



EASY – Efficient Agriculture Systems

ISARIA CROP SENSOR



CROP SENSOR.

Four eyes see more than two.



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Site-specific management.

Whole-field management is still the predominant farming system in most regions. In this approach, the application rate of fertilisers and crop protection products is not adjusted to suit varying conditions within the field.

Variability of the soil and different crop growth rates within a field mean that it can be divided into a number of distinct areas. These variations can result in adverse ecological and economic impacts which are characterised by poor nitrogen balances and large fluctuations in quality and yield. Site-specific management, also known as precision farming, can help to overcome this problem.

The aim of conventional precision farming is to respond to differing conditions within the field (growth, nitrogen supply, soil type) by adjusting application rates.

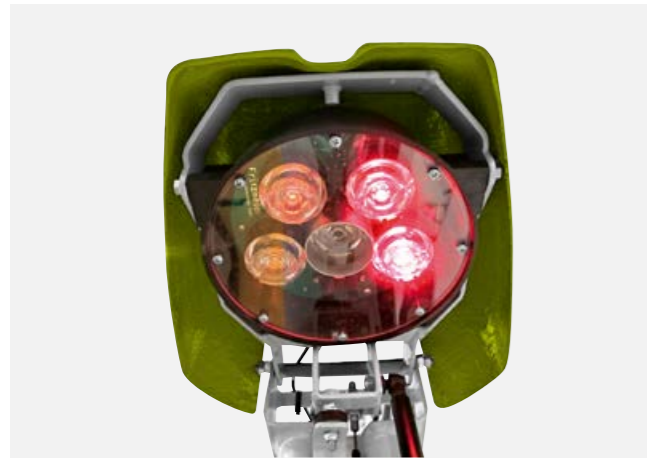
The challenge is to achieve better nutrient distribution within a field and to apply the optimum level for a specific site. Only the precise amount required by the crop at that site is applied. This increases yields and saves on fertilisers and crop protection products, while at the same time preventing nutrient accumulation and thus protecting the environment. The greater the variability of the site, the greater the benefit of site-specific application systems such as the CROP SENSOR.

Easy to install.

The CROP SENSOR from CLAAS is easily installed at the front of the tractor. Front mounting has many advantages.

Firstly, the sensors are further from the application point (fertiliser spreader, spray boom), giving a longer response time which improves the accuracy of application. They are also less affected by dust as the measuring point is in front of the wheels when the vehicle is moving. Two different mounting adapters (3-point adapter for the front linkage or universal adapter for most front weights) allow the system to be fitted in just a few minutes.

Front mounting allows the sensor heads to be mounted on a frame. Precise crop measurements are therefore obtained vertically from above rather than at an angle from the side. This gives more accurate measurements.



High-precision sensors.

The CROP SENSOR from CLAAS is based on an active measuring system with four high-performance LEDs. These LEDs enable the sensor to be used 24 hours a day as the system is not affected by ambient light levels or time of day. For this reason, there is also no need to re-calibrate the system.

Operating at a frequency of 10 to 2000 measurements per second, the system covers a large measurement range without saturation, depending on environmental conditions. Its high measurement frequency enables it to take several measurements from individual plants, creating an extremely accurate picture of plant status as a measured value.

Naturally, the measuring system can be used in any variety and vertical deployment in the crop enables it to detect the leaves and biomass more effectively. This allows better scanning of individual plants.

The parameters measured: biomass and N index.

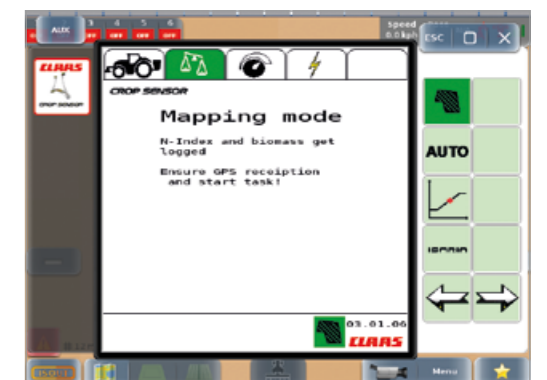
The biomass-related measurement provides information about crop density. Thanks to a biomass threshold value, the system can respond very effectively to extreme situations such as drought or frost damage.

