agrovista
decision support

Precision Farming Services

growing through ***innovation***

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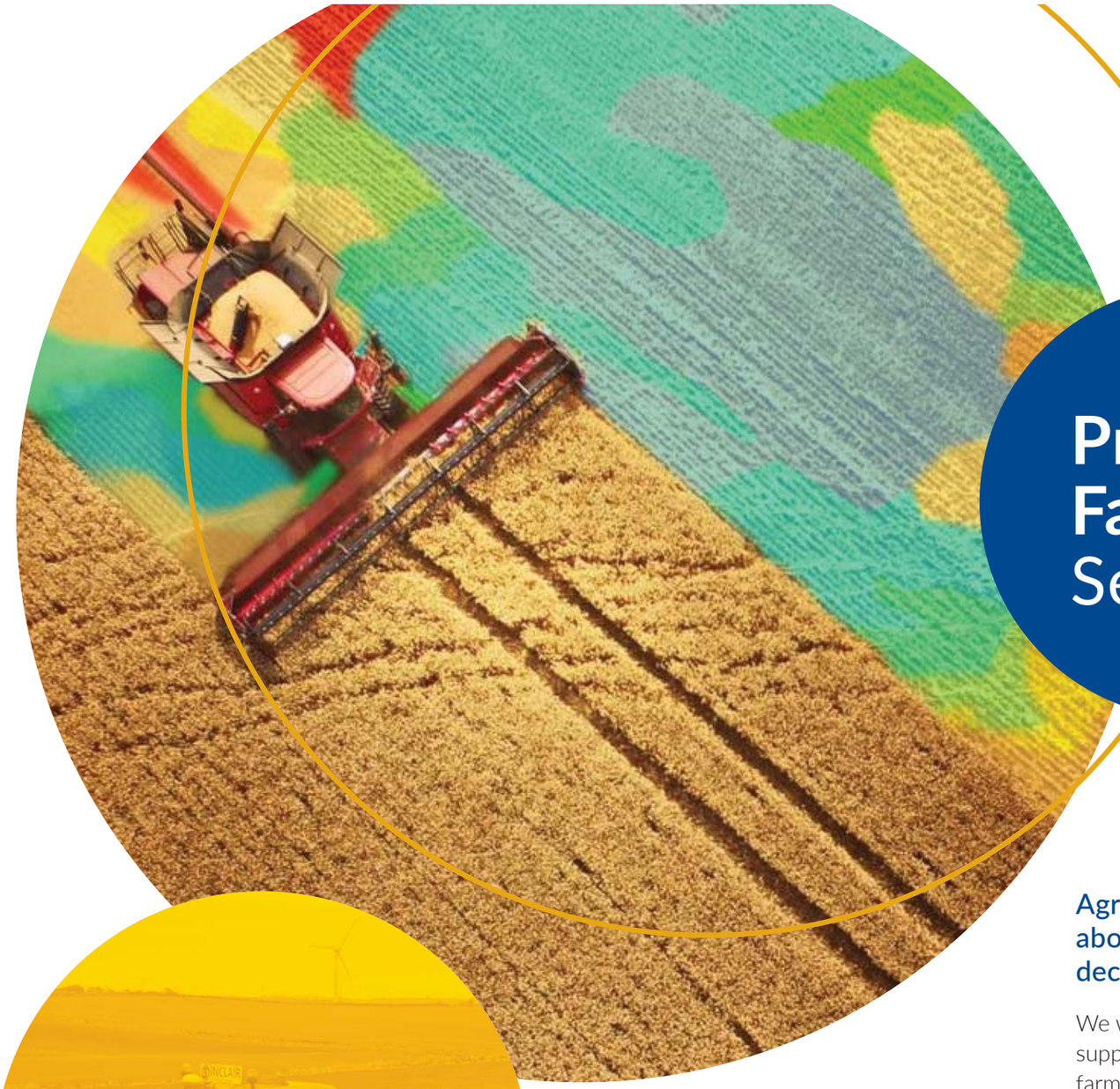


agrovista decision support

Precision Farming Services

Agrovista Decision Support is about helping you make the right decisions for you and your farm.

We want to keep things simple by supporting you to make informed precision farming decisions with clear data backed up by expert agronomist knowledge.

Despite all the information out there, we believe this doesn't need to be an overly complex or expensive addition to your farming practices.

