

# Land West of Barkby Road, Syston



## Agricultural Land Classification

Reference No: 1010117

Issued by: Darren Ingram MIAgrE, MISoilSci

Date: 29<sup>th</sup> March 2018

Submitted to:

RSK Ltd (on behalf of) Taylor Wimpy

Issued by:

ADAS UK Ltd, Rosemaund, Preston Wynne, Herefordshire, HR1 3PG Tel: 01432 820444

# Contents

- 1 Executive Summary.....1**
- 2 Introduction.....2**
- 3 Methodology .....2**
  - 3.1 *Fieldwork* ..... 2
  - 3.2 *The Agricultural Land Classification System*..... 2
- 4 Geology, Soils and Present Land Use .....3**
  - 4.1 *Geology*..... 3
  - 4.2 *Soils*..... 3
  - 4.3 *Present Land Use* ..... 4
  - 4.4 *Previous Agricultural Land Classification Surveys* ..... 4
- 5 Results .....4**
  - 5.1 *Climate*..... 4
  - 5.2 *Site Limitations* ..... 5
  - 5.3 *Soil and Interactive Limitations* ..... 5
  - 5.4 *Land Quality* ..... 6
  - 5.5 *Summary of Land Quality in the Survey Area* ..... 7
- 6 Conclusions.....7**

# Appendices

- Appendix 1: Agricultural Land Classification Maps and Location of Soil Pits and Auger Borings
- Appendix 2: Soil Descriptions
- Appendix 3: Laboratory Analysis
- Appendix 4: Description of the Grades and Subgrades



## Quality Assurance

Author (s)	Checked
<i>Carla Richmond MI Soil Sci</i> <i>Simon McMillan MI Soil Sci</i>	<i>Rosemary Peel</i> <i>BSc (Hons), Dip Env.Pro,</i> <i>BASISs S&amp;W, FACTS</i>

## Disclaimer

Copyright RSK ADAS Ltd. All rights reserved.

No part of this report may be copied or reproduced by any means without prior written consent from RSK ADAS Ltd. If you have received this report in error please destroy all copies in your possession or control and notify RSK ADAS Ltd.

This report has been commissioned for the exclusive use of the commissioning party unless otherwise agreed in writing by RSK ADAS Ltd; no other party may use, make use of or rely on the contents of the report. No liability is accepted by RSK ADAS Ltd for any of this report, other than for the purposes for which it was originally prepared and provided.

Opinions and information provided in this report are on basis of RSK ADAS Ltd using due skill, care and diligence in the preparation of this report and no explicit warranty is provided as to its accuracy. It should be noted that no independent verification of any of the documents supplied to RSK ADAS Ltd has been made.

# 1 Executive Summary

The Agricultural Land Classification of approximately 8.3ha of land lying to the east of Syston, near Leicester, was assessed by ADAS in March 2018.

The site which is proposed for development lies in one block north of Barkby Road. The site is gently sloping and lies at an altitude of about 64m A.O.D. At the time of the survey the site was fallow.

The site is underlain by the Branscombe Mudstone Formation deposits. No superficial deposits are mapped across the site.

An existing detailed Agricultural Land Classification survey had previously been carried out by Natural England on land adjacent to the northern part of the site and to the west and south west of the site. The fieldwork undertaken for this report indicates that the land in the northern and southern parts of the site falls into Grade 2. The land in the middle part of the site is prone to wetness and so falls into Grade 3b.

## 2 Introduction

ADAS was instructed by RSK to undertake an Agricultural Land Classification (ALC) survey on a site at Syston, a village to the north east of Leicester, Leicestershire. The survey was required to inform a planning application for development.

The land was classified using the system outlined in the Ministry of Agriculture, Fisheries and Food (MAFF, now Defra) publication: 'Agricultural Land Classification of England and Wales - Revised guidelines and criteria for grading the quality of agricultural land' (October 1988).

## 3 Methodology

### 3.1 Fieldwork

A desk study of soils and climatic information was undertaken using reference material held by ADAS, followed by detailed fieldwork to study soil and site limitations.