The N index is a vegetation index which is based on the green coloration of the plant. The nutrient supply to the crop is calculated from the N index, irrespective of variety, time of day and ambient light intensity.

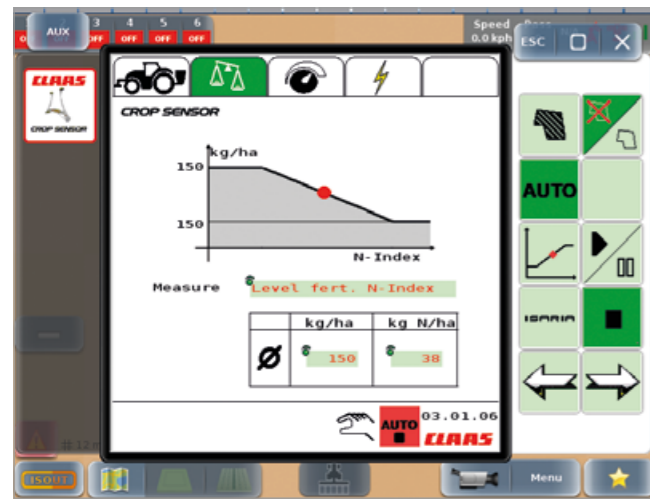
The N index serves as a basis for nutrient requirement analyses, which are mainly carried out at the later stages of crop growth. The biomass index can be used to adjust the application rate at early growth stages, allowing site-specific application of growth regulators and, in some cases, fungicides. At later stages, the biomass index can also be combined with the N-index to act as a "watchdog index", making it possible to respond to specific conditions such as drought damage.

Simple documentation.

In the mapping mode, the entire field is scanned during the pass and all the measured values are automatically saved. The system does not calculate a target value; instead, it provides fast and simple documentation of the N index and biomass index.



Free calibration.



Easy to calibrate.

For daily use, the user has a number of options available. Free calibration offers a choice between the single-point and the two-point method.

In the single-point method a required N level for a specific measurement at a specific site is pre-defined. The adjustable control intensity, which can be changed at any time during operation, allows the control system to be adjusted in line with the farm manager's preferences and the site. Single-point calibration is particularly suitable for spreading a specified average quantity across the field. The single-point mode is also ideal for growth regulator application.

In the two-point method the measurements from two different sites in the field are entered with the required N level at each site. The control curve for the application rate is derived from these two values. The free calibration options supplied as part of the standard specification enable application of liquid and solid media, irrespective of crop, with no need to purchase additional modules.

In AUTO mode the CROP SENSOR carries out all the calibration processes for the driver. The automatic calibration system automatically calculates the average for the crop and the optimum adjustment range for all crop types and all treatments. This avoids setting and calibration errors – the driver just has to define the average application rate and an adjustment range. AUTO mode simplifies use of the CROP SENSOR considerably.



ISARIA – the expert fertiliser system.

The ISARIA fertiliser system provides an alternative to free calibration. This outstanding system carries out application rate measurements automatically – and is therefore extremely simple to use.

In the ISARIA fertiliser system, sensor-specific N application takes place without further calibration. N uptake by the plants is measured by the sensor heads and compared with the ISARIA fertiliser curve. This shows how much N is missing and the amount of N needed to achieve the target yield is applied to the crop automatically.

Just a few inputs – the growth stage and expected yield – are needed to create a suitable control curve before you can start work. The ISARIA fertiliser system is currently available for winter wheat as an optional module. The algorithms for the ISARIA fertiliser system are the result of more than 20 years of research at the Technical University of Munich.

In addition to the inorganic fertilisers and sprays supported to date, the CROP SENSOR now also works with organic fertiliser. The target application rate is calculated in the volume unit.

Map overlay.

Variable-rate application.