Most importantly, its about working together to ensure you achieve the best margin possible for each field.

Soil variation scanning

Soil variation scanning is the entry level soil scan offer from Agrovista, offering some very useful information at a competitive cost.

Service use:

- Variable rate seed
- Slug pellet zones
- Nutrient sampling zones (soil sampling not included. Please see page 14 for more details)

Soil variation scanning uses one of two types of technology – electromagnetic induction (EM38-MK) or electroconductivity. Both services create the same variation map.

The operator drives up and down the field parallel to tramlines. In a 24m tramline system they will travel at 12m intervals and in a 36m system at 18m, avoiding travelling on tramlines.

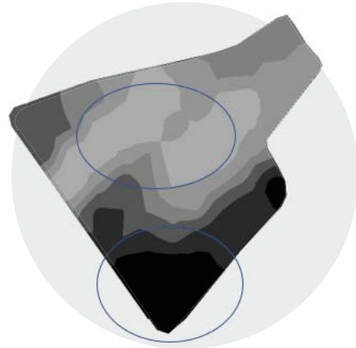
Good soil moisture levels are required to capture the best data and each field must be scanned all at once and not across different days.

Making decisions on field management zones is very important and there are several things to consider.

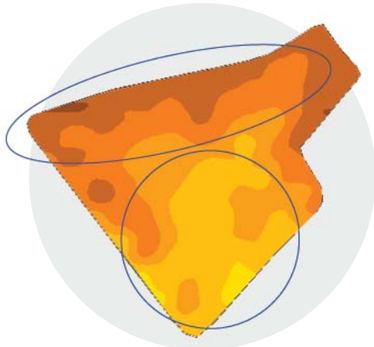
1 Electronic data

- EM and EC scanning give accurate soil variation

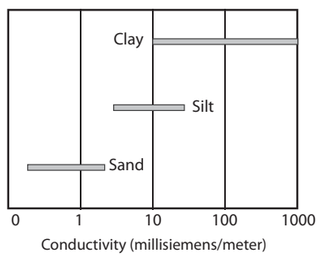
- Variance in raw data. This image clearly illustrates obvious areas of change. The pink area in this image is the lightest part of the field and dark blue is the heaviest area.



- Elevation will give a indication of where nutrients will run off and where water will flow. The darkest area is the high land and light area is the lowest ground.



- Variance in contoured soil type data. The yellow area indicates the lightest part of the field and the brown area is the heaviest part.

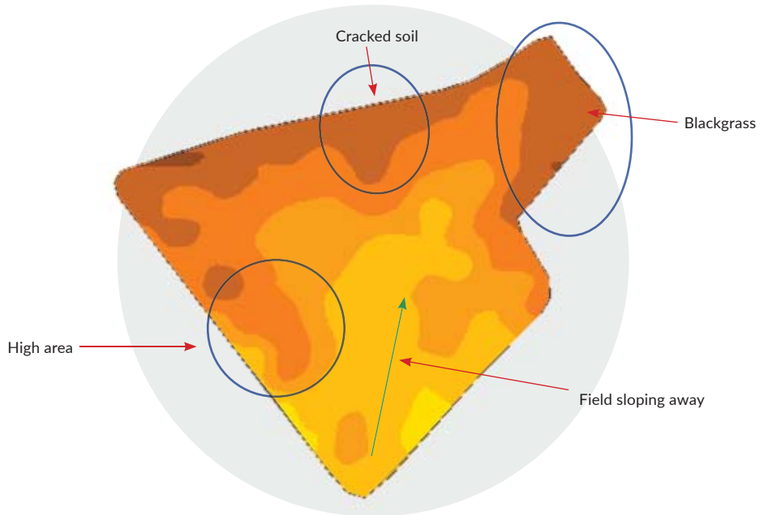


- As a very basic approach we can look at millisiemens values, which is the measurement of the conductivity expressed as mS/m. This is not an exact science but if the EM scanner is calibrated well it will provide a rough indication of soil type (exact data once ground truthed).

This data alone will produce a very good idea of soil variation.

2 Visual notes

While scanning the operator keeps an eye on field appearance. Are some areas dusty? Are there cobbles, or is the surface rough? Are there wet spots? Are there colour differences in the stubble?




High area


Field sloping away


Blackgrass


Cracked soil

3 Farmer and agronomist knowledge

Farmers and agronomists have a wealth of knowledge about their fields. This can provide key information regarding why a soil type behaves as it does.

