Unlimited digital contributions for a more precise agriculture

Inria-Brasil workshop on Digital Agriculture

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www.agriculturadeprecisao.org.br

What is Precision Ag?

ISPA | International Society of Precision Agriculture

Precision Ag Definition

“Precision Agriculture is a management strategy that gathers, processes and analyzes temporal, spatial and individual plant and animal data and combines it with other information to support management decisions according to estimated variability for improved resource use efficiency, productivity, quality, profitability and sustainability of agricultural production.”

Revised January 2024

Succinct Version

"Precision Agriculture is a management strategy that takes account of temporal and spatial variability to improve sustainability of agricultural production."

Ag fields are not uniform, which offers opportunities and challenges

Precision Agriculture (PA) is crucial for a more sustainable agriculture

From the Ag Digital, expectations are to deepen and expand PA practices, by:

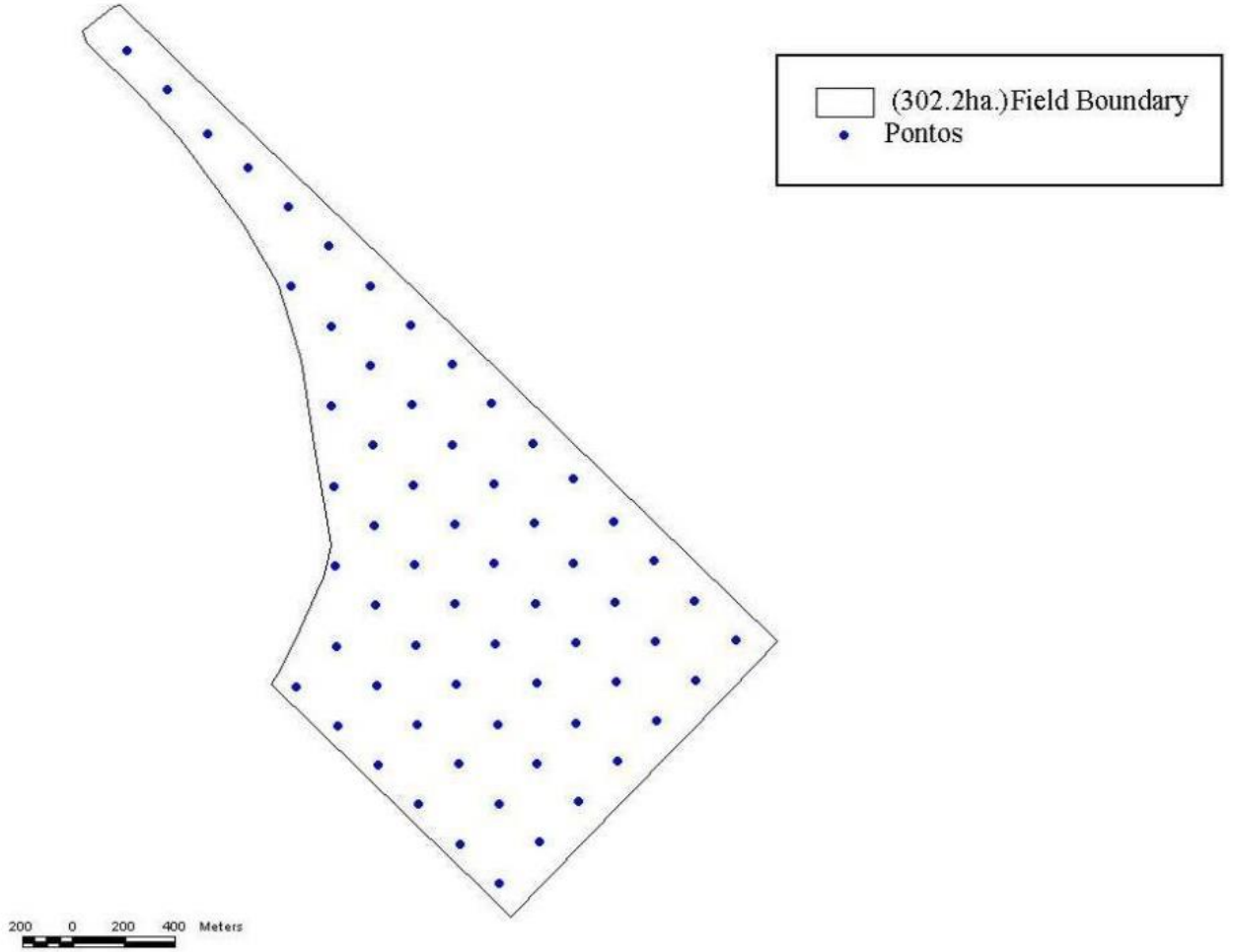
Data acquisition intensification
Advanced analysis solutions
Better diagnostic and more automatic recommendations
Adequate apps and platforms for solutions delivery

In