Fieldwork was undertaken with a hand held 50mm diameter "Dutch" auger and/or spade to a depth of 1m. In addition, soil pits were excavated to determine subsoil characteristics which could not be identified from the auger samples.

A total of 12 auger borings and 2 soil pits were examined to determine the quality of the land and the results are shown on the plan at **Appendix 1**. A brief description of the soil pits and auger profiles are given in **Appendix 2**. The results of laboratory analysis for topsoil particle size distribution are shown at **Appendix 3**. The topsoil and upper subsoil were tested with a 10% solution of hydrochloric acid to determine if the soils were calcareous.

The fieldwork was carried out on 6th March 2018 in dry and dull conditions when the soils were wet. The topsoil was sieved at each auger boring location to determine the stone content of the soils and so determines the highest grade possible.

### 3.2 The Agricultural Land Classification System

The ALC system provides a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use. The limitations can operate in one or more of four principal ways.

They may affect:

- the range of crops which can be grown;
- the level of yield;
- the consistency of yield; and

- the cost of obtaining the crop.

The classification system gives considerable weight to flexibility of cropping, whether actual or potential; the ability of some land to produce consistently high yields of a somewhat narrower range of crops is also taken into account.

The principal physical factors influencing agricultural production are climate, site (including relief) and soil. By assessing these factors, it is possible to assign land into one of five land classification grades, Grade 1 land being the highest quality and Grade 5 the lowest quality land. Grade 3 is sub-divided into Grades 3a and 3b, to identify good quality agricultural land from moderate quality land (see **Appendix 4** for a description of the grades used in the ALC system). By considering site specific climate, site and soil factors the land can be classified into 1 of 5 agricultural grades or certain non-agricultural grades, the results of which are detailed in Sections 5.4 and 5.5.

## 4 Geology, Soils and Present Land Use

### 4.1 Geology

The geology map<sup>1</sup> shows the site to be underlain by a solid geology of Branscombe Mudstone Formation, a mudstone bedrock which was laid down in desert conditions 201-228 million years ago in the Triassic Period. The majority of the site does not have a cover of superficial deposits but on the southern boundary Head deposits were laid down 3 million years ago in the Quaternary period and deposits of Birstall sand and gravel, which were deposited 2 million years ago, lie beyond the northern boundary.

### 4.2 Soils

The soils are mapped on the soil maps<sup>2</sup> of the area as Dunnington Heath. These soils are found on gently sloping or lower level slopes and have slightly stony sandy loam topsoil over sandy loam lower subsoil over clayey lower subsoils. On this site topsoils are slightly heavier textured than typical. The soils fall into Wetness Class (WC) 2. In the centre of the site those with clayey subsoils are seasonally wet and fall into WC 4. Wetness classes provide an indication of how wet a soil is, WC 1 is well drained and WC 5 is poorly drained.

Fieldwork for this survey has confirmed the presence of two distinct soil types:

Predominantly sandy clay loam over clay – these soils were located on the slightly higher ground where medium sandy clay loam topsoil overlies clay subsoil. These soils were moderately well drained and fell mainly into WC 2.

---

<sup>1</sup> <http://www.bgs.ac.uk/data/mapViewers/>

<sup>2</sup> SSEW 1983 Soils of Eastern England

Deep heavy clay loams over heavier subsoils – these soils were located on the lower ground in the middle part of the site. They had heavy clay loam topsoil, overlying clay subsoil below 200mm. These soils were poorly drained and fell into WC 4.

### 4.3 Present Land Use

At the time of the survey the site was fallow.

The site is bordered by minor roads to the east and south, by houses to the west and agricultural land lies to the north.

### 4.4 Previous Agricultural Land Classification Surveys

The Provisional ALC maps for the area show the land as an area of Grade 2 land with Grade 3 on the eastern boundary. The Provisional maps only give an indication of land quality over larger areas and should not be relied on for site specific assessment of land quality. In addition, they do not classify land into Subgrades 3a and Subgrade 3b to differentiate between better quality (Subgrade 3a) and lower quality (Subgrade 3b) land.