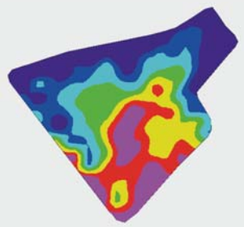
For example, two identical soil types within a field can yield completely differently. Those managing the farm may already know why.

4 Ground truthing

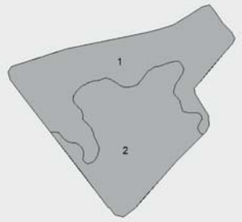
Obtaining a soil sample from a high and low millisiemens area will provide an exact soil type that provides an accurate indication of soil type across the field. In the example on page 5 the lightest areas of the field are sandy clay loam and the darkest are clay loam. This data can be used to compare fields across the farm rather than just variation within the field (additional cost).

EM management zones decided

These zones are created using some or all the following - soil type contour, raw variation data and elevation data.


Raw data variable rate seed zones


Soil type and grower-managed seed zones



In this case the nutrient zones have been decided on millisiemens and elevation

This service is compatible with the Agrovista Portal

Standard service includes:

- EM soil variation scan
- First year VR seed maps
- Data interpretation.

Please ask for an EM example report to see how your report would look.

Veris U3

Veris U3 scanning is the next-level soil scan offered by Agrovista. The Veris U3 is a soil scanner that is towed by a pickup at speeds of up to 16kph, offering accurate and quick measurement of organic matter, electroconductivity (to ascertain soil type) and topography in one pass as continual sets of data.

This service offers more data than standard variation scanning, including nitrogen leach risk, water holding capacity, organic matter and CEC (cation exchange capacity).

The data collected on its own will give very good indications of a soil's characteristics. Combining individual data sets can provide very good indications of a soil's health and how it may perform under certain conditions.

Once data has been collected and calibrated with laboratory results, zones can be created using multiple data sets from the Veris U3 to show:

- Optimum planting zones
- Nitrogen leaching zones
- Nutrient lock up zones
- Water capacity zones
- Organic matter zones
- Soil texture
- Land topography
- CEC (cation exchange capacity)

This data can be then used to manage inputs and aid investigation work into low-yielding areas of the field.

The Veris U3 will collect information about the land it travels over on a particular day. However, the main attributes of soils do not change much over the years.

Even where high organic manures are used frequently, it could take up to 10 years to see slight changes in organic matter and soil texture .

An organic matter sensor uses soil brightness to detect the OM level. Samples are taken in field for laboratory analysis and Veris calibration.

Electroconductivity discs create a circuit in the soil from one end of the machine to the other. The resistance is measured and the soil type can be determined from this. The wider apart the discs, the deeper the conductivity map will be.

Please ask to see a Veris U3 example report.

Standard service includes:

- **Veris variation scan including EC and OM**
- **Calibrated data**
- **Standard maps – soil variation, OM, slope, curve, nitrogen leaching**
- **Precision files for soil variation, OM and one-year OM application/ seeding maps**
- **Data interpretation**
- **Nutrient sampling zones (soil sampling not included – please see page 14 for more details).**

