

LBS im Fieldstar system

MORTEN TOFT, RANDERS, DÄNEMARK

Abstract:

Fieldstar system offers itself as an open vehicle for data transport for all partners in the precision farming environment and as a complete system with established products in different areas of precision farming. It is one of Fieldstars primary objectives to establish a de-facto industry standard of communication based on the LBS for the precision farming market.

1 The emergence of LBS and the Fieldstar evolution:

Fieldstar is the tradename for the AGCO cooperation Precision Farming (PF) system. Further, it is the first and most complete PF system offered in Europe that aims to address the problems particular to the European agribusiness. The Precision Farming environment is in constant development, and so is the Fieldstar system. With the launch of the Fieldstar system in 1990, a very pragmatic approach was taken. Based on the assumption that yield variations are constant, it is possible to divide fields in different management zones based on yield maps alone. With this knowledge, management should be able to explain why variations occur and take corrective measures or using inputs according to potential outcome.

Illustration: Fieldstar system 1990



During the period from 1990 to 1995, Fieldstar system was exclusive on the market and pioneered yield mapping technology. Today, it is the most widely used system in Europe and has managed to map app. 900.000 Ha. During this period and from the large amount of data, it became clear that more than 50% of the mapped area displayed large variation in yield from year to year, which had no co-relation to previous years and therefor could not be used as identifier of different management zones. This made it necessary to add data to the system such as soil, nutrient, topography and other data for decision support. The addition of the many data from different sources have continuously changed the requirements of the system and made it next to impossible for one system to encompass all requirements from the market. This has also led to many changes in strategy for the Fieldstar system, where the original intention to be able to fulfil all functions in the system, was abandoned.

Illustration: Fieldstar system 1995



The Fieldstar system from 1995 is perhaps best described as an all purpose vehicle that continuously drive around in the Precision Farming circle. Each actor in the market may load on - or receive data according to niche or expertise. Data import and export are made available in standardized formats. The evolution of the system continues with a continued increase on demands for functionality of the system. From the beginning, with the assumption that precision farming could be based on historic data alone, there is now a widely different scenario, where the realization is that each farm or region has its own and different parameters compared to the neighbor. One of the major problems identified in this scenario, was the lack of standards. The first full circle using exclusive Fieldstar products was closed in 1995 and launched as a commercial product in co operation with Amazonen. The aim was to lead the industry in setting a standard and offering it to our industry together with a consultancy service that should lead it to become an industry de-facto standard.

This strategy was again changed with the emergence of the DIN 9684/LBS.

The choice that faced Fieldstar was not easy. Since Fieldstar was the industry leader, we could aim to set the standard by - as already done - open our architecture or we could opt to support a known international standard, in this case, the only one available, the LBS. The choice was for a partial implementation of the LBS. This decision was based on a number of reservations, particular with the part 4. The most important factors for this solution was that we could secure a backwards hardware compatibility, if we at a later point should need to implement the part 4 and a significant reduction in development resources in doing so.

For product management, the scenario from 1995 to 2000 may be described as a very difficult period. The development of both technology and experience with the system is moving much faster than engineering can follow and as a result, products do not match the requirements of the market since the goal line is continuously moving from the onset of the development programs. Further, a large portion of the reservations originally identified about the part 4, proves to be correct. The LBS is introduced by a number of companies, but each with their own dialect an unable to work together.

This problem is well illustrated in the precision farming scenario of today where the circle since 1995 has expanded further to encompass more functionality's and partners, but still without a firm standard for communication.

Illustration: Fieldstar system 2000



The Fieldstar system of today will allow the user to choose his level of ambition according to need and potential. He may choose to build management around historic data, seasonal variable data or a combination of the two.

2 The Gap - Europe and America

The problems of standardisation and product portfolio does not end there however. During the 90ties, distinct differences in market development and products between America and Europe occurs as a result of a completely different need for the systems and different market structure. Here are just a few to be mentioned:

Europe:	Small farm structures Intensive agricultural practices	USA:	Large farm structures Extensive practices
	16 Languages and legal barriers – More than 1000 implementmanufactures PC literacy not widespread		One Language A few hundred PC literacy widespread

This list goes on for a long time.

Suggested because of this, the American John Deere and CASE opt for a stay out strategy for the European market. This leaves the markets open for the European companies and retrofit manufactures, but also a market without a clear leadership for the standardisation process.

