%			

POROSITY:

P:	Poor	- less than 0.5% biopores at least 0.5mm in diameter
G:	Good	- more than 0.5% biopores at least 0.5mm in diameter

ROOT ABUNDANCE:

The number of roots per $100cm^2$:		Very Fine and Fine	Medium and Coarse
F:	Few	1-10	1 or 2
C:	Common	10.25	2 - 5
M:	Many	25-200	>5
A:	Abundant	>200	

ROOT SIZE

VF:	Very fine	<1mm	**M:**	Medium	2 - 5mm
F:	Fine	1-2mm	**C:**	Coarse	>5mm

HORIZON BOUNDARY DISTINCTNESS:

Sharp:	<0.5cm	**Gradual:**	6 - 13cm
Abrupt:	0.5 - 2.5cm	**Diffuse:**	>13cm
Clear:	2.5 - 6cm		

HORIZON BOUNDARY FORM: Smooth, wavy, irregular or broken.*
* See Soil Survey Field Handbook (Hodgson, 1997) for details.

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Lydney 1997	Pit 1 (ASP 103)	1° South	Maize	Av Rainfall: 912 mm ATO: 1449 day °C	Alluvium
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 197 Climatic Grade: 1 Exposure Grade: 1	PSD SAMPLES TAKEN
84/97	17/12/97	SO 626 634	HLJ/PB		TS 0-25 cm MSL (*SCL) S:52 Z:31 C:17

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	32	MSL	75YR33	1% > 2 cm (s) 5% < 2 cm (s&d) 6% HR TOTAL	None	None	-	-	-		CF & VF	-	Abrupt Smooth
2	67	SCL	05YR43.44	3% > 2 cm (s) 22% < 2 cm (s&d) 25% HR TOTAL	None	None	MDCSAB	Friable	Moderate	Good	FVF	-	Gradual Smooth
3	105+	SCL	05YR46	3% > 2 cm (s) 31% < 2 cm (s&d) 34% HR TOTAL	FDFO (75YR56)	Common	WKCSAB	Friable	Moderate	Poor	FVF	-	-

Profile Gleyed From: Not gleyed

Slowly Permeable Horizon From: No spl *[1]

Wetness Class: I

Wetness Grade: 1

Available Water Wheat: 121 mm

Potatoes: 95 mm

Moisture Deficit Wheat: 93 mm

Potatoes: 83 mm

Moisture Balance Wheat: 28 mm

Potatoes: 12 mm

Droughtiness Grade: 2 (Calculated to 120 cm)

Final ALC Grade: 2

Main Limiting Factor(s): Drought

Remarks: *[1] H3 is porous due to stone content and gritty coarse sand in the sand fraction although actual biopores are low

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Lydney 1997	Pit 2 (ASP 45)	2° South	Permanent grass	Av Rainfall: 912 mm ATO: 1449 day °C	Sandstone
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 197 Climatic Grade: 1 Exposure Grade: 1	PSD SAMPLES TAKEN
84/97	18/12/97	SO 627 037	HLJ/PB		Topsoil 0-25 MSL S:61 Z:26 C:13

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	30	MSL	0.5YR44	5% HR TOTAL (vis)	None	None	-	-	-	Good	MF + VF	-	Gradual Smooth
2	60	SCL	2.5YR43 (2.5YR44)	5% HR (vis)	None	None	MDVCPR*1	Friable	Poor	Good	CF+VF	-	Gradual Smooth
3	85	MSL*2	2.5YR34,44	5%HR (vis)	None	None	WKCSAB	Friable	Good	Good	CF+VF	-	Clear irregular
4	100+	C	10R34	20% FSST 2% HR (vis)	FFLO +P (75YR56,52)	Few	Massive	Very firm	Poor	Poor*3	FVF	-	-

Profile Gleyed From: Not gleyed

Slowly Permeable Horizon From: 85 cm

Wetness Class: I

Wetness Grade: 1

Available Water Wheat: 134 mm

Potatoes: 102 mm

Moisture Deficit Wheat: 93 mm

Potatoes: 83 mm

Moisture Balance Wheat: 41 mm

Potatoes: 19 mm

Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 1

Main Limiting Factor(s):

Remarks: *1 breaking to WKCSAB
*2 includes LMS & SCL
*3 few large
NB/H4 was at 75 cm on one side of pit WCII

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Lydney 1997	Pit 3 (Nr ASP 65)	3° South West	Permanent grass	Av Rainfall: 912 mm ATO: 1449 day °C	Sandstone
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 197 Climatic Grade: 1 Exposure Grade: 1	PSD SAMPLES TAKEN
84/97	18/12/97	SO 6275 0335	HLJ/PB		Topsoil 0-25 MSL S:54 Z:31 C:15

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	7.5YR33	1%> 2 cm (s) 13% < 2 cm (s+d) 14% HR	None	None	-	-	-	Good	CF + VF	-	Clear Smooth
2	60	MCL	0.5YR43	40% > 2 cm (s) 33%< 2cm (s+d) 73% HR	None	None	MDM+ FSAB	Friable	Good	Good	CF+VF	-	Abrupt Irregular
3	90	C	2.5YR34,44	35%MSST (vis)	None	None	WKCSAB	Firm	Moderate	Good	CF+VF	-	-