Soil health

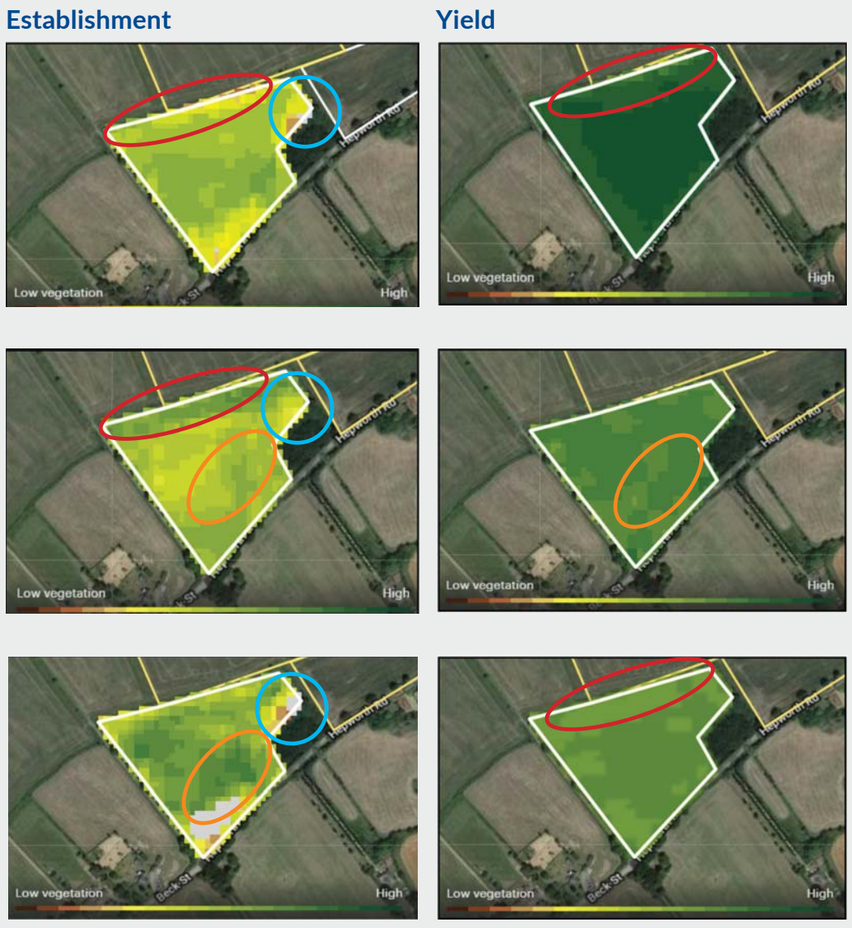
This is designed to help agronomists and growers understand in-field variances to better manage the land.

This service starts with a soil variation scan. See pages 4-7 for more information.

Biomass images are then taken from satellite data to see whether establishment and yield are affected by soil type.

- It is important to pick up trends within fields. We will take up to six images from over three years to identify potential yield and establishment trends (yield data will be used in place of satellite data where applicable).
- If trends do show, these can be compared with soil type to establish where to look for limiting factors within a field.

Once these reports have been created it is then time for a discussion between the grower and agronomist.



Standard service includes:

- **EM soil variation scan**
- **First year VR seed maps**
- **Data interpretation**
- **Soil sampling not included – please see page 14 for more details.**

Grid mapping

Grid mapping is where precision farming started in the UK. It is a basic yet very important part of precision farming.

Service use:

- Variable rate P, K, Mg and pH

The process:

- Map the boundary.
- Set sampling points (generally 1ha but can be tailored). These are normally set in the office to ensure points are not too close to areas such as boundaries, pits and trees.
- The operator is guided to each sample point to collect 16 sub-samples to make the 1ha soil sample. The operator logs the point, which might be different to the pre-determined point due to factors that could lead to inaccurate readings such as cattle feeders, muck heaps or wet holes.
- Samples are logged and then sent to the laboratory.

Information the decision support team need.

- Type of analysis – standard is S1 (P, K, Mg and pH). Further nutrients can be added for an additional fee. Two popular additions are Ca and OM.
- Cropping – to create a fertiliser recommendation the decision support team require crop information, yield, target pH, muck information and straw policy.

Once these reports have been created it is then time for a discussion with the grower and agronomist.

Field Details										
Name	Reference Number	Area	Current Crop	Previous Crop	Target pH	Additional Details	Straw Policy	FYM Type	FYM Rate	Yield Goal
			Winter Wheat	Winter Oilsee	6.2					

Once all the above has been completed we can compile a report.

Key points to view in the results table:

Min-max and average index
The average index would be the equivalent to a standard whole field sample

Total field tonnages

Field No.	6				Calc Area Ha		8.92		Soil Type = Standard Mineral			
Yr 2018/19	Silage									Yield Goal = 3 Cut		
	Mg/l			Index			Kg/Ha Product			Target		Fertiliser
Nutrient	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Index	Frequency	Tonnages	
Phosphorus	22	20.3	15	2+	2	2-	108	82	72	2	1st Cut	0.73	TSP
							54	54	54		2nd Cut	0.48	
							33	33	33		3rd Cut	0.29	
Potassium	73	66.3	55	1-	1-	0+	233	215	208	2	1st Cut	1.92	MOP
							200	188	183		2nd Cut	1.67	
							133	133	133		3rd Cut	1.19	
Magnesium	202	180	151	4	4	3+	0	0	0	1-	Triennial	0.00	Keis
pH	5.8	5.7	5.5				7500	7500	7500	6/5	Triennial	66.86	Lime

Min-max and average application rate for the field

Target index
(presumed P2 K2 Mg1-)

Frequency of application
(how often fertiliser should be applied)

The cropping form should be updated yearly for new recommendations. Four years of recommendations are supplied with this service. Application maps can be made for all major manufacturers' equipment. Your decision support specialist can advise on file type and format. This service can also be loaded to the Agrovista Portal.

