

# **YARA ALS N-Sensor – “An unbelievably better harvest”**

## **A J Stephenson and Son, Withernsea - A first year with the N-Sensor.**

Chris Mason – Precision Decisions Ltd. 15-11-16

The Stephenson family farm about 1400ha of quite variable arable land at Withernsea, East Yorkshire just inland from the Yorkshire Coast.

They are new ALS N-Sensor users this season having decided to take one on lease as a first move into variable rate farming. Installed in January of 2016 and used on both a spreader and Chafer sprayer, early applications being by the spreader and last application by the sprayer.

Having dealt with the Stephensons throughout this first year from initial meeting, through the N-Sensor workshops in the early New Year and continuing, as part of our follow up service I got back in touch with them after harvest to find out how they had got along with this new piece of variable rate Nitrogen technology.

Virtually the first thing said to me in a phone call by Keith Stephenson (Senior) was a comment from their combine driver David Stephenson “An unbelievably better harvest” followed by, from Keith himself, “We are entirely happy with the performance of the sensor during this first season”

After these comments I thought it would be worthwhile going to meet with the Stephensons and gather more information. I met with Keith Stephenson (Junior) spreader driver, and David Stephenson the combine and sprayer operator.



The Stephensons with the YARA N-Sensor mounted on their Chafer sprayer and Chris Mason from Precision Decisions Ltd.

In their office at Northfield Farm, David and Keith took me through their experience with the N-Sensor through this first season and then went on to show me in more detail how well it had performed through Biomass and N-Application maps as recorded by the sensor.

Whether on OSR or cereals they felt that the N-Sensor had performed as promised. Within a short time, particularly by second application, they had passed through, "the sceptical stage" as Keith said, and could see from the maps, particularly the Biomass maps that the crops were being evened up across the fields. They used the N-Sensor in Absolute mode on OSR and both Target and N-Application mode on cereals depending on circumstances in the field.

Having attended the N-Sensor workshop at Lincoln Showground in January of 2016 they found the learning and familiarisation process when first using the sensor a little daunting. A couple of early technical issues were dealt with by Precision Decisions Ltd in a timely and professional manner. Once up and running they settled into the mind-set of letting the N-Sensor "do its thing" even though at times this may have seemed a little counter intuitive based on past flat rate experience.

By the second application of Nitrogen the difference on the maps, Biomass and N-Application was quite evident. The first variable rate application had removed a huge amount of growth variation, and evened up the crop across different soil types within the same field. On the first application the sensor was up and down on its rates as the field was driven, but on the second application there was much less rate variation and a more consistent rate.

As the growing season progressed, not one of the best due to low levels of sunlight throughout May and June, both Keith and David could see just how even their crops were looking, this visual impression was confirmed by Biomass maps recorded by the N-Sensor.