Profile Gleyed From: Not gleyed

Slowly Permeable Horizon From: No spl

Wetness Class: I

Wetness Grade: 1

Available Water	Wheat:	66 mm
	Potatoes:	43 mm
Moisture Deficit	Wheat:	93 mm
	Potatoes:	83 mm
Moisture Balance	Wheat:	-27 mm
	Potatoes:	-40 mm

Droughtiness Grade: 3b (Calculated to 120 cm)

Final ALC Grade: 3b

Main Limiting Factor(s): Drought, soil depth

Remarks: HR is sandstone
Field is heavily poached - surface water
H3 close to spl on porosity, but no evidence of wetness
3a on topsoil sotnes 3b/4 on soil depth

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Lydney 1997	Pit 4 (ASP 12)	3° South	Permanent grass	Av Rainfall: 912 mm ATO: 1449 day °C FC Days: 198 Climatic Grade: 1 Exposure Grade: 1	Sandstone
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY		PSD SAMPLES TAKEN
84/97	22/12/97	SO 640 045	HLJ		None

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	26	MCL	7.5YR43	1%> 2 cm (s) 9% < 2 cm (s+d) 10% HR	None	None	-	-	-	Good	MF + VF	-	Clear Smooth
2	33	MSL	7.5YR54	5% > 2 cm (s) 16%< 2cm (s+d) 21% MSST	None	None	MDCSAB	Friable	Moderate	Good	CF+VF	-	Abrupt Smooth
3	65+	MSL	0.5YR43	85%MSST (vis)	None	None	-	-	(Moderate)	-	FVF	-	-

Profile Gleyed From: Not gleyed

Slowly Permeable Horizon From: No spl

Wetness Class: I

Wetness Grade: 2

Available Water	Wheat:	71 mm
	Potatoes:	63 mm
Moisture Deficit	Wheat:	85 mm
	Potatoes:	72 mm
Moisture Balance	Wheat:	-14 mm
	Potatoes:	-9 mm

Droughtiness Grade: 3a (Calculated to 120 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): Drought

Remarks:

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Lydney 1997	Pit 5 (ASP 88)	3° South West	Maize stubble	Av Rainfall: 912 mm ATO: 1449 day °C	Sandstone
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 197 Climatic Grade: 1 Exposure Grade: 1	PSD SAMPLES TAKEN
84/97	22/12/97	SO 624 028	HLJ		Topsoil 0-25 MSZL S:46 Z:38 C:16

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	30	MSZL	75YR44	1%> 2 cm (s) 4% < 2 cm (s+d) 5% HR	None	None	-	-	-	Good	CF + VF	-	Clear Smooth
2	75	MSL	05YR44	1% > 2 cm (s) 2%< 2cm (s) 3% MSST	None	None	MDCSAB	Friable	Moderate	Good	CF+VF	-	Gradual Smooth
3	100+	MSL	05YR64	0% (vis)	None	None	WKCAB	Very Friable	Good	Good	FVF	-	-

Profile Gleyed From: Not gleyed

Slowly Permeable Horizon From: No spl

Wetness Class: I

Wetness Grade: 1

Available Water Wheat: 169 mm

Potatoes: 113 mm

Moisture Deficit Wheat: 93 mm

Potatoes: 83 mm

Moisture Balance Wheat: 76 mm

Potatoes: 30 mm

Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 1

Main Limiting Factor(s):

Remarks:

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Lydney	Pit 6 (ASP 94)	1° South East	Ley	Av Rainfall: 912 mm ATO: 1449 day °C	Alluvium/drift
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 197 Climatic Grade: 1 Exposure Grade: 1	PSD SAMPLES TAKEN
84/97	6/1/98	SO 626 027	PB		TS 0-25 cm MCL/SCL S:50 Z:31 C:19

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	5YR33	2%> 2 cm (vis) 10% < 2 cm (s+d) 12% HR	None	None	-	-	-	-	CM + F	-	Clear Smooth
2	50	SCL	2.5YR44	2% > 2 cm (vis) 14%< 2cm (s+d) 16% HR	None	Few	MDCSAB	Friable	Moderate	Good	CF	-	Gradual Smooth
3	68	SCL	2.5YR54 (5YR64)	2% >2cm (vis) 14%<2cm (s+d) 16% HR	None	None	MDCPR Br to CSAB	Friable	Moderate	Good	CF, VF	-	Gradual Smooth
4	85+	SCL	2.5YR54 (5YR64)	35% >2 cm (s) 22%< 2 cm (s+d) 37% HR MSST	None	None	MDCPR Br to CSAB	Friable	Moderate	Good(low)	FF, VF	-	-

Profile Gleyed From: Not gleyed

Slowly Permeable Horizon From: No spl

Wetness Class: I/II

Wetness Grade: 2

Available Water Wheat: 126 mm

Potatoes: 100 mm

Moisture Deficit Wheat: 93 mm

Potatoes: 83 mm

Moisture Balance Wheat: 29 mm

Potatoes: 15 mm

Droughtiness Grade: 2 (Calculated to 120 cm)

Final ALC Grade: 2/3a (see note)

Main Limiting Factor(s): Workability/Wetness/Drought

Remarks: Auger boring 3m distant showed clay SPL 75-90 cm with CDOM therefore WCII