For a greater depth of knowledge, it is suggested that a broad spectrum Solvita analysis is carried out for the whole field.

Please ask to see an example report for grid mapping.

Standard service includes:

- **P, K, Mg and pH maps**
- **Four years of recommendations**
- **Data interpretation**
- **Application files**
- **Soil variation scans NOT included**

Zone mapping

This service combines soil variation scanning and grid mapping. Zone mapping starts with EM scanning and adds nutrition to the package.

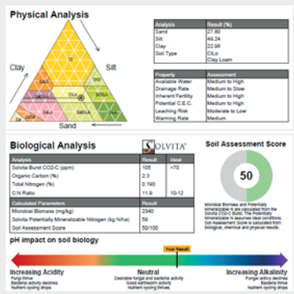
Basing soil sampling on soil variation scans is not only a more effective use of the soil scan but also adds greater accuracy to your nutritional variation.

There are two ways to carry out this sampling, either taking one sample per zone or by overlaying a hectare grid in each zone. Some soil types hold certain nutrients better than others and a W pattern within a zone will show this. However, variation can also occur within a particular soil type, therefore overlaying 1ha grids over the soil zones is the most accurate way to determine nutrient levels.

Each sample will still consist of a minimum of 16 cores. One sample per zone would require either a strategically placed point or a W pattern.

This particular field had two W patterns in it, one in each soil type.

The resulting maps show where nutrients are likely to change due to soil type (eg phosphate is likely to be higher on lighter land)



For a greater depth of knowledge, it is suggested that a broad spectrum Solvita analysis is carried out for the whole field.

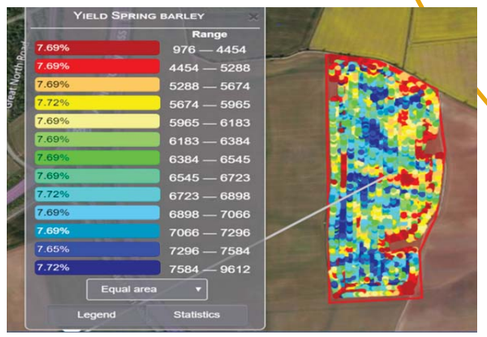
Standard service includes:

- P, K, Mg and pH maps
- Four years of recommendations
- Application files
- This service does NOT included variation scanning

Yield map cleansing

Service uses:

- Overall crop view
- Variable rate seed
- Variable rate P and K
- Problem solving.



Combine yield data is one of the best ways to assess overall crop health. One issue with the data is that there are often inaccuracies.

The decision support team will take the data and cleanse it, removing header lifts and combine turns.

PCN mapping

Service uses:

- Cyst and egg count
- Speciation
- 49 cores/ha
- Nutrient analysis can also be added
- 100 or 200g soil analysed.

Standard 49 Cores/ha

Field no.	12 Acre								
Yr 2015/16	Calc area = 6.37 Ha						Samples = 6		
	Count			Overview			Treatment		
Pest	Max	Avg	Min	Max	Avg	Min	Kg/Ha product		
PCN cyst count per 100 grams	10	4	0	Low	Low	NF			
PCN eggs per gram	14	6.6	0	Mod	Low	NF			

Order Number	Reference	Cysts /100g	Dead	Half Full	Full	Eggs /g	Category	Comments
E194058/01	17AC A 1	5	1	0	4	8	L	Low
E194058/02	17AC A 2	1	1	0	0	0	EC	Empty Cysts
E194058/03	17AC A 3	0	0	0	0		NF	Non Found
E194058/04	17AC A 4	10	1	2	7	14	M	Moderate
E194058/05	17AC A 5	0	0	0	0		NF	Non Found
E194058/06	17AC A 6	8	0	1	7	12	M	Moderate

