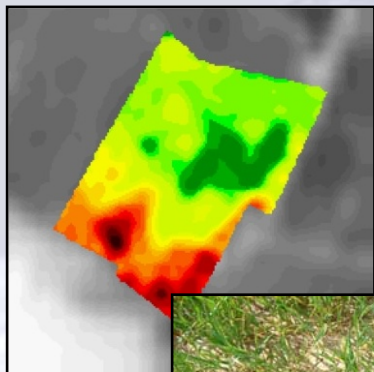




FarmStar System and Examples using AISA Eagle



Gary Holmes, Infoterra Ltd

May 2006

Total Geo-Information Solutions

1

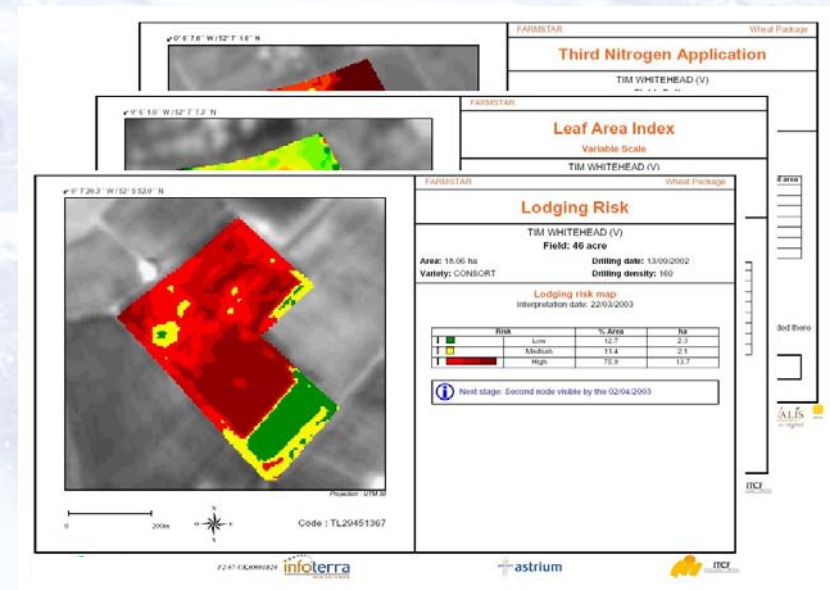
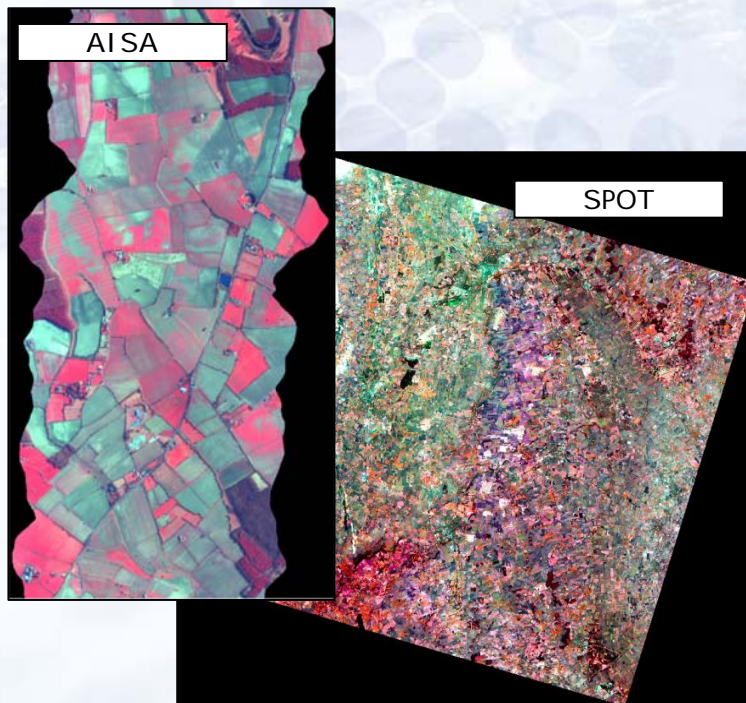


