



Digital Farming: Potential market and adoption in Brazil



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SUMMARY

Digital Farming (or Agriculture 4.0) is the fourth wave of technological revolution in the fields – as occurred with mechanization, chemicals and fertilizers use and biotechnology – and has a great growth potential in Brazil.

The “new” technologies, that involve precision agriculture, satellite imagery, drones and big data systems, allow yield increase and costs reduction, besides minimizing the impacts on the environment through the optimization of input usage. Furthermore, technologies tend to simplify the field work and save labour, due to the possibility of real-time monitoring, faster problem solving, planning, among other advantages.

In Brazil, Céleres estimates that Digital Farming market was worth over R\$ 1 billion in 2018, with a compound annual growth rate (CAGR) of 12% until 2025, considering a conservative scenario.

The market potential is huge, as global food production shall increase by 70% until 2050 to feed the larger, more urban and richer population, according to Food and Agriculture Organization of the United Nations – FAO. In this contexts, the investments in farming technology from traditional and non traditional companies increased considerably in the last years, revealing that this sector might be a gold mine.



1940:
Mechanization



1960: Use of
pesticides and
fertilizers



2000:
Biotechnology



2010: Digital
Farming or
Agriculture 4.0

The billionaire Digital Farming market

With large farmlands – which difficult the field monitoring – and as one of the biggest food producers in the world, Brazil has potential to become also one of the largest markets of Digital Farming. Céleres estimates that this market was worth more than R\$ 1 billion in 2018 and shall increase 12% annually, in average, until 2025, in a conservative scenario. The market size includes auto steering, light bars, drones, sensors – soil, plant, irrigation, harvest –, monitoring software, platforms for data analysis, among other items.

Céleres estimates that Digital Farming market in Brazil surpassed R\$ 1 billion in 2018 and shall increase 12% per year, in average, until 2025.

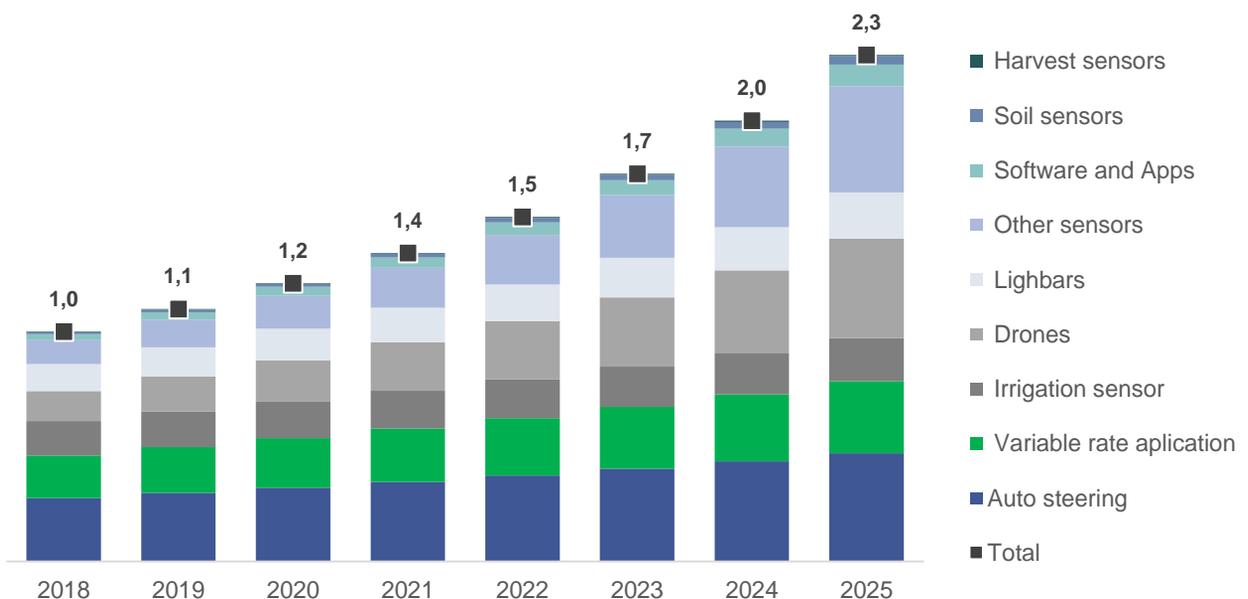
Global market was estimated between R\$ 16 and R\$ 18 billions.

The global market size was estimated between R\$ 16 and R\$ 18,3 billions (equivalent in Brazilian Real) in 2018, according to calculations of consulting companies Roland Berger (3,7 billions euros) and Markets and Markets (US\$ 5 billions), that forecast compound annual growth rates (CAGR) of 12% and 13,4%, respectively.