The Magic website<sup>3</sup> indicates that the site and surrounding land has been surveyed. The land adjacent to the north western boundary is shown as Grade 2 land. Land to the west of the site boundary is shown as a mix of Grade 3a, 3b and non-agricultural land. To the south west of the site the land is mapped as Grade 2.

## 5 Results

The sections below illustrate the main considerations and limitations to the grading of the land.

### 5.1 Climate

The site climatic variables have been interpolated from grid point data surrounding the site, as follows:

**Table 1: Climatic Variables**

Grid Reference	SK637111
Altitude (m)	64
Accumulated Temperature (day °C)	1396
Average Annual Rainfall (mm)	639
Overall Climatic Grade	1
Field Capacity Days	145

<sup>3</sup> magic.defra.gov.uk/

Moisture deficit (mm): Wheat	106
Moisture deficit (mm): Potatoes	97

The site lies on slightly elevated land in the East Midlands and has a mild fairly dry climate. Accumulated Temperature (January–June), a measure of the relative warmth of the area, is 1396°C and the average annual rainfall is 639 mm. Climate does not vary significantly across the site.

This combination of rainfall and temperature indicates that the area is fairly mild and dry, making it good for crop growth so long as the soils hold sufficient water to protect crops against drought and so long as the soils are freely drained and easy to work. There is no overriding climatic limitation to the classification of the land.

## 5.2 Site Limitations

**Slope:** The site lies at an altitude of around 60m on the lowest land in the middle of the site and mainly rises gently towards the south and north to lie at approximately 64m on the southern boundary and around 65m on the northern boundary. The site is gently sloping and gradient is a neutral factor in the classification of the land.

**Flooding:** The site is not affected by flooding from rivers or sea<sup>4</sup>. The closest river lies approximately 465m to the south and the site sits well above the floodplain.

## 5.3 Soil and Interactive Limitations

The limitations of soil wetness and soil drought are determined by the interaction between soil depth, wetness, structure and texture, all of which influence how easy the land is to work, and so have an effect on land quality. In addition, stone content will also have an effect on soil droughtiness. On this site the soils in the north and south are well drained and fall into a mixture of WC 1 and WC 2. The soils are well structured and permeable in the topsoil and upper subsoil, but usually become heavier with depth.

In the middle of the site the land is heavier textured and moderately structured and so has impeded drainage (WC 4), with ochreous mottles and manganese concretions in the upper subsoil sometimes extending into the topsoil and soil wetness is a limiting factor in the classification of the land.

The topsoils and upper subsoils are not calcareous (i.e. there was no reaction when tested with 10% hydrochloric acid).

<sup>4</sup> <http://www.environment-agency.gov.uk/homeandleisure/37793.aspx>



The main factors affecting land quality in this area are:

- A susceptibility to seasonal wetness on the lighter to medium textured soils
- A susceptibility to drought in dry years in the very northern part of the site
- Soil texture coupled with impeded drainage, which affects the workability of the soil on the lower ground

## 5.4 Land Quality

The land quality of the site is shown on the attached plan (**Appendix 1**).

### **Grade 1**

No land has been placed in this grade.

### **Grade 2**

- This Grade has been mapped over 51% of the site.
- The land in this grade has deep sandy clay loams, usually over similar or heavier subsoils. The soils are slightly gleyed and mottled and fall into WC 2.
- Isolated profiles of sandier soils occur at the northern end of the site and these are limited by drought to Grade 2.

This land is capable of producing a wide range of agricultural and horticultural crops.

### **Grade 3a**

No land has been placed in this grade.

### **Grade 3b**

- This Grade has been mapped over 49% of the site.
- The land is low lying and heavy textured. The soils have a wetness limitation and so cannot be graded higher.
- The land in this grade has heavy clay loam topsoil over clay subsoil, with gleying and mottles in the profile. They fall into WC 4.
- This land is capable of producing moderate to high yields of a narrower range of crops (than higher grade land).

### **Grade 4**

No land has been placed in this grade.

### **Grade 5**

No land has been placed in this grade.

### ***Non-agricultural/ urban and woodland***

No land has been placed in these grades.