FarmStar Service development & current status

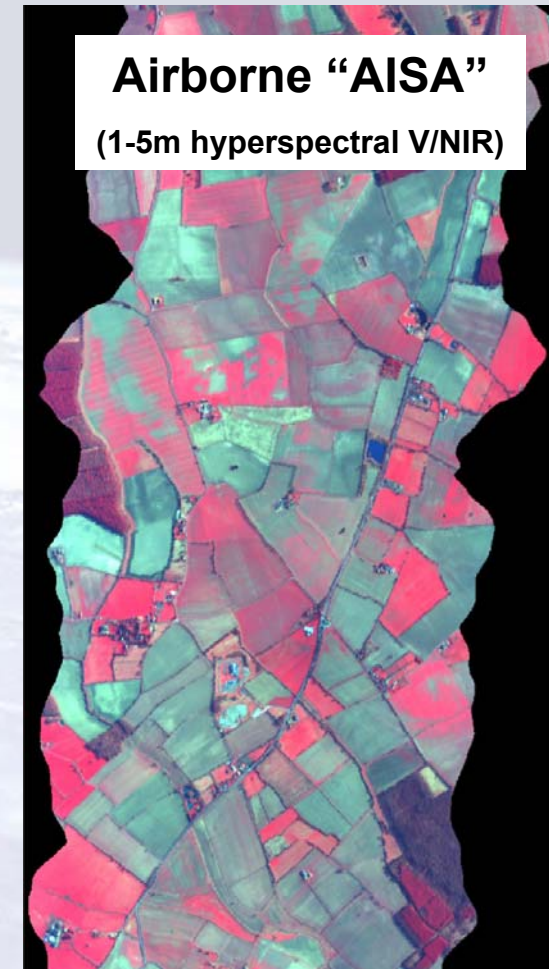
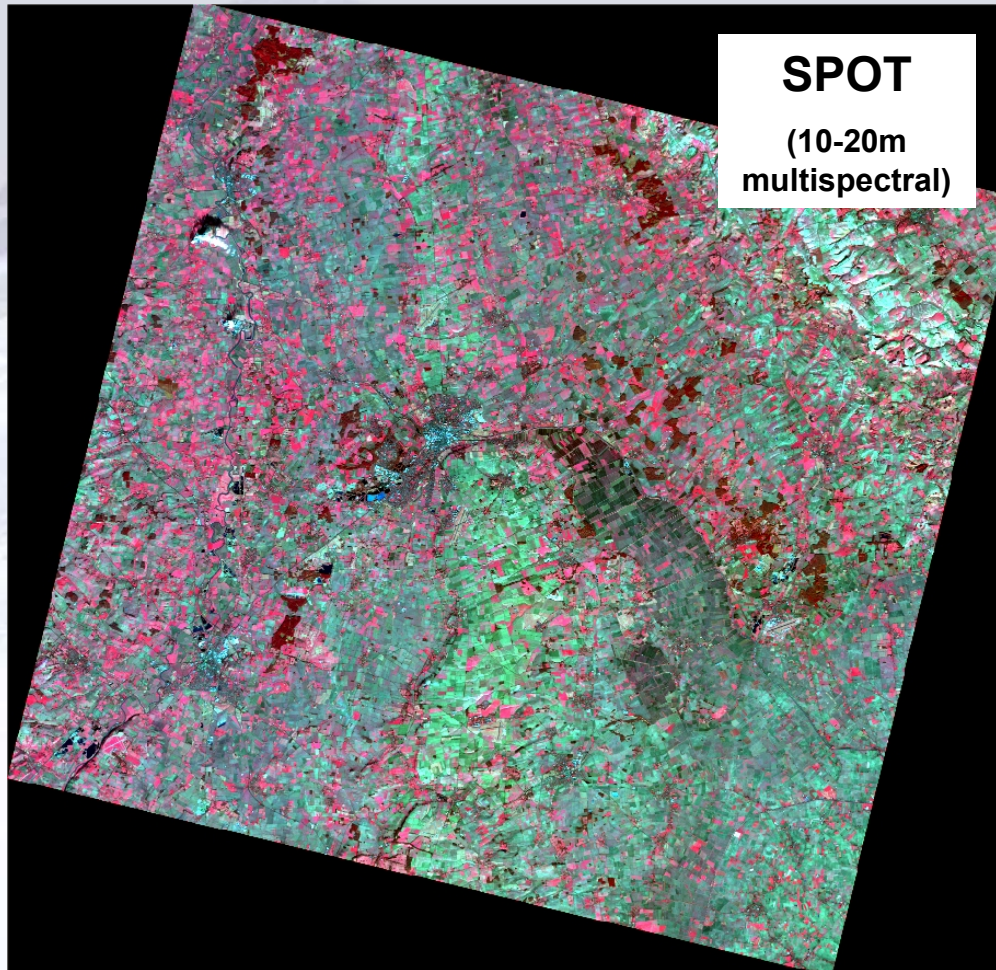
- Developed by: EADS Astrium (Toulouse) – ground segment and services (development since 1996, operational in France since 2002) – now Infoterra France
- Implemented in UK by: Infoterra Ltd (Leicester/Farnborough) – formerly National Remote Sensing Centre
- Status:
 - Fully operational in France (250,000Ha subscribed for this season)
 - Now ready for expansion in UK following adaptation and demonstration campaigns since 2002
 - Also active in: *Germany, Australia, Canada, South Africa*