Due to the high number of technology companies and start-ups entering the Agribusiness sector, Digital Farming seems to be a gold mine. According to AgFunder, in 2018 the global investments in Agtechs totalized US\$ 6,9 billions (considering only the sectors of biotechnology, monitoring, robotic, bioenergy, among others) – an increase of 44% compared to 2017 and 106% over 2016.

Brazil leded the investments in Latin America, with US\$ 69,6 millions in 2018 (until October), according to the data from Pitchbook. Despite the growth at slow pace, given the vast Brazilian potential, there are “consistent signals of growth due to the strong appetite for technological integration”, according to the report.

Brazilian Digital Farming market, in R\$



Source: Céleres.

The maturity of Brazilian market

The adoption of Digital Farming occur mostly in larger crops in Brazil: soybean, corn and cotton.

Céleres calculates that 33% of agricultural area in Brazil already adopt auto steering, lightbars and variable rate technologies.

The Digital Farming adoption in Brazil occur mainly in larger crops, especially soybean, corn and cotton, given the technological level of farmers and relevance of planted area. Technologies related to Precision Agriculture (auto steering, lightbars and hereupon variable tax application devices) were firstly developed and adopted by growers and, for this reason, represent the biggest market share.

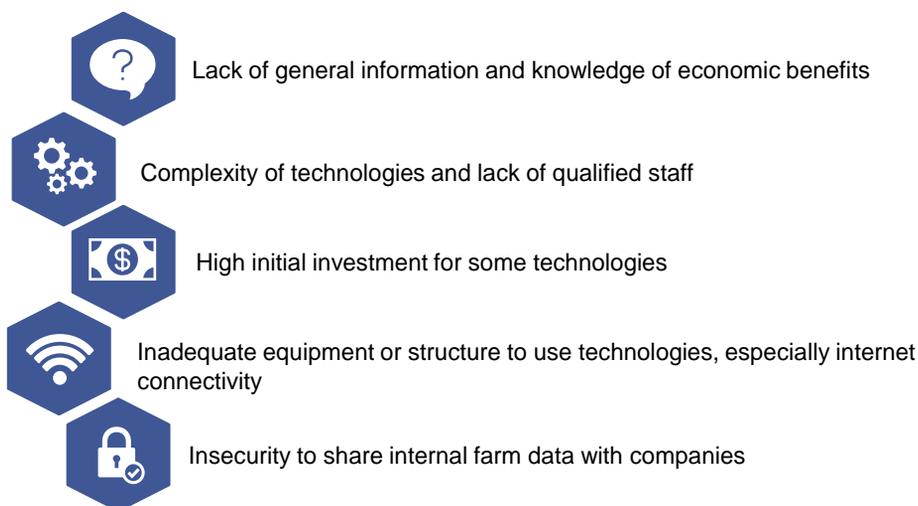
These devices were the precursors of field data collection (soil mapping) and accurate yield analysis. Consequently, this made agricultural production more effective, as it allows optimization of fuel, labour and reduce soil compaction.

Céleres calculates that Precision Farming technologies are already adopted in 33% of agricultural area in Brazil (auto steering, light bar, sensor or variable rate application). In Mato Grosso - biggest grain producing state with higher technological level compared to the national average -, 61% of agricultural machinery had auto steering in 2015, according to Imea (Instituto Matogrossense de Economia Aplicada). Additionally, 47% of machine had lightbars, 58% had section control for sprayers and 37% had section control for planters.

The technology employed in Mato Grosso is in the same level of developed countries such as United States (use of autosteering in 60% of area) and Germany (58% of growers in 2016), for instance.

The fine-tuning of precision technologies applied in the fields and the growing demand for complex and real-time data boosted the rise of other sort of sensors, software, drones, among other tools. However, for these technologies, that characterize Digital Farming, the adoption rhythm is much slower.

Main adoption barriers pointed in studies from several countries:



An inadequate infrastructure, specially internet, limits the transmission and storage of collected data by Digital Farming tools – and this is not a constraint only in developing countries. A report from European Commission showed that the internet coverage in rural areas in Europe was of 40% in 2017 – in Germany, the percentage is of 54% of rural properties.

The restriction is beyond the connectivity in the fields, encompassing the inclination to use internet and equipment for business. In United States, 73% of farmlands have computers, but only 47% use computers for work, according to the United States Department of Agriculture (USDA).

In Brazil, only 40% of farmlands have broadband, according to the Brazilian Institute of Geography and Statistics (IBGE), which becomes a substantial barrier to adopt digital technologies. The internet coverage expansion in rural areas, however, shall reach 80% of farmlands in 2025, estimated Céleres, and tend to boost the digital technologies adoption.