3 The Finalisation of the LBS

The continued problems with the standardisation issues has been brought into a new perspective by the emergence of the ISO 11187. This should have been the forum to set the global standard that everybody wants, but which has taken a size - to please both sides of the ocean, that makes it non-operational – or at least with a future like the current LBS – that more non-compatible products will find its way into the market claiming the same standard.

This has caused the two market leaders in Europe – Fieldstar / Fendt Vario and Claas Agrocom to arrive at a programme to harmonise elements of their versions of the LBS standard. This step will be finished in 2000 and the result made available to our industry.

This move is not to be seen as a hostile intent towards ISO, but as a logic step towards a true global standard and while we work towards this ultimate goal, we will have an operational standard for our current marketplace with a guaranteed backwards compatibility.

Should one or more of the global players decide not to implement ISO, we will still be able to realise our current ambitions through the LBS.

Fieldstar products:

The characteristic of the markets, which such desperate differences and where many of the techniques and ideas are of an experimental type, makes it very difficult to establish which products will be accepted by the market and find its future nice. This has caused Fieldstar to focus mainly on two areas – registration (yield mapping) and application execution – product areas where there is a natural stronghold for AGCO's core products and expertise.

Category 1. Registration

The Fieldstar system has 3 fundamental requirements for collecting data:

1. Automatic gathering of data 2. during an existing operation 3. in large quantities.

This has so far restricted the Fieldstar product portfolio in the registration area to yield mapping, but future developments will expand the product offering through integration with the tractor CAN-bus and use of optical registration, NIR and other opportunities that might arise.

Yield mapping very much continues to be the centre point of Precision farming since it is a good tool for evaluation and deciding on weather entering the precision farming technology is profitable and a requirement for controlling the results of a variable rate application.

Category 2. Analysis

Today, the analysis of the gathered data presents the largest obstacle for market breakthrough for precision farming products.

A number of key issues concerning this area

- End-user time requirement
- End-user IT expertise

- Data compatibility
- Interpretation of data
- Data base management

Because of above, Fieldstar's approach to this segment is very basic:

"Fieldstar software and its functionality must not exceed what we can teach any end-user (Windows capable) in one day".

This approach is designed to invite all end-users to enter the precision farming world without difficulty. Following a successful evaluation and perhaps a realization that further data analysis are required, the Fieldstar data may be exported to any local partner for further processing and decision making. Fieldstar software has implemented the LBS / DIN 9684 interface for data export and import. A further integration to existing software management and GIS-systems is an ongoing process.

In this respect, the LBS standard has proven to insufficient and supplements from other areas of the PC world, such as SQL language will be installed to build a strong alliance with softwarehouses all over Europe/World. Of major importance is that the strategy remains that Fieldstar is a system with an open architecture that will allow the end-user to decide which local partner he chooses for software analysis.

Category 3. Execution

This area has been/is being addressed through the above discussion on LBS and ISO 11187 standardization programs. Therefor it is a Fieldstar strategystatement:

"It is Fieldstar's mission to establish an open de-facto industry standard for tractor implement communication based on the LBS DIN 9684."

Further, Fieldstar will continue to work towards a true global standard.

Fieldstar system for application execution has been available since 1996. It is very reliable, with a simple user interface and may be used with any tractor make on the market. Perhaps much more important is, that it has achieved a widespread support from the industry with established co-operation from a long range of leading manufactures which takes it a long way towards the first goal – a de-facto industry standard. On the coming Fendt Feldtage here in south of Germany on the 12 and 13th of September, there are 12 implements with Fieldstar LBS jobcomputers to be seen in operation from all major implementmanufactures in Europe.

A more comprehensive list may be found on WWW.Fieldstar.dk

4 Fieldstar in the future

Looking ahead into the next 10 years, Fieldstar will continue to be an evolution and the list of partners with LBS / Fieldstar compatible products will grow. The Fieldstar technology is not only covering the Precision Farming area, but has spread out to a number of related areas, all covering the same technology such as:

- Implement control and monitoring system
- Sustainable agriculture
- On-line sensors
- P.C. Software integration
- Fleet management / steering guidance / Telemetry systems

New sensor technology and our understanding of them is a never ending story. The fundamental part of the Fieldstar system is that it continues to grow and adjust to the needs of own, current and future partners needs. This development is secured through the system being an integrated part of a mainliners standard product offering such as combines and tractors and through the Fieldstar strategy of co-operation and setting standards.