FarmStar Service concept

- Near real-time maps to farmers and agronomists
- Advantage of viewing all parts of all fields at a glance and objectively quantifying crop parameters
- Combines the best remote sensing techniques with agronomic models and meteorological data



FarmStar Data sources in UK



+ daily meteorological data and field/variety info

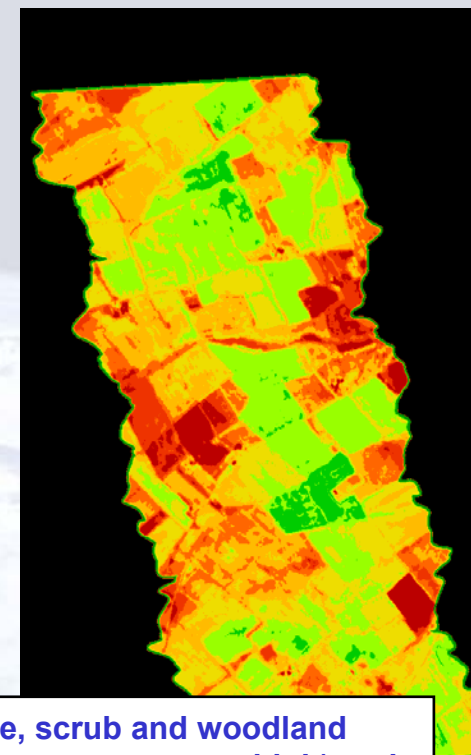
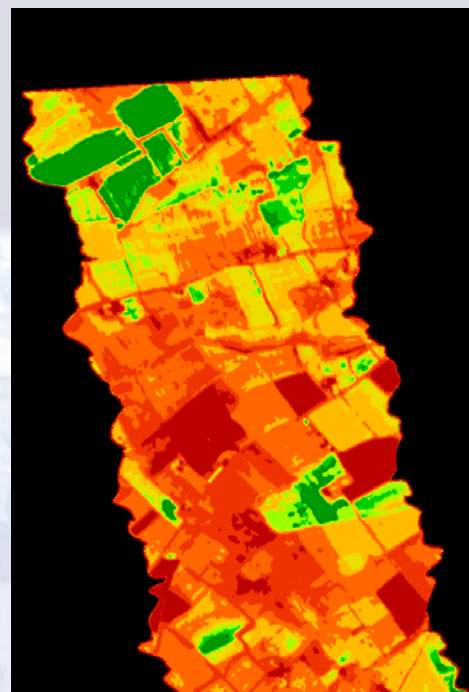
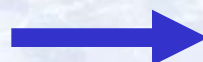


Infoterra's AISA Eagle



- Configured to acquire 11 Vis/NIR channels for FarmStar

FarmStar process



In this flight line in Cambridgeshire there is a mixture of arable crops, bare soil, pasture, scrub and woodland (24th march 2002). Biophysical parameters are estimated for all surfaces (red means low, green means high) and quantitative estimates are used for further processing for areas of interest.

