

# SIMPLY SUSTAINABLE SOILS

## Case Study: Elveden Farm



<b>Farmed by:</b>	Andrew Francis
<b>Location:</b>	Norfolk
<b>Farm size:</b>	4047 ha
<b>Farm type:</b>	Arable and vegetable
<b>Soil type:</b>	Sandy loam
<b>Annual rainfall:</b>	660 mm
<b>Topography:</b>	Flat

Elveden Farms is a LEAF Demonstration Farm in Norfolk. The Elveden Estate, owned by the Guinness Family since 1984, is one of the largest single farm units in lowland Britain and is renowned for growing cereals and root vegetables. This case study will cover the story of the soil management on the farm and covers key soil data from two fields, 'Eriswell Gap' and 'Husk East'. Soil scores have been calculated for each field, for a number of years between 2005 and 2011, using the Simply Sustainable Soils booklet available online free of charge via [www.leafuk.org/leaf/farmers/simplysustainablesoils.eb](http://www.leafuk.org/leaf/farmers/simplysustainablesoils.eb) - download the booklet, assess your fields and see how your fields compare.

### Soil Management at Elveden Farms

#### Traffic

- High horsepower machinery is on tracks to minimise compaction.
- Tramlines are used to minimise the area of compaction.
- Control traffic farming is not used as it is not applicable to vegetables and Andrew is concerned that it makes no allowance for topography.

#### Tillage

- In 2010, Andrew changed cultivation to use a single pass cultivator as it saves time and money.
- Prior to that, the routine had been to plough and press prior to cultivation.
- This is no longer necessary and the new practice aids the soil structure as only a single pass from machinery is needed.

#### Cover Crops

- Stubble is left on the field over winter where possible.
- When the rotation is moving from early lifting potatoes to onions this is not possible and instead a fast growing rye grass cover crop is used.
- This provides silage for sheep, acts as a weed suppressant and adds some organic matter into the soil.

## Specificity

- Andrew is looking to do more research on field specific management.
- Two years ago, he started taking detailed analysis of inputs and outputs of each field to produce a net value for each field.
- This information will then be analysed and used to optimize and target fertiliser additions and other inputs.

## Field Profile: Eriswell Gap

**Size:** 20.5 ha

**Soil type:** Chalky sand

**Topography:** Flat

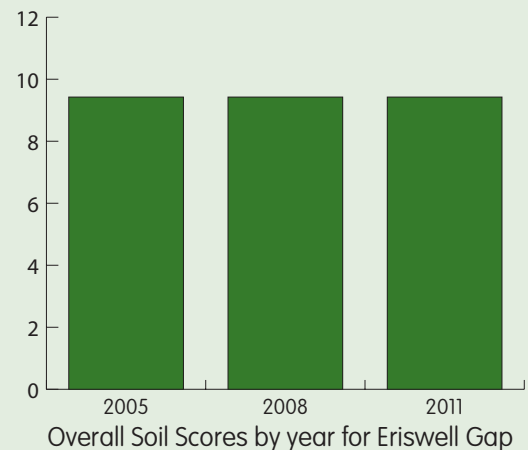
**Cropping:** Potatoes, onions, cereals, carrots, parsnips

**Conservation measures:** Grass belts, shelter beds, 2m margins



## Soil Score

	2005	2008	2011
Step 1 Soil Structure	2	2	2
Step 2 Drainage	2	2	2
Step 3 Compaction	2	2	2
Step 4 Soil Organic Matter Status	1	1	1
Step 5 Soil pH and Nutrients	2	2	2
Step 6 Biological Soil Data	0.5	0.5	0.5
<b>Overall Soil Score</b>	<b>9.5</b>	<b>9.5</b>	<b>9.5</b>



## Soil measurements

The Soil Score is calculated using the [Simply Sustainable Soils](http://www.leafuk.org/leaf/farmers/simplysustainablesoils.eb) booklet, available to download here [www.leafuk.org/leaf/farmers/simplysustainablesoils.eb](http://www.leafuk.org/leaf/farmers/simplysustainablesoils.eb). Why not calculate your score and see how you compare - perhaps you can try some of the changes Andrew has made to improve your score!