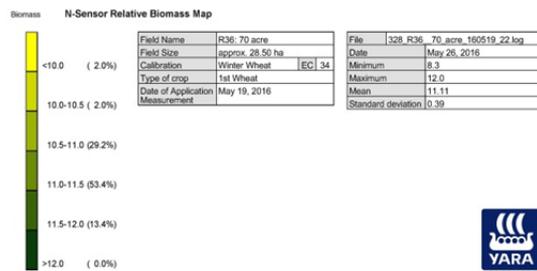
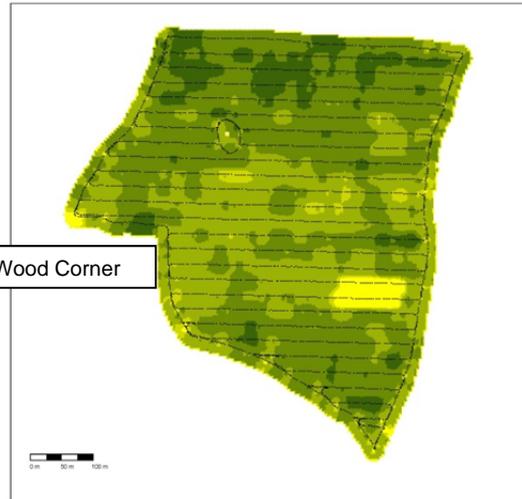
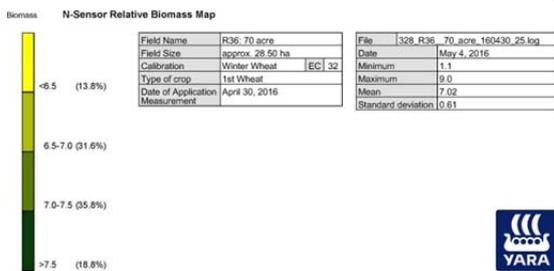
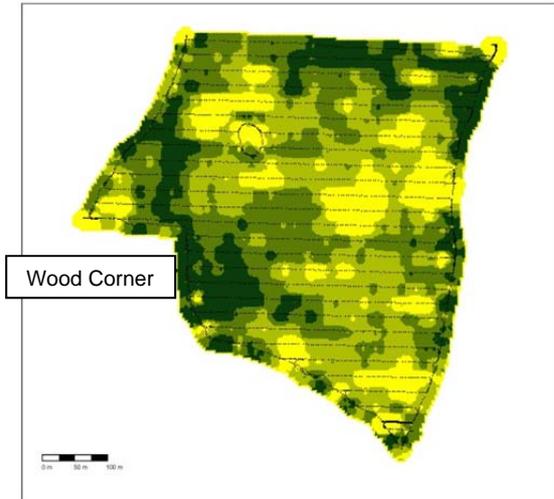
Harvest time proved what they thought to be the case. Overall the harvest was by far the smoothest they had ever experienced. David (combine driver) was particularly impressed by the way that the combine drove. The much more consistent crops reduced RPM variations and header height movements markedly. Overall even-ness of the crops made the whole "harvest unbelievably better" from previous years. One field R36 has a particular area at 'Wood Corner' that when flat rate N applied, even with manual variation in previous years, has always suffered lodging. Since 2004, when David started driving the combine for Stephenson's this part of field R36 has always suffered from lodging. This year there was no lodging here or anywhere else on the farm.

Overall, taking a poor growing season into account the Stephenson's feel that the N-Sensor has contributed to at least 0.5 tonnes/ha additional yield on both OSR and cereals.

David went on to say that the N-Sensor "has definitely paid for itself during this first year of operation in increased yields and a much easier harvest", he went on to say "it's not necessarily about saving costs or reducing inputs, it's about maximising the effective use of Nitrogen by putting it where it's needed"

Another benefit they noticed was, "A much reduced need for growth regulators on specific areas"

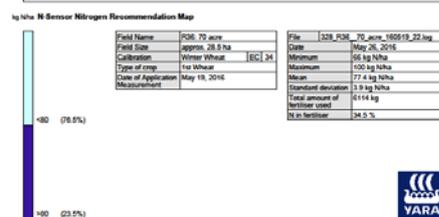
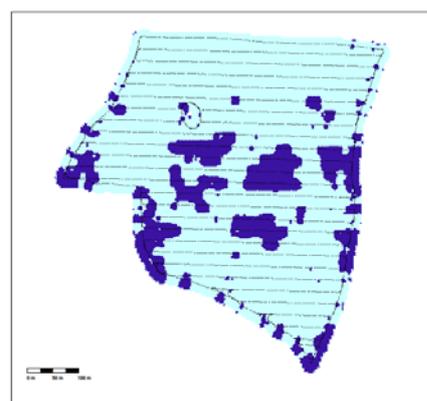
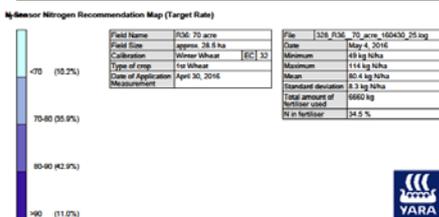
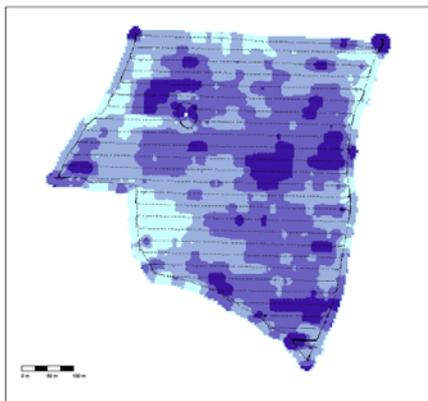
Looking at a couple of fields in detail shows what an improvement the N-Sensor has made in increasing yields, ironing out variation, reducing lodging and improving the combining process.