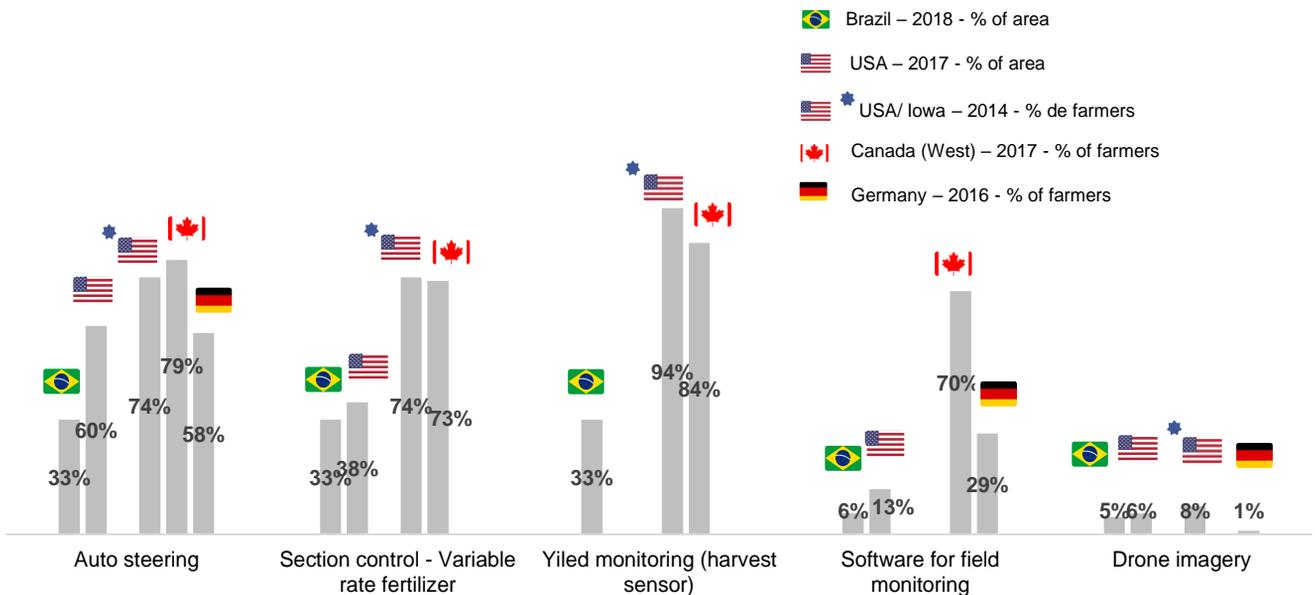
Software and Apps have a high growth potential, but still face a lack of knowledge or the struggle to use, besides the connectivity limitations. Céleres calculates that 6% of total agricultural area was monitored through software in Brazil in 2018. Nevertheless, the use of these technologies is a strong tendency in the country, as well as it occurs in mature markets.

The use of drones, in the other hand, requires a higher investment and ability to operate the equipment likewise to process mapping data. For this reason, the adoption in Brazil as well as in developed countries is still low.

The inadequate infrastructure, such as internet access, is a barrier even in developed countries.

In Brazil, only 40% of farmlands have internet connection. The percentage shall reach 80% in 2025, according to Céleres.

Digital Farming adoption rates



Source: Céleres (2018), Purdue University (2017), Iowa Farm Bureau (2014), PWC (2016), Agriculture and Agri-Food Canada (2017). Elaboration: Céleres.

It is clear that Digital Farming will continue increasing significantly in the next years in Brazil. Once more information are spread, results are seen, devices become easier to use and cheaper, adoption shall rise also in other activities, besides bigger crops. There is a high potential of expansion also in livestock production - specially meat production - where the adoption is nowadays much lower than in agriculture.

The market maturity seems to be in the beginning, despite some technologies are available for a longer time: precision farming was available for a wider audience in 90's. In face of the hurdles of adoption, present even in developed countries, the sector still must address since structural challenges – as factors linked to the connectivity – until value creation.

The new technological revolution shall impact the whole value chain. As a massive amount of data become available, input and machinery industries are able to adequate themselves to farmers' needs and invest in research. The input distributors have also an important role in this context, once they are closer to farmers and mostly responsible for providing solutions and technical assistance to farmers.

In addition, as an extensive amount of new players are entering or shaping a new agribusiness ecosystem – such as startups, technology companies - traditional players will need do adapt to this modification (or perhaps disruption).





About Céleres®

Founded in 2002, Céleres is a consulting company focused on the agribusiness sector that despite being one of the most expressive of the Brazilian economy, has great shortages in products and services capable to meet the specific needs of agribusiness.

Using Business Intelligence support, the company offers to its clients differentiated solutions, obtaining diagnostics, design strategies and planning ahead.

With a highly qualified and diverse team, Céleres has a holistic view of the agribusiness supply chain, looking forward to predict trends and offer the best information capable of assisting its clients in their decision-making.

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