'True colour' image after georectification and atmospheric correction

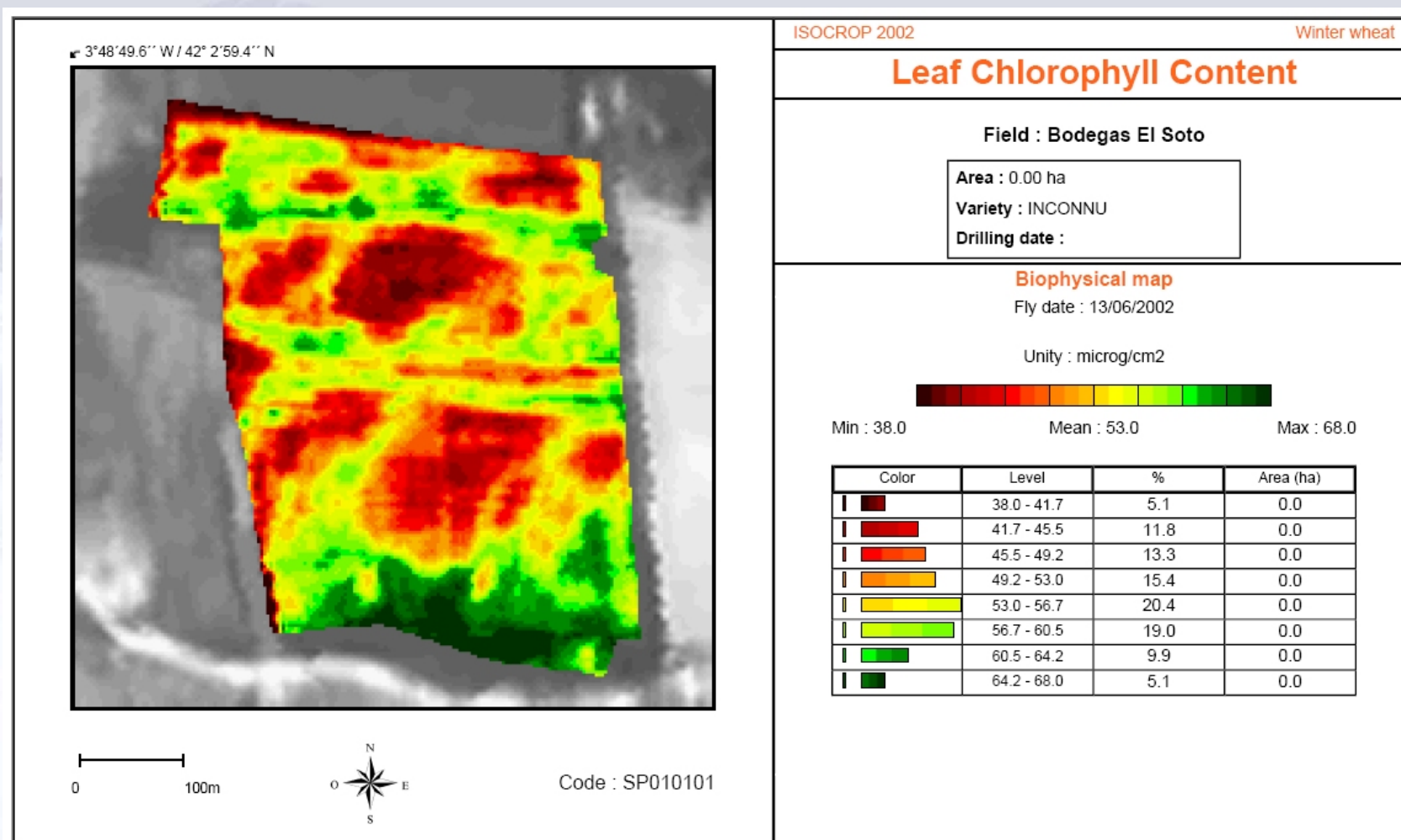
Leaf area index (m^2 of green leaf per m^2 of ground area)

Chlorophyll ($\mu\text{g}/\text{cm}^2$)

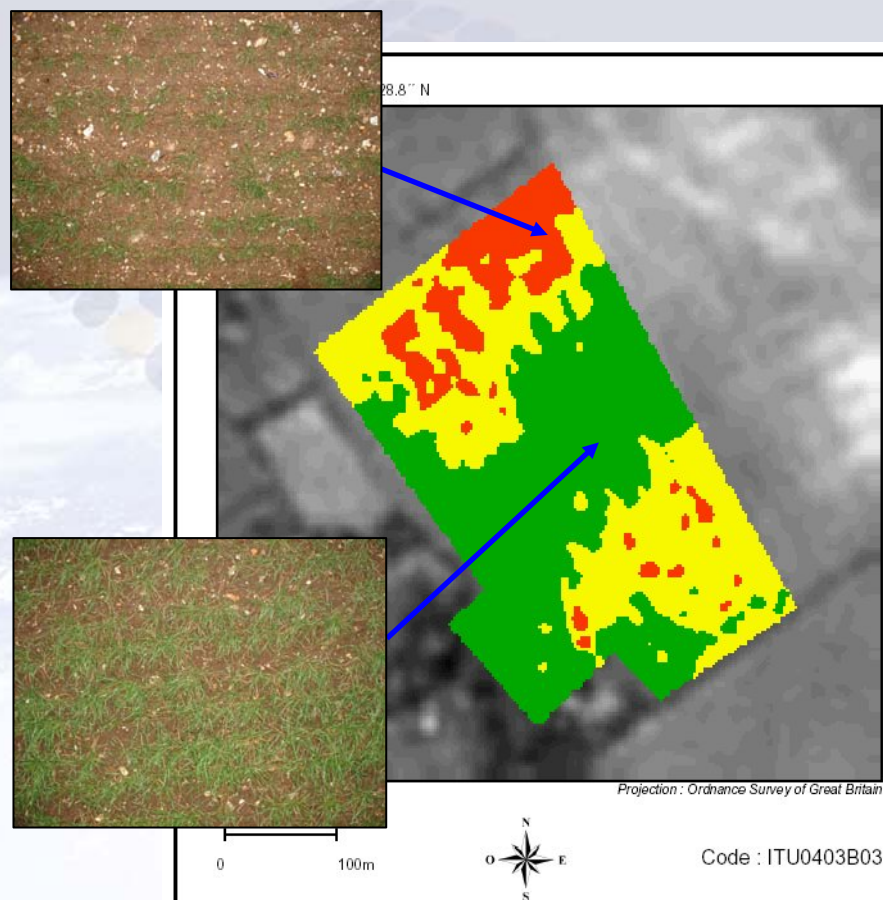
Examples (1): Field-scale Leaf Area Index Map (Wheat, UK)