	2005	2008	2011
<b>pH</b>	6.8	6.8	6.8
<b>P index</b>	3+	3	3
<b>K index</b>	1-	1+	2-
<b>Mg index</b>	1	1+	1
<b>Crop</b>	Parsnips	Wheat	Wheat
<b>Yield</b>	58 t/ha	11 t/ha	9 t/ha
<b>Organic Matter Input</b>	0	0	0
<b>N input</b>	120 kg/ha	232 kg/ha	222 kg/ha
<b>P input</b>	0	0	0
<b>K input</b>	150 kg/ha	0	0
<b>Mg input</b>	100 kg/ha	0	0
<b>Lime Input</b>	0	0	0

## Importance of soil type

- The soil type at Elveden varies throughout the farm.
- Andrew is aware of the influence of this variation in particular in relation to water holding capacity and compaction.
- Eriswell Gap's chalky soil has a higher water holding capacity than Husk East's sandier soil. As a result, Andrew often sees higher yields in Eriswell Gap.
- However Husk East rarely, if ever, has any compaction issues due to the sandy soil. In contrast it took two cultivations to sort out compaction problems in Eriswell Gap after the wet 2012 harvest.

## Cation Exchange Capacity (CEC)

- Andrew used to measure CEC but stopped as it was very expensive and there was no correlation to fertility.

## Field Profile: Husk East

**Size:** 13.4 ha

**Soil type:** Sand - sandy loam

**Topography:** Flat

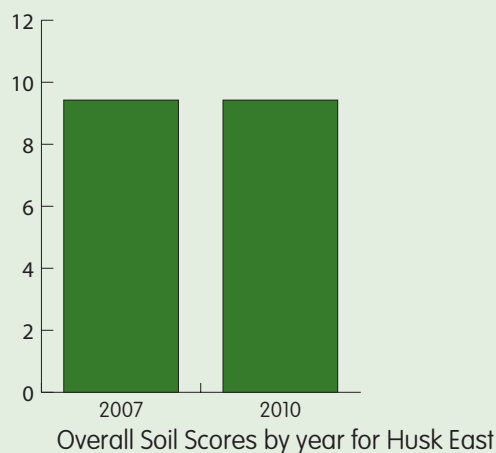
**Cropping:** Potatoes, onions, cereals, carrots, parsnips

**Conservation Measures:** Grass belts, shelter beds, 2m margins



## Soil Score

	2007	2010
Step 1 Soil Structure	2	2
Step 2 Drainage	2	2
Step 3 Compaction	2	2
Step 4 Soil Organic Matter Status	1	1
Step 5 Soil pH and Nutrients	2	2
Step 6 Biological Soil Data	0.5	0.5
<b>Overall Soil Score</b>	<b>9.5</b>	<b>9.5</b>



The Soil Score is calculated using the [Simply Sustainable Soils](http://www.leafuk.org/leaf/farmers/simplysustainablesoils.eb) booklet, available to download here [www.leafuk.org/leaf/farmers/simplysustainablesoils.eb](http://www.leafuk.org/leaf/farmers/simplysustainablesoils.eb). Why not calculate your score and see how you compare - perhaps you can try some of the changes Andrew has made to improve your score!

## Soil measurements

	2007	2010
<b>pH</b>	-	6.5
<b>P index</b>	3	3
<b>K index</b>	2+	1
<b>Mg index</b>	2-	-1
<b>OM %</b>	1.64	2.03
<b>Crop</b>	Potatoes	Carrots
<b>Yield</b>	28 t/ha	65 t/ha
<b>Organic Matter Input</b>	31 t/ha bullock manure	-
<b>N Input</b>	0	78 kg/ha
<b>P Input</b>	0	0
<b>K Input</b>	315 kg/ha	150 kg/ha
<b>Mg Input</b>	160 kg/ha (MgO)	75 kg/ha (MgO)
<b>Lime Input</b>	0	0

## About LEAF

LEAF (Linking Environment And Farming) is a leading organisation delivering more sustainable food and farming. LEAF works with farmers, the food industry, scientists and consumers to inspire and enable sustainable farming that is prosperous, enriches the environment and engages local communities. LEAF promotes Integrated Farm Management (IFM), a whole farm business approach that delivers sustainable farming. This is one of 23 case studies demonstrating some soil tips from a range of farm, soil and enterprise types, available to LEAF members through myLEAF online.

Join LEAF online at [www.leafuk.org](http://www.leafuk.org)

The production of these case studies has been kindly supported by ASDA

**ASDA**