Cost optimisation is an important factor in times of growing concern for the environment and rising production costs. The principle to be applied is: as much as necessary, as little as possible. The optimum application rate largely depends on the expected yield, which may fluctuate greatly according to the site within the field.

The map overlay process.

Using the map overlay system, the field is divided into zones with different yield potential. The 100% zone represents the target yield entered by the user. In zones with a different yield potential, the system automatically increases or reduces this target yield as required. This guarantees that the fertiliser saved in zones with lower values is added to higher-value zones in the field. This is the only way of achieving yield-oriented fertiliser application with an optimum fertiliser balance.

A number of data sets (see illustrations) can be used as a basis for creating a map overlay and then combined. This approach produces the optimum result and is only possible in conjunction with the ISARIA fertiliser system. CLAAS also offers the creation of individual map overlays based on different data as a specialist service.



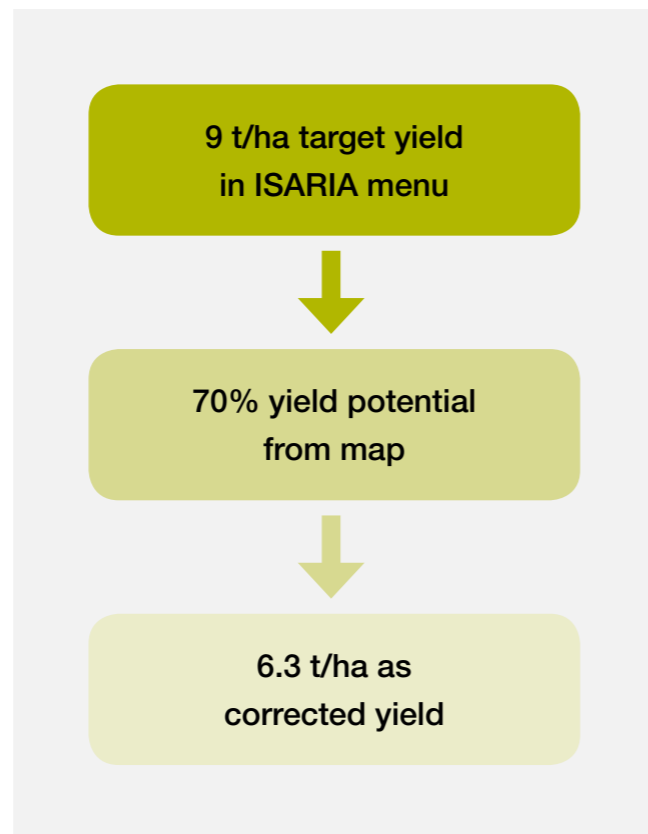
Aerial photograph



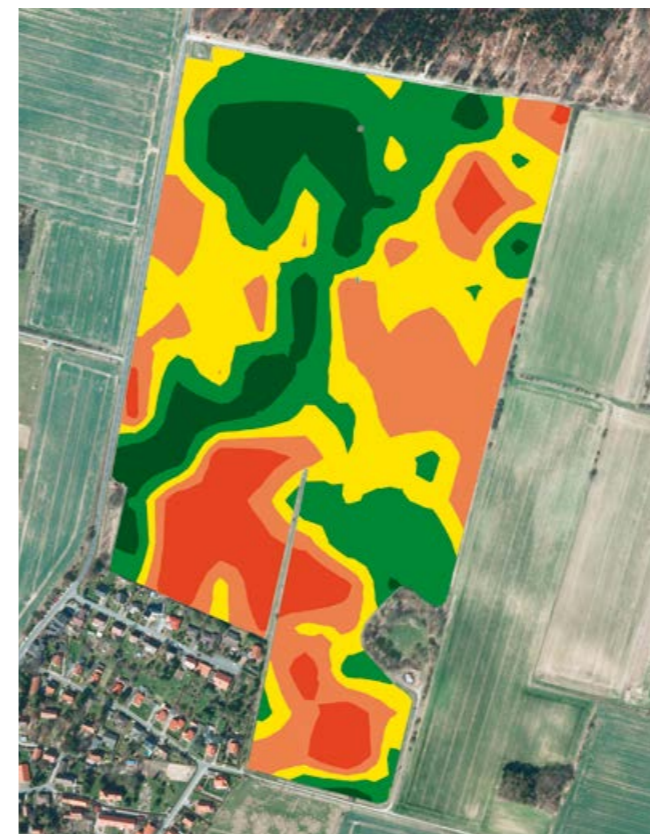
Soil assessment