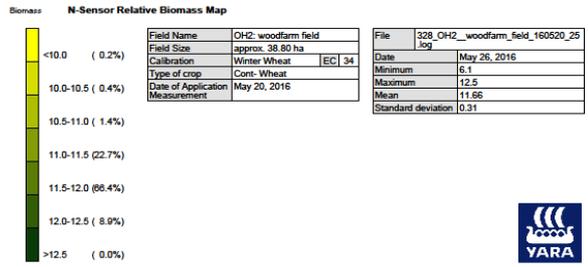
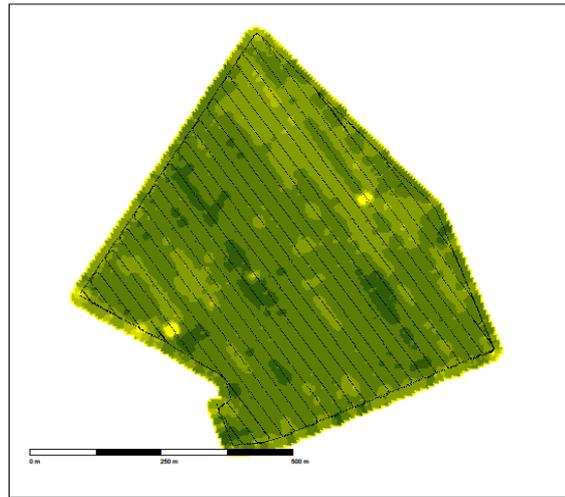
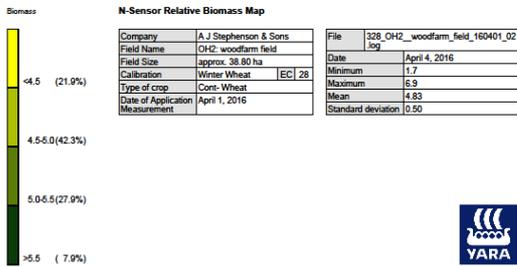
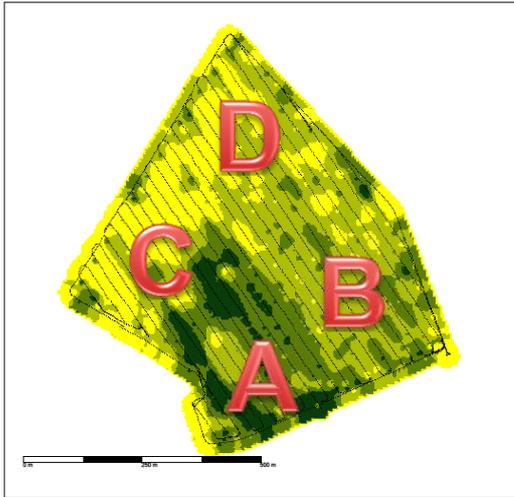
Field R36 – Wood Corner. Biomass Map 1, WW 30-04-16

Biomass Map 2, WW 19-05-16

Note the dark green area Relative Biomass >7.5 at April 30 2016 just to the east of Wood Corner. This is the area (approx 2ha) mentioned above that has lodged every year since 2004 until this year. Note standard deviation figure in Map 1 is 0.61, reduced to 0.39 in Map 2 dated May 4 2016.