## 5.5 Summary of Land Quality in the Survey Area

**Table 2: Agricultural Land Classification Measurements**

Grade	Area (ha)	% of Total Area
1	-	-
2	4.2	51
3a	-	-
3b	4.1	49
4	-	-
5	-	-
Farm buildings/infrastructure	-	-
Farm woodland	-	-
<b>Total</b>	<b>8.3</b>	<b>100</b>

## 6 Conclusions

- Fieldwork undertaken for this report recorded soils which had light to medium textured topsoils over similar subsoils and land quality was limited by a wetness limitation to Grade 2. Occasional more sandy profiles were affected by drought.
- On the lower ground in the middle of the site a wetness limitation coupled with heavy soil texture limited land quality to Grade 3b.
- A suitable soil handling strategy should be developed to make effective use of the soils on site to help preserve the soil and retain soil functions such as water and carbon storage.

## Appendix 1

### Agricultural Land Classification Map and Location Plan

(See following page)



## AGRICULTURAL LAND CLASSIFICATION

- × 1-12 Auger Location
- × p1-p2 Pit Location
- Grade 1
- Grade 2
- Grade 3a
- Grade 3b
- Grade 4
- Grade 5
- Land predominantly in urban use.
- Other land primarily in non-agricultural use

26.3.2018	DI	RP	A	AGRICULTURAL LAND CLASSIFICATION
DATE	DRWN	CHKD	REVD	ISSUE

Land off Barkby Lane, Syston

**AGRICULTURAL LAND CLASSIFICATION**

SCALE	1/2,500	MASTER SIZE	A3
DRAWING NO.	1010117/ALC 01	ISSUE	A

CLIENT:

**TAYLOR WIMPEY**



**ADAS**

Rosemaund, Preston Wynne, Hereford, HR1 3PG  
Tel. 01432 820444 Fax. 01432 820121

## Appendix 2: Soil Descriptions

### Keys common to all tables

#### Texture Key

S = sand	F = fine
Z = silt	M = medium
C = clay	C = coarse
L(y) = loam(y)	Pt(y) = peat(y)

#### Structure Key

(V)Wk = (very)weak	M = moderate	S = strong
F = fine	M = medium	C = coarse
SG = single grain	GR = Granular	SAB = subangular blocky
	AB = angular blocky	PR = prismatic

#### Colour key

Br = brown	Bl = black	Yl = yellow
Rd = red	Or = orange	pl = pale
OI = olive	Dk = dark	

#### Main Limitation

DR = Drought	WE = Wetness	CL = Climate
GR = Gradient	MR = Microrelief	TX = Texture

#### Land use

Wht = wheat	perm past = permanent pasture	Osr = oil seed rape
Bar = barley	r&f = ridge and furrow	fal = fallow

#### Others abbreviations

ab = abundant	cons = concretions	imp = impenetrable
MB = moisture balance	Mn = manganese	mot = mottles
occ = occasional/ly	och = ochreous	pok = pockets
pot = potatoes	sat = saturated	
SPL = slowly permeable layer	na = not applicable	CBC = chalky boulder clay
OM = organic matter	rrm = rusty root mottles	

#### CaCO<sub>3</sub> Tests

Topsoils and upper subsoils were tested with a 10% solution of HCl to estimate levels of calcium carbonate in the soil. All soils are non-calcareous unless marked 'calc' i.e. they reacted with an audible or visible fizz.

## PIT DESCRIPTIONS

Pit	Depth (mm)	Colour	Texture	Structure	Drainage/ Porosity (0.5% pores)	Total Stone %
<b>1 (at auger 2)</b>	320	7.5YR33 Dk br	SCL	MCPR-Fm	-	2%
	1160	5YR43 Rd br	SCL	WCSAB - Fr	Gley ped faces + Mn concs / >0.5%	2%
Pit depth 700mm. Augured to 1160mm.						
	Gleyed at: 320	SPL at: -	Wetness class: 2	Wetness grade: 2	Comments:	
		MB wheat: 43 MB pot: 12	DR Grade: 1	Main limitation. Wetness		ALC grade 2