Examples (2): Field-scale Chlorophyll Concentration Map (Wheat, Spain)



Examples (3): Shoot Density (Wheat, UK)



FARMSTAR

Winter Wheat Package

Shoot Density GS26

Field: F3A

Area: 12.0 ha

Drilling date: 20/09/2003

Variety: Napier

Drilling density: 350

Shoot density map

Interpretation date: 10/02/2004

Shoot density (shoots / sqm)	% Area	Area (ha)
Very low (< 150)	0.0	0.0
Low (150-500)	12.6	1.5
Optimal (500-700)	38.9	4.7
High (> 700)	48.5	5.8

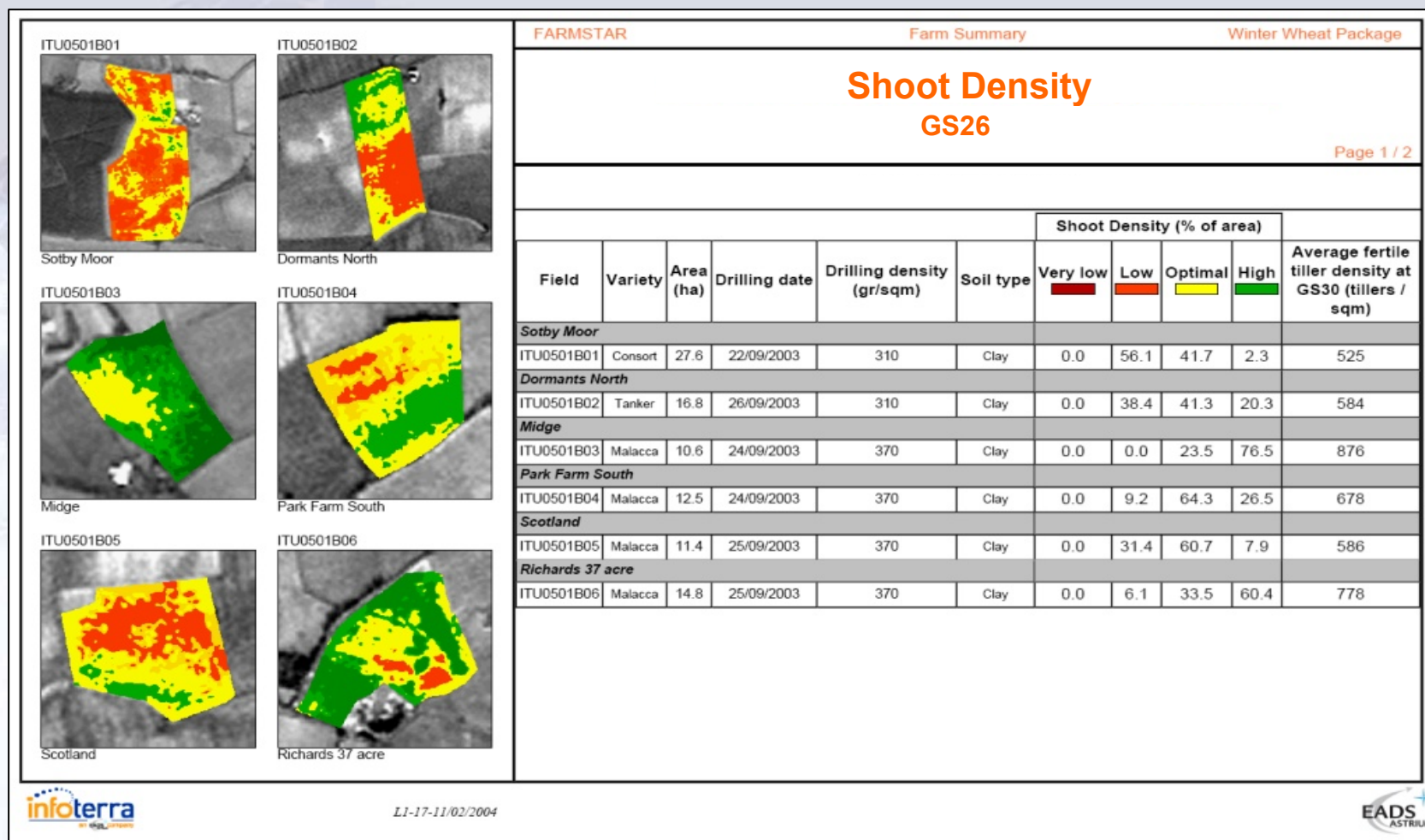
Predicted average fertile tiller density at GS30

736 tillers/sqm

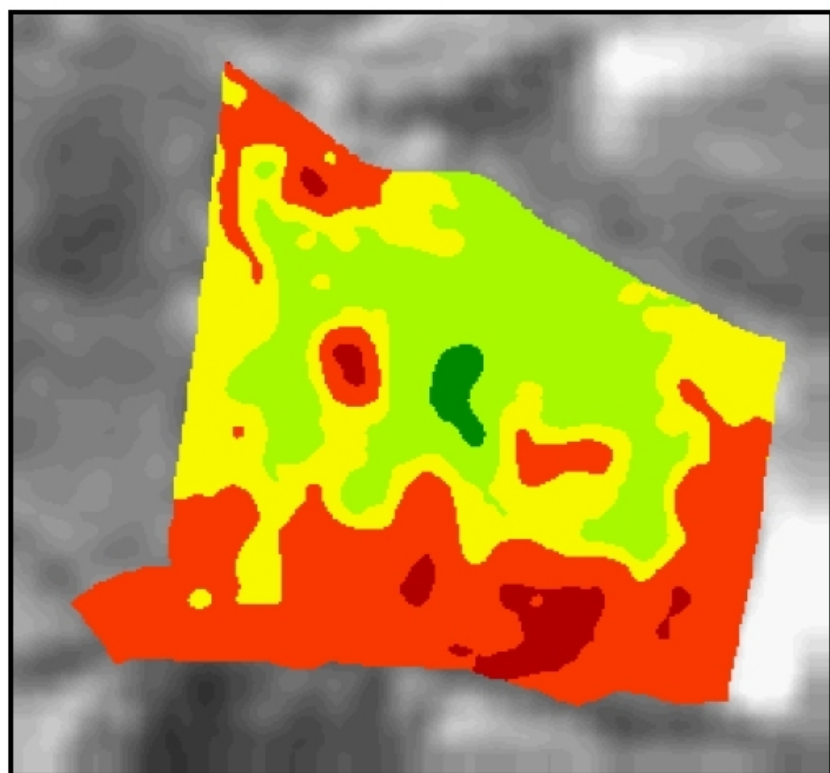


Next stage: Beginning of stem elongation by the 22/03/2004

Examples (4): Shoot Density (summary format) – wheat, UK



Examples (5): Fertile Tiller Density (Wheat, UK)



Projection : United Kingdom

0 200m



Code : UKA0301W03

FARMSTAR

Winter Wheat Package

Fertile Tiller Density

GS30

Field: E5

Area: 25.5 ha



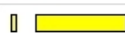


Drilling date: 18/09/2004

Variety: Claire

Drilling density: 200

Fertile tiller density map

Interpretation date: 28/04/2005

Fertile tillers density (tillers / sqm)		% Area	Area (ha)
	Very low (< 200)	3.9	1.0
	Low (200-500)	38.7	9.9
	Optimal (500-700)	27.5	7.0
	High (700-1000)	28.6	7.3
	Very High (> 1000)	1.3	0.3

Average fertile tiller density

545 tillers/sqm



Next stage: Flag leaf just visible by the 12/05/2005

Examples (6): Lodging Risk (Wheat, UK)