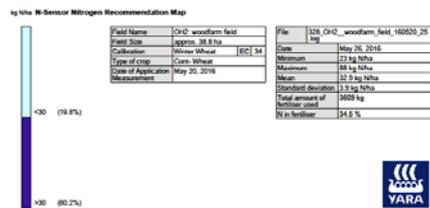
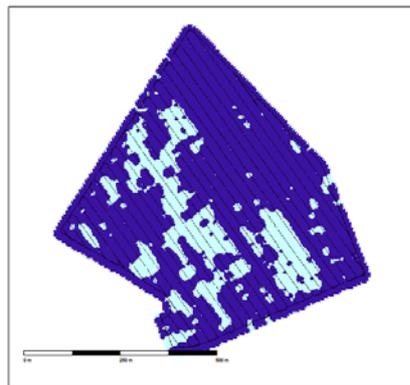
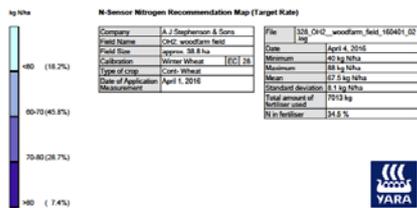
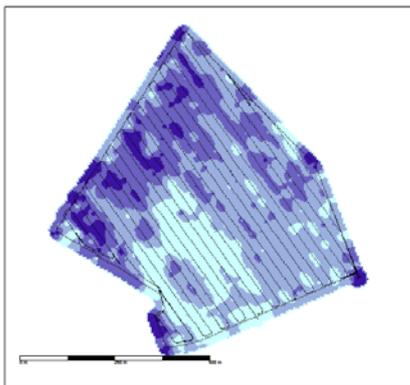
Corresponding N-Application Maps for Field R36 showing how the first application markedly reduced the variation in N-Applied at the last application. Standard deviation lowered from 8.3kg N/ha to 3.9kg N/ha.



Field OH2 'Battenberg' Biomass Map 1 WW, 01-04-16

Biomass Map 2, WW 20-05-16

Known by the Stephenson as 'Battenberg' field, OH2 has always yielded variably in four discrete areas when at flat rate. After variable rate N applied this season the field became far more homogenous with standard deviation of biomass figure reducing from 0.50 to 0.31.



Corresponding N-Application Maps for Field OH2 showing how the first application markedly reduced the variation in N-Applied at the last application. Standard deviation lowered from 8.1kg N/Ha to 3.9kg N/ha.

**TOTAL AREA OF Oil Seed Rape 2015-16 - 300Ha.**

Date	Field	Total (Lt or K)	Area (Ha)	Av Rate	Target	Liquid		AN
						Kg N	Kg S	Kg N
						0.222	0.1875	0.345
26/02/2016	JQ15	2728	6.2	440	88kg N 74S	98	83	
26/02/2016	JQ14	3457	9.3	372	88kg N 74S	83	70	
26/02/2016	JQ16	3843	7.9	486	88kg N 74S	108	91	
		10028	23.4	429		95	80	
14/03/2016	MH	2512	6.54	384	88kg N 74S	85	72	
14/03/2016	JQ8	13791	34	406	88kg N 74S	90	76	
		16303	40.54	402		89	75	
14/03/2016	ST6	4000	8.87	451	88kg N 74S	100	85	
14/03/2016	ST5	7847	21.41	367	88kg N 74S	81	69	
		11847	30.28	391		87	73	
15/03/2016	E5	6553	14.69	446	88kg N 74S	99	84	
15/03/2016	E4	8561	19.88	431	88kg N 74S	96	81	
15/03/2016	E1	6164	12.35	499	88kg N 74S	111	94	
		21278	46.92	453		101	85	
15/03/2016	14	11327	28.23	401	88kg N 74S	89	75	
16/03/2016	37	6600	20.68	319	88kg N 74S	71	60	
16/03/2016	38	5685	18.73	304	88kg N 74S	67	57	
16/03/2016	35	3140	10.05	312	88kg N 74S	69	59	
16/03/2016	32	3098	11.7	265	88kg N 74S	59	50	
16/03/2016	34	5993	18.7	320	88kg N 74S	71	60	
		24516	79.86	307		68	58	
16/03/2016	7	3321	9.9	335	88kg N 74S	74	63	
16/03/2016	9	5834	14.86	393	88kg N 74S	87	74	
		9155	24.76	370	88kg N 74S	82	69	
17/03/2016	24	8267	21	394	88kg N 74S	87	74	
	OSR	112721	294.99	382	88kg N 74S	85	72	

Figures in the red boxes show range of Kg N/Ha applied to OSR fields. From 59 to 111 kg/ha. David commented that in the past they would never have gone above 88 kg/ha as a flat rate.

Note figure in the green box of 85 kg/ha for the total average across all 300ha. This shows a small reduction in total N applied over the previous target rate of 88 kg/ha.