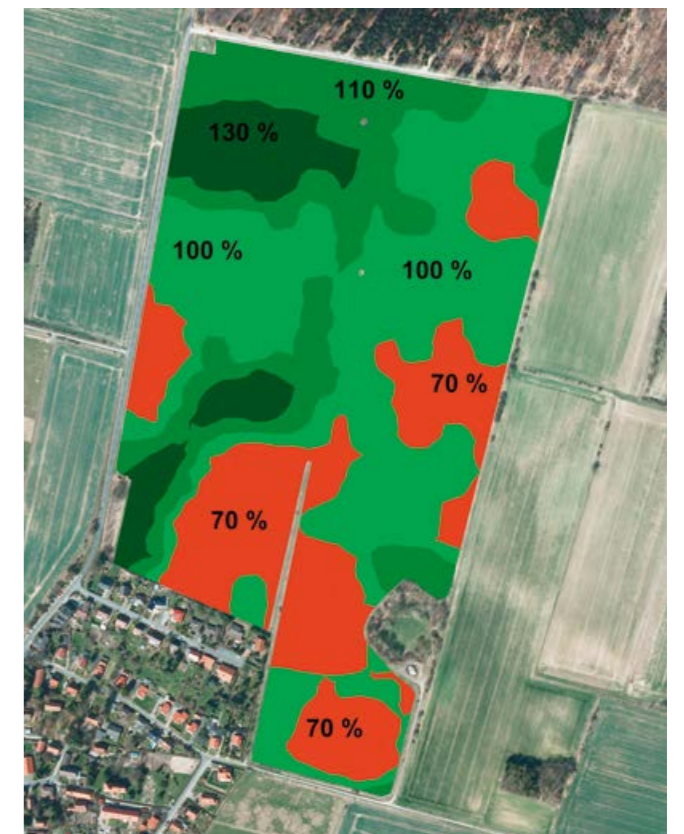
EM 38 – soil mapping



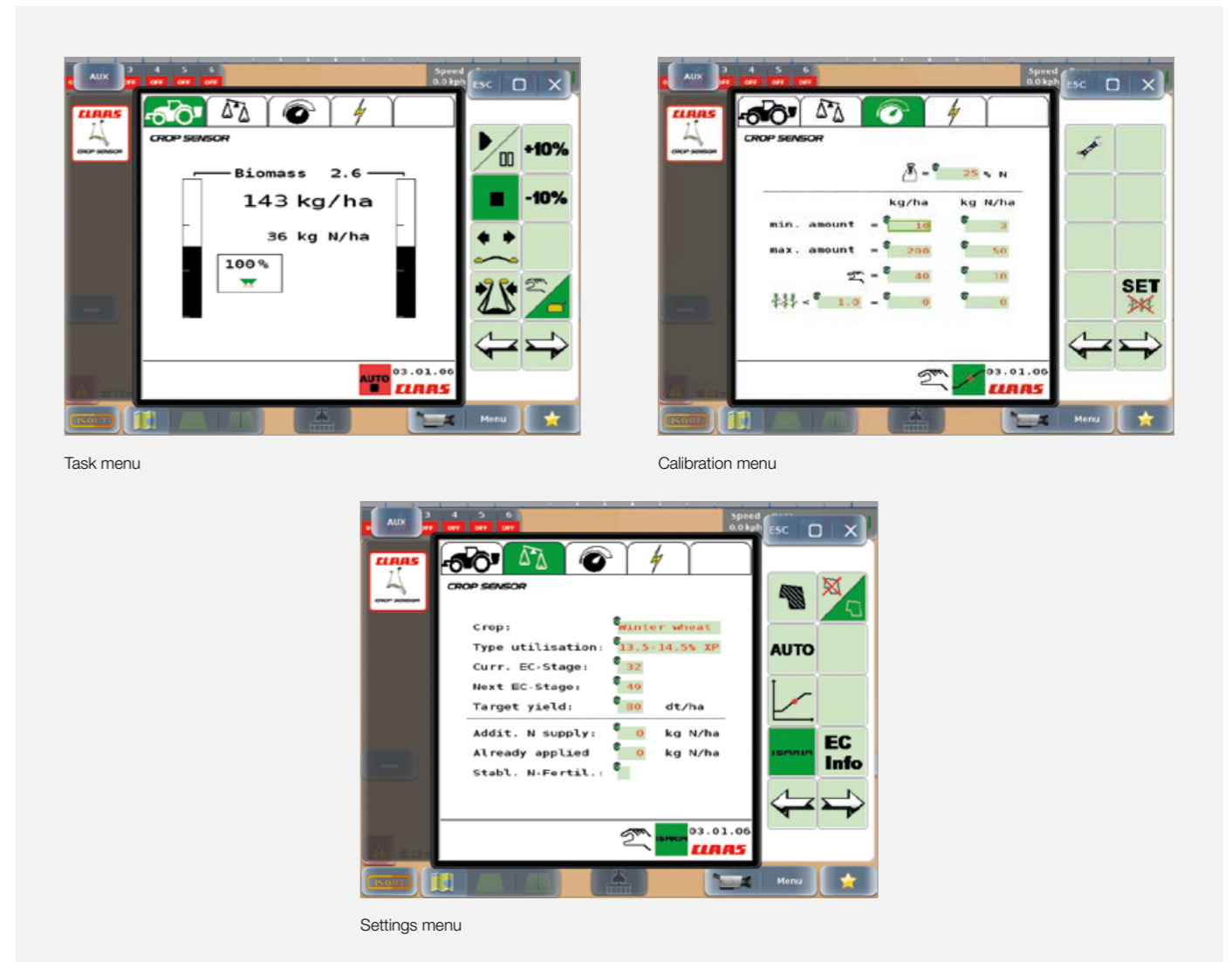
Example of a map overlay calculation



Yield map 2011



Map overlay



ISOBUS included.

With a whole range of major ISOBUS terminals it is now possible to operate a sensor and an implement from a single terminal while at the same time producing accurate documentation.

Ask your EASY contact for a list of the terminals that are currently available and the implements that have been tested for compatibility.

But older implements can also be operated with the CEBIS MOBILE terminal via a serial interface, provided that they have an electronic control system. The list of these implements is growing all the time. You can get the latest information from your EASY contact.



ISOBUS connection

Easy to use.

Ease of operation was a priority throughout development of the CROP SENSOR. A crop sensor is only used for a few months of the year and must therefore be intuitive to use and logical.

There are only three menus – the task menu, the calibration menu and a menu for entering settings – making operation child's play for every user.

A big advantage of the CROP SENSOR: no follow-up costs and no additional licence costs during operation.

Good map, good fertiliser application. Benefits of the CROP SENSOR.

The CROP SENSOR is a tool which optimises application of N fertilisers, growth regulators and crop protection products in a variety of crops. Optimisation of the nitrogen supply has a significant impact on yield and quality. And you only apply the amount that the plant can absorb, which saves resources.



Fertiliser savings



Prevents lodging



Optimum distribution



Utilise the yield potential



Good nitrogen balance



Higher N utilisation



Increase yields



Improve grain quality

CLAAS continually develops its products to meet customer requirements. This means that all products are subject to change without notice. All descriptions and specifications in this brochure should be considered approximate and may include optional equipment that is not part of the standard specifications. This brochure is designed for worldwide use. Please refer to your nearest CLAAS dealer and their price list for local specification details. Some protective panels may have been removed to present the function more clearly in photographs. To avoid any risks, you should never remove these protective panels yourself. In this context, please refer to the relevant instructions in the operator's manual.



Ensuring a better **harvest.**

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