Pit	Depth (mm)	Colour	Texture/	Structure	Drainage/ Porosity (0.5% pores)	Total Stone %
<b>2 (at auger 9)</b>	290	7.5YR43 Br	SCL	MCSAB -Fr	-	5%
	430	7.5YR53 Br	SCL/SC	MCSAB - Fm	Grey ped faces + Och com / >0.5%	3%
	870	7.5YR53 Br	SCL	WkMSAB - Fm -	Och many + Mn concs / >0.5%	3%
	1000	7.5YR61 Gr	HCL	-	Och many + MN concs	
	1100	7.5YR46 St br	SCL		Och many + Mn concs	
Pit depth 600mm. Augured to 1100mm.						
	Gleyed at: 290	SPL at: -	Wetness class: 2	Wetness grade: 2	Comments:	
		MB wheat: 31 MB pot: 9	DR Grade: 2	Main limitation. Wetness and droughtiness		ALC grade 2

### AUGER BORING DESCRIPTIONS

No / land use/ gradient	Bottom Depth of horizon	Texture	Colour	Gleyed / spl	% Stone >2cm /total	Wetness Class	Main Limitation	Grade
1	270	MSL	Rd/br	-	<2			
Fal	780	LMS	Rd/br	-	<2			
	1100	MS	Yl/rd	-	<2	1	Dr	2
2	310	SCL	Dk Rd/br	-	<2			
Fal	980	SCL	Rd/br	Och few + grey ped faces + mn cons	<2			
	1100	C	Rd/br		<2	2	We	2
3	270	HCL	Br	Och few	<2			
Fal	480	C	Br	Och many + mn cons	<2			
	630	C	Br	Och com	2/4			
	820	SCL	Gr	-	<2			
	1100	C	Br	Och abundant	<2	4	We	3b
4	200	HCL	Dk br	-	<2			
Fal	360	C	Rd/br	Och few grey ped faces + mn cons	<2			
	630	SC	Rd/br	Och many grey ped faces + mn cons	<2			
	770	C	Gr	Och many + mn cons	<2			
	110	C	Br	Och abundant + mn cons	<2	4	We	3b
5	330	HCL/C	Br	Och few + mn cons	<2			
Fal	1000	C	Br	Och com + grey ped faces + mn cons	<2	4	We	3b
6	390	HCL	Dk br	-	<2			
	1100	C	Br	Och c + grey ped faces + mn cons	<2	4	We	3b
7	350	SCL	Dk br	-	3			
Fal	640	SCL	Dk br	Och com +mn cons	3			
	830	SCL/C	Rd	Mn cons	<2			
	1050	C	Dk rd/br	Mn cons	<2	2	We / Dr	2
8	250	SCL	Dk br	-	3			
	420	MCL	Br	Mn cons	3			
	510	SCL	Rd/br	-	<2			
	970	C	Rd/br	Grey ped faces	3	2	We / Dr	2

9	230	SCL/SL	Br	Mn cons	3			
	370	SCL	Dk br	Och com +mn cons	<2			
	830	HCL	Br	Och many +mn cons	<2			
	1200	SCL	Yl/rd	Och com +mn cons	3	3	We	2/3a
10	310	MCL	Br	-	<2			
	1100	C	Rd/br	Grey ped faces	<2	4	We	3b
11	340	MSL	Dk br	-	<2			
	680	MSL	Br	Och few + mn cons	<2			
	1100	SCL	Br	Och many	3	1		1
12	250	SCL/SL	Br	-	<2			
	490	MSL	Rd/br	Och few + mn cons	<2			
	650	SCL	St br	Grey ped faces + mn cons	<2			
	900+	C	Rd/br	Och few	<2	2	We	2



## Appendix 3

### Laboratory Analysis

(See following page)



**ANALYTICAL REPORT**

<b>Report Number</b>	<b>94468-18</b>	<b>K957</b>	<b>CARLA RICHMOND</b>	<b>Client 06-03-2018</b>
<b>Date Received</b>	<b>09-MAR-2018</b>		<b>RSK ADAS LTD</b>	
<b>Date Reported</b>	<b>16-MAR-2018</b>		<b>DRAYTON</b>	
<b>Project</b>	<b>SYSTON ALC</b>		<b>ALCESTER ROAD</b>	
<b>Reference</b>	<b>06 03 2018</b>		<b>STRATFORD UPON AVON</b>	
<b>Order Number</b>			<b>CV37 9RQ</b>	

