



Assured Agronomy

Agricultural Land Impact Assessment
of Land to the west of Kelham,
Nottinghamshire
January 2024

Agricultural Impact Report

Issued by Assured Agronomy Ltd, an independent agronomy company covering Lincolnshire, Nottinghamshire and Yorkshire, consisting of 7 graduate farm advisors. Cumulative experience of over 100 years, advice is provided independent of sales to assist farms to farm profitably and sustainably.

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Summary

Assured Agronomy Ltd was commissioned by Sirius Planning to conduct an Agricultural Impact Assessment on the proposed solar development at Land to the west of Kelham, Nottinghamshire.

This assessment analysed the overall contribution to agricultural production in the region and across the country, which contributed minimally over the 5 previous years for all crops. Discussion of the current cereal, sugar beet and potato markets and production show instability. Extreme weather conditions over the past few years has made the production of root crops challenging with harvest difficult in wet Autumn and winter months and irrigation required in the summer months. This has resulted in crops grown for energy becoming the main stay of the rotation.

Following the potential construction of the site it could return to partial agricultural use with the option of sowing wildflowers to increase biodiversity and/or grazing livestock such as sheep or poultry.

1.0 Introduction

- 1.1 In November 2023 Sirus Planning commissioned Assured Agronomy Ltd to carry out an Agricultural Impact Assessment on the site Land to the west of Kelham, in the East Midlands.
- 1.2 The site currently comprises of 71ha of agricultural land used for cropping winter wheat, barley, potatoes, sugar beet, parsnips and forage rye and maize, with 5-15% left uncropped. The aim of this report is to assess the impact of this proposed development on agricultural production in the region, current markets and the agricultural opportunities going forward.

2.0 Previous Yields

- 2.1 The Department for Food and Rural Affairs (Defra) provides regional production figures for cereals and oilseeds; relevant sections can be found in appendix 1. Amalgamating the farms yield records with the regional production totals provided by Defra allows an accurate assessment of the contribution of this site to the regions agricultural production. The farm lies within the region of the East Midlands.

Table 1: Yields and proportion of the regional tonnage and area of Winter Wheat produced at the site over the past 5 years.

Wheat		Tonnage				
Field	Area	2023	2022	2021	2020	2019
Land off broadgate rd	48.71		7.63			
Total Tonnage	48.71	0	371.6573	0	0	0
Total Area			48.71			
UK Area			1809000			
% of Area			0.003%			
Regional Tonnage			2922500			
% of Regional Tonnage			0.013%			

Source: (Defra, 2022)

Table 2: Yields and proportion of the regional tonnage and area of Barley produced at the site over the past 5 years.

Barley		Tonnage				
Field	Area	2023	2022	2021	2020	2019
Land off broadgate rd 2020	42.9				4.11	
Land off broadgate rd 2023	48.71	6.8				
Total Tonnage	91.61	331.228	0	0	176.319	0
Total Area		48.71			42.9	
Regional Area					163,009	
% of Regional Area					0.026%	
Regional Tonnage					887,688	
% of Regional Tonnage					0.020%	

Source: (Defra, 2022)

Table 3: Yields and proportion of the regional tonnage and area of Potato produced at the site over the past 5 years.

Potatoes		Tonnage				
Field	Area	2023	2022	2021	2020	2019
Red House	5.19					42
18 ac	7.39					42
Land off broadgate rd	16.2			49.9		
Total Tonnage	28.78			808.38	0	528.36
Total Area				16.2		12.58
UK Area						127000
% of Area						0.01%
UK Tonnage						4797000
% of UK Tonnage						0.011%

Source: (AHDB, 2021)

Table 4: Yields and proportion of the tonnage and area of Sugar Beet produced at the site over the past 5 years.

