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SMART Agriculture

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## GUAÍRA SUGAR MILL SEES INCREASED PRODUCTIVITY WITH SMART AGRICULTURE SOLUTION

Smart Agriculture from Hexagon Solutions is helping ethanol and sugar producers increase crop yield and optimise the performance of workers and machines through improved production logistics and plantation designs based on available land, topography and ideal planting time.

### Background

Brazil is the largest sugarcane producer in the world. Most of its farms are located in the state of São Paulo, where processing plants are producing sugar and ethanol.

Guaíra Sugar Mill is an award-winning mill and electric energy producer. Founded in 1981, Guaíra distillers started out producing 120 000 liters of ethanol a day. Today, 2 700 workers produce 480 000 liters and 1 000 tons of sugar per day to supply the Brazilian, European, African, Middle Eastern, Chinese and Russian markets.

Every part of the cane is used in processing. The wet waste of the distillery is returned to the field to be used as composite fertiliser, while the dry waste fuels an electric power generator. The generator makes the mill self-sufficient in electric energy, and its surplus is sold to the electric energy grid.

### The Challenge

Sugarcane is a perennial, whose mature multiple stems can be harvested for five to six years with good productivity if managed correctly. Without proper irrigation or precision agriculture, harvest productivity can be quite a challenge. A typical cane stalk is approximately three metres high and 70 per cent water, and must be kept viable by irrigation. Maximising harvest potential also requires keeping harvesting machines from running over the plant lines and killing the cane stems. The use of an autopilot in the machines can reduce this loss, but without proper interpretation and handling of the line information, this benefit is limited.

## The Solution

The growing demand for ethanol in a highly competitive market has created a perfect opportunity for the early adoption of precision agriculture.

Smart Agriculture from Hexagon Solutions not only optimises the utilisation of land and water, but fertilisers, pesticides, seeds and other farming resources.

Utilising geo-processing software from Intergraph and steering solutions from Leica Geosystems – two of Hexagon's leading brands – Smart Agriculture keeps farmers abreast of crop management and production through digital workflows created from geo-enabled data. With the information that is collected and analysed, action can be taken to optimise processes and increase efficiencies, thereby improving crop yields and saving costs.

Using Intergraph GeoMedia software, Smart Agriculture helped Guaíra Sugar Mill map land in a geo-referenced database with precise representation of field limits, water resources, roads and infrastructure for electricity and waste management. The topography of the land was optimised to create manageable farming areas.

Initially, planting lines should follow the topography of the terrain to guarantee a proper water supply for the sugarcane. Smart Agriculture helped the mill's designer create multiple line alternatives and select the best set of lines to be sent to the autopilots. Smart Agriculture can estimate the time and fuel needed for each field operation. It provides better precision and reliability for planting, harvesting and pulverisation. By integrating with the automatic pilot, Guaíra Sugar Mill was able to increase the number of lines for crop rows, increasing the amount of sugarcane produced.

"The process for automatically generating crop row lines has improved dramatically," said Alfredo Barbosa Neto, coordinator of geo-technology at Rosário Farm, a branch of Guaíra Sugar Mill. "What used to waste a lot of time for us on each project, now only takes only a few minutes, so the planting team has more time to analyse all the projects and check for accuracy."

## Benefits

- Maximised use of soil by increasing the number of lines per hectare with a rational design
- Faster decision making with ease of access to geographic plantation information
- Stored lines for reuse in future harvesting, fertilising and pest control and increased productivity

## Results

During the 2011/2012 harvest, Guaíra Sugar Mill achieved an average productivity of 82.4 tons/ha on a four-year-old plantation. This is 23 per cent higher than 68.29 tons/ha, the average Brazilian productivity in sugarcane for the same period.\* Much of this success was due to the pioneering use of precision agriculture with Hexagon's Smart Agriculture solution.

"With Smart Agriculture, it's now possible to have a geospatial view of the entire plot area before initialising the work, saving both time and fuel," said Neto. "By using this new technology, we have already projected more than 2 000 hectares of planting area. Imagine the number of additional plants this software will generate for all the farms owned by Guaíra Sugar Mill."

\*Source: Brazil Ministry of Agriculture

## About Hexagon Solutions

Hexagon Solutions offers the next generation of Smart Solutions based on integrated industrial and geospatial technologies within the Hexagon technology portfolio – from industrial and geospatial sensors and data and document management to process and visualisation software. As a result, the value to our customers goes well beyond what each stand-alone product offers, providing high quality and performance in integrated enterprise offerings.

For more information, visit [hexagon-solutions.com](http://hexagon-solutions.com).

Hexagon Solutions is part of Hexagon (Nordic exchange: HEXA B; [hexagon.com](http://hexagon.com)), a leading global provider of design, measurement and visualisation technologies that enable customers to design, measure and position objects and process and present data.