Laboratory Reference		SOIL377014	SOIL377015							
Sample Reference		PIT 2	PIT 9							
Determinand	Unit	SOIL	SOIL							
Sand 2.00-0.063mm	% w/w	59	59							
Silt 0.063-0.002mm	% w/w	22	23							
Clay <0.002mm	% w/w	19	18							
Textural Class **		SCL	SCL/SL							

**Notes**

Analysis Notes      The sample submitted was of adequate size to complete all analysis requested.  
 The results as reported relate only to the item(s) submitted for testing.  
 The results are presented on a dry matter basis unless otherwise stipulated.

Document Control      **This test report shall not be reproduced, except in full, without the written approval of the laboratory.**

Reported by      ***Katie Dunn***  
 Natural Resource Management, a trading division of Cawood Scientific Ltd.  
 Coopers Bridge, Braziers Lane, Bracknell, Berkshire, RG42 6NS  
 Tel: 01344 886338  
 Fax: 01344 890972  
 email: enquiries@nrm.uk.com

\*\* Please see the attached document for the definition of textural classes.

## ADAS (UK) Textural Class Abbreviations

The texture classes are denoted by the following abbreviations:

<b>Class</b>	<b>Code</b>
Sand	S
Loamy sand	LS
Sandy loam	SL
Sandy Silt loam	SZL
Silt loam	ZL
Sandy clay loam	SCL
Clay loam	CL
Silt clay loam	ZCL
Clay	C
Silty clay	ZC
Sandy clay	SC

For the *sand*, *loamy sand*, *sandy loam* and *sandy silt loam* classes the predominant size of sand fraction may be indicated by the use of prefixes, thus:

vf	Very Fine (more than 2/3's of sand less than 0.106 mm)
f	Fine (more than 2/3's of sand less than 0.212 mm)
c	Coarse (more than 1/3 of sand greater than 0.6 mm)
m	Medium (less than 2/3's fine sand and less than 1/3 coarse sand).

The subdivisions of *clay loam* and *silty clay loam* classes according to clay content are indicated as follows:

M	medium (less than 27% clay)
H	heavy (27-35% clay)

Organic soils i.e. those with an organic matter greater than 10% will be preceded with a letter O.

Peaty soils i.e. those with an organic matter greater than 20% will be preceded with a letter P.

## Appendix 4: Description of the Grades and Subgrades

The ALC Grades and Subgrades are described below in terms of the types of limitation which can occur, typical cropping range and the expected level and consistency of yield. In practice, the grades are defined by reference to the land's physical characteristics, for which the cut-offs are described in Section 3 of the 1988 MAFF (now Defra) ALC guidelines. The most productive and flexible land falls into Grades 1, 2 and Subgrade 3a and collectively comprises about one-third of the agricultural land in England and Wales. About half the land is either of moderate quality (Subgrade 3b) or poor quality (Grade 4). Although less significant on a national scale, such land can be locally valuable to agriculture and the rural economy where poorer farmland predominates. The remainder is very poor quality land in Grade 5, which mostly occurs in the uplands.

Descriptions are also given of other land categories which may be used on ALC maps.

### ***Grade 1 - excellent quality agricultural land***

Land with no or very minor limitations to agricultural use. A very wide range of agricultural and horticultural crops can be grown and commonly includes top fruit, soft fruit, salad crops and winter harvested vegetables. Yields are high and less variable than on land of lower quality.

### ***Grade 2 - very good quality agricultural land***

Land with minor limitations which affect crop yield, cultivations or harvesting. A wide range of agricultural and horticultural crops can usually be grown but on some land in the grade there may be reduced flexibility due to difficulties with the production of the more demanding crops such as winter harvested vegetables and arable root crops. The level of yield is generally high but may be lower or more variable than on Grade 1 land.

### ***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 (e.g. cereals and forage crops) the yields of which are variable. In moist climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land.

***Grade 5 - very poor quality agriculture land***

Land with very severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.