Sugar Beet		Tonnage				
Field	Area	2023	2022	2021	2020	2019
Land off broadgate rd	46.16			86.39		
Total Tonnage				3987.762		0
Total Area				46.16		
UK Area				91000		
% of Area				0.051%		
UK Tonnage				6015000		
% of UK tonnage				0.066%		

Tables 1,2,3 and 4 show the very limited impact of removing this land from food production in the region of East Midlands and across the UK.

Table 5: Yields and proportion of the area of Maize produced at the site over the past 5 years.

Maize		Tonnage				
Field	Area	2023	2022	2021	2020	2019
Red House	5.19	36	26	-	26.9	
Paddy	3.6	36	26	31	26.9	
18 ac	7.39	36	-	31	26.9	
Land off broadgate rd	29.96	-	-	36		
Total Tonnage		582.48	228.54	1422.25	435.242	0
Total Area		16.18	8.79	40.95	16.18	
UK Area		240486	221604	227046	228213	228252
% of UK Area		0.007%	0.004%	0.018%	0.007%	0.000%

Table 5 shows how the area used for growing maize is below 0.02% of the total area. Additionally this maize is grown for an energy source rather than food production, 3.6ha in 2019 was also used to grow forage rye, however going forward the farms chose maize as the preferred forage.

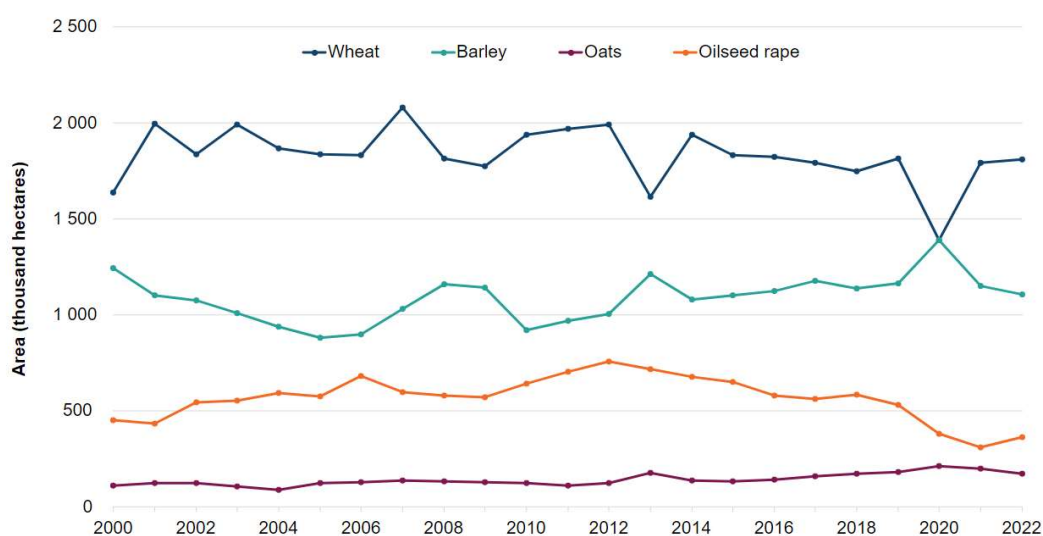
Yields are unavailable for the land rented out for parsnips the parsnip area on the site peaked in 7.39ha, Defra stats show there are 2500-2900ha of parsnips grown within the UK each year, making the area equate to less than 0.3%. Additionally due to the spaced out rotation of parsnips this would not occur every year and weather conditions on the poor soil type has made the production of root crops difficult.

3.0 Market

3.1 Cereals

Winter wheat and spring barley are both grown on the site with an end market of feed, milling or malting. Prices hit record highs in May 2022 due to worries of food scarcity worldwide as a result of the war in Ukraine and extreme weather events. The markets have since been on a steady decline. Area of production in the UK varies between cereal crops but overall cereal production remains quite constant, this can be seen in figure 1. Fluctuation year on year is often because of weather conditions.

Figure 1: Cereal and Oilseed Areas UK

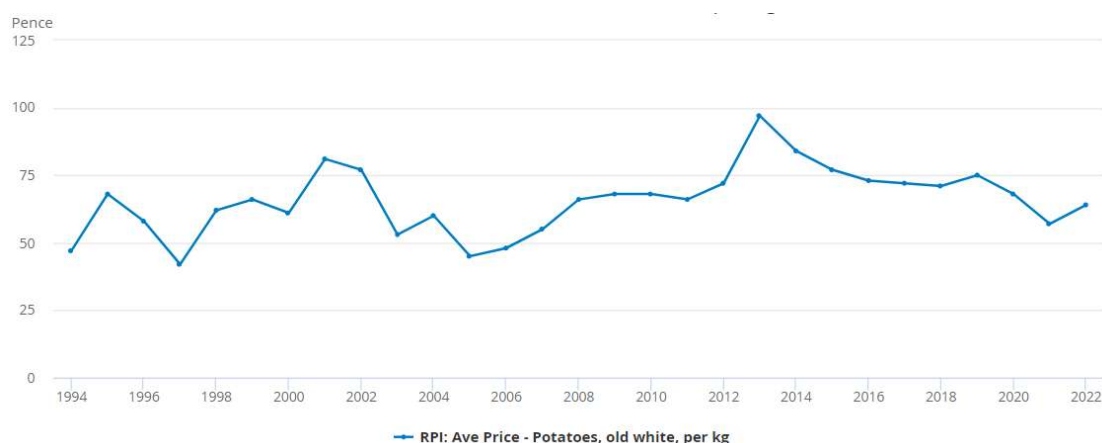


Source: (AHDBa, 2022)

3.3 Potatoes

Potato production is a high-cost industry, with energy, land rent and fertiliser prices soaring, farm business consultants Andersons' have estimated an increase in costs by 15-20% compared to 2021. Prices collected by the office of national statistics in Figure 3 show the average price of potatoes since 1994. The land in question is at risk of waterlogging which makes growing root crop difficult, especially in recent years with the severe weather conditions. In particular lifting of potatoes in October 2019 had to be delayed until January 2020 due to such conditions. This delay not only impacts yield but quality too with yield dropping from a budgeted 56T/ha to 42T/ha and quality dropping to second grade.

Figure 3: Average Price of White Potatoes



Source: (Office of National Statistics, 2023)

3.4 Sugar Beet

The white sugar market has soared and in turn the sugar beet market is strong after British Sugar increased prices to 40/T. However as the sugar market in the UK is dominated by British sugar growers are therefore dependant on prices offered by British sugar. 2022 saw a reduction of 18% in sugar beet production as a result of a decrease in planted area by 3.8% (87,000ha) and hot dry conditions impacting yield later on in the season followed by frost damage in the winter, resulting in an increased risk to growers.

4.0 External influences on the market

The agricultural industry has always fluctuated and is governed by global supply, weather, and politics across the world. These factors play a huge role in the availability and market price of produce. Input costs and the produce markets have been very volatile over the past few years reaching record numbers.

The war in Ukraine had an immediate impact on UK agriculture. Ukraine and Russia on average accounted for 18% of global cereal production (Food and Agriculture Organisation of the United Nations, 2022). The markets in May 2022 rose as a response to the risk of the remaining harvested crop being unable to leave the country due to blockades and damaged transport routes, this can be seen in figure 4. The rapid increase in grain price was met by the soaring price of energy, fuel and fertilisers. With the cost-of-living rising labour costs have also risen, contributing to the ever-increasing input costs. These high input costs required combined with uncertain market prices makes the agricultural industry unpredictable. Impacts of the soaring prices have already affected produce down the food supply chain with egg and fresh food shortages.

Farms in the UK are also due to lose the EU's Common Agricultural Policy (CAP) payments following Brexit, at times these subsidies have been responsible for up to three quarters of Total Income from Farming (TIFF) in the UK. Payments are being phased out and replaced with the UKs environmental schemes, as it stands however

these will not come close to replacing current CAP payments. Farmers in turn are being encouraged to diversify and find other income streams to compensate for the loss in subsidies.

Figure 4: London wheat prices 2021-2023



Source: (AHDB, 2023)

5.0 Impact on current farming business

The site in question covers 71ha of Agricultural land, of which, an area ranging from 7.56-11.7ha has been left uncropped over the past 5 years due to poor soil fertility or conditions which have made the area unworkable.

These soils are prone to the effects of a high water table, which makes Autumn and winter operations impossible, especially during wet seasons like they are experiencing this season. As the cropping year progresses into spring/summer the water table drops which means irrigation is required to get an economically viable yield especially for potatoes and sugar beet. The irrigation lagoon is used at the Land off Broadgate road has a 45,000 cubic metre irrigation licence.

Soils of England and Wales map supports these soil types describing them as the following; Arrow (543), Glaciofluvial drift, deep permeable coarse loamy soils affected by groundwater can grow cereals, some field vegetable and potatoes. Fladbury 2 (813c), river alluvium, stoneless clayey soils affected by groundwater, sandy subsoil can grow cereals where flood risk is low, mainly permanent pasture for stock rearing.

The proposed solar farm plan would also provide a stable income for the farms, diversifying from the unpredictable agricultural market, whilst contributing to the regions' green energy supply.

6.0 Future options

If the proposed development was constructed there would be areas of land under and surrounding the panels which could still be utilised to improve biodiversity and contribute to agricultural production.

6.1 Increase biodiversity

Grass and flower mixes can be sown to provide food sources and habitats for a range of wildlife and in turn increasing biodiversity and populations. Beehives can also be introduced on the site where there will be a food source and habitat which will not be affected by agricultural practises.

6.2 Agricultural enhancement

The addition of livestock, such as sheep or poultry is also possible to contribute to the regions agricultural impact. Between 4-8 sheep/ha could graze the proposed fenced site (BRE, 2014), which is just over half the number on a hectare of conventional grazing (NSA, 2022). The shade provided would also be beneficial to the livestock, which is recognised by the RSPCA Freedom Foods certification scheme, this would allow a possible stocking density of 2000 birds/ha. Livestock would also manage the grass and mitigate the need for mechanical or chemical maintenance.

To maximise the benefits of biodiversity and grazing, livestock can be removed in either spring or summer to allow either early or late flowering plants to flourish.

Consideration of future agricultural plans should be considered during the potential construction. Procedures to avoid compaction and damage to land drains should be considered to ensure the land is left in good conditions to carry out possible grazing and sowing of flower and grass mixes.

7.0 Conclusion

The results of the Agricultural Impact assessment conducted by Assured Agronomy Ltd on the proposed site conclude that there are no significant impacts on the regions Agricultural production. The agricultural production of the site contributed minimally to food production in the region and across the country. Additionally in recent years most of the land has been used to produce energy crops for Anaerobic Digestors, due to its unsuitability to grow crops for food.

Current markets show a requirement of a stable income for the farm to ensure the sustainability of the farm enterprise going forward with volatile input and output costs, and the loss of CAP payments.

Additionally, there is the potential for agricultural use of the land following the proposed development. Options include enhancing the areas biodiversity and grazing livestock, contributing to the regions' food production.

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Appendix

Appendix 1: Defra Production data for cereals and Oilseed

Defra Production data for Spring Barley

Areas	2017	2018	2019	2020	2021
United Kingdom	753,894	751,467	709,513	1,075,945	744,853
England	481,587	471,081	443,933	791,710	470,929
North East	13,776	12,476	11,057	26,567	16,653
North West and Merseyside	26,442	24,614	23,328	33,850	22,296
Yorkshire & The Humber	56,872	56,351	52,569	113,871	67,191
East Midlands	73,702	78,130	73,118	163,009	87,062
West Midlands	32,461	28,402	25,489	59,791	31,898
Eastern	103,612	104,617	98,201	160,815	103,693
South East and London	78,621	77,934	77,617	112,365	67,243
South West	96,102	88,556	82,553	121,442	74,893
Yields	2017	2018	2019	2020	2021
United Kingdom	5.6	5.2	6.3	5.8	5.7
England	5.5	5.0	6.4	5.4	5.6
North East	5.5	5.0	6.7	5.7	6.0
North West and Merseyside	3.3	3.7	5.1	4.3	4.9
Yorkshire & The Humber	6.0	5.3	6.5	5.6	5.7
East Midlands	5.9	4.9	6.6	5.4	5.6
West Midlands	4.6	4.3	5.8	5.0	5.1
Eastern	5.9	5.1	6.7	5.5	5.8
South East and London	5.8	5.2	6.6	5.5	5.7
South West	5.3	5.2	6.0	5.5	5.4
Production	2017	2018	2019	2020	2021
United Kingdom	4,220,456	3,887,367	4,497,646	6,200,990	4,219,588
England	2,655,028	2,353,436	2,823,532	4,296,063	2,628,671
North East	75,324	62,893	74,095	152,760	99,635
North West and Merseyside	86,948	90,950	118,813	145,272	109,921
Yorkshire & The Humber	339,254	297,235	341,462	636,345	383,231
East Midlands	432,110	379,776	485,755	887,688	490,450
West Midlands	148,048	122,201	147,368	296,783	161,529
Eastern	614,670	538,262	653,459	881,894	596,729
South East and London	453,175	404,330	511,318	623,003	386,213
South West	505,497	457,789	491,261	672,318	400,962

Defra Production data for Wheat

Areas	2017	2018	2019	2020	2021
United Kingdom	1,791,830	1,747,673	1,815,769	1,387,165	1,790,395
England	1,652,143	1,618,871	1,676,833	1,265,111	1,654,867
North East	67,969	68,275	71,598	52,996	67,599
North West and Merseyside	36,954	35,953	34,588	23,338	31,606
Yorkshire & The Humber	233,389	230,073	237,006	172,548	228,281
East Midlands	324,631	313,227	325,792	227,327	318,243
West Midlands	160,424	159,720	165,914	112,694	156,130
Eastern	456,774	446,258	464,129	384,842	478,240
South East and London	213,822	209,182	215,506	170,768	218,761
South West	158,180	156,181	162,299	120,599	156,007
Yields	2017	2018	2019	2020	2021
United Kingdom	8.3	7.8	8.9	7.0	7.8
England	8.3	7.8	9.0	6.9	7.8
North East	8.2	7.9	9.0	7.2	8.1
North West and Merseyside	5.8	4.9	6.6	5.2	6.7
Yorkshire & The Humber	8.6	7.9	9.0	6.7	8.2
East Midlands	8.4	8.0	9.0	6.0	8.1
West Midlands	7.9	7.1	8.7	5.9	7.5
Eastern	8.6	8.1	9.2	7.4	7.7
South East and London	8.4	8.1	9.3	7.4	7.4
South West	7.9	7.7	8.3	7.3	7.6
Production	2017	2018	2019	2020	2021
United Kingdom	14,836,963	13,554,843	16,224,511	9,657,885	13,987,677
England	13,722,124	12,673,896	15,036,897	8,672,425	12,863,299
North East	560,298	536,005	641,916	380,778	549,064
North West and Merseyside	213,525	177,814	229,236	120,263	211,101
Yorkshire & The Humber	2,015,671	1,807,958	2,142,154	1,151,009	1,873,698
East Midlands	2,717,440	2,518,508	2,945,102	1,366,742	2,569,607
West Midlands	1,259,593	1,137,406	1,448,803	665,385	1,163,652
Eastern	3,905,794	3,601,118	4,266,691	2,832,786	3,695,942
South East and London	1,804,177	1,686,124	2,013,964	1,269,906	1,608,455
South West	1,245,626	1,208,964	1,349,031	885,557	1,191,780