Biomass imagery

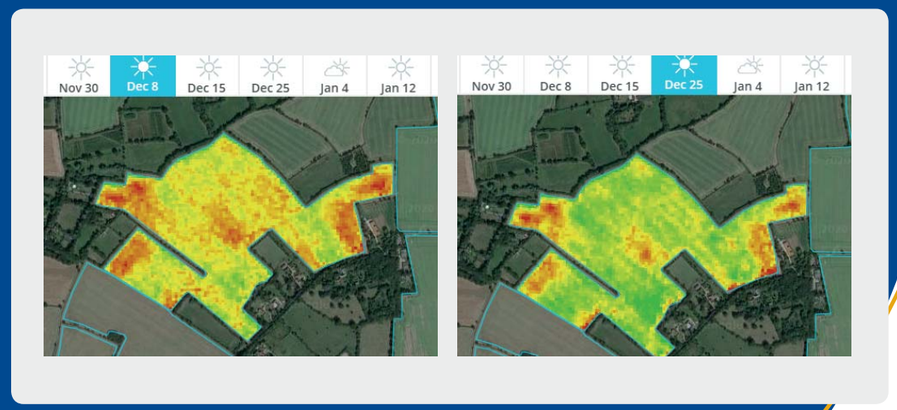
Service use:

- Variable rate nitrogen
- Variable rate PGRs
- Intelligent crop walking.

Satellite images provide us with NDVI images that indicate how photosynthetic a crop is. To receive biomass images, we need field locations. We will then load your fields onto an online portal where you can view new images weekly.

Intelligent crop walking

View and compare NDVI images to see how crops are performing throughout the season. Images can be viewed on an app.



These maps can also be added to the Agrovista Portal. This data can also be used for variable desiccation and variable PGR applications.

Variable rate Nitrogen

Variable rate nitrogen is a simple process you enter the average rate you wish to apply to the field and enter the number of kilograms you wish to vary that field by and it will calculate the amount of product you need.

Then there is a simple download button to get you application maps.

Variable rate PGR's

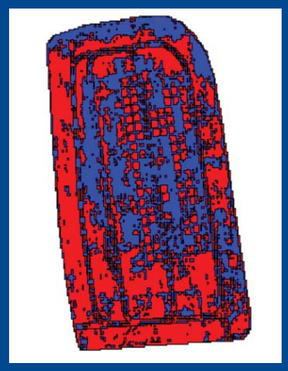
Using GAI imagery in oilseed rape can give a more accurate recommendation for both variable rate Nitrogen and variable rate PGR's.

This service will offer a multi-layer compaction map (up to five layers).

Drone imagery

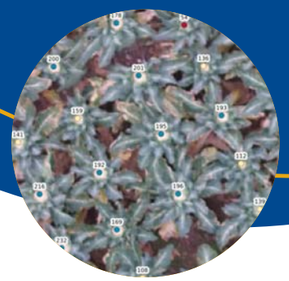
Service use:

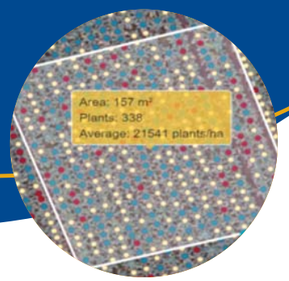
- Plant health – determine crop variation, identify zones, variable rate from biomass, blackgrass mapping, variable rate glyphosate, crop establishment.
- **Plant count** – establishment, crop variation, count comparison, seed viability.
- **Plant size** – yield prediction, crop variation, optimise harvesting, ability to forward sell crop more accurately.
- Farm aerial imagery
- Weed mapping

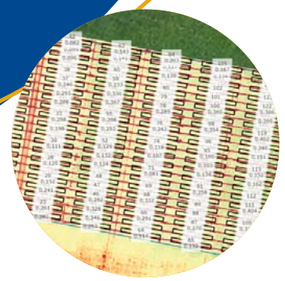


Blackgrass

Crop







Plant sizing

Plant count

Trial plot health

Variable rate controllers

The Agrovista Machine Control (AMC) is our new GPS system

Load your variable rate maps and let the AMC take the reins as you drive around the field.

With variable width and adaptive rate control, and an added option for guidance, the AMC is a cost-effective solution for most tractors and applicable equipment.

There is also an option for the AMC variable rate only system.

Features

- Compact 7" LCD display
- Guidance option
- Built-in terrain compensation
- Headland guidance
- Straight line and curve AB lines
- Field area measurement and field recognition
- Wi-Fi and Bluetooth connectivity
- Job recording
- Optional auto shut-off

Example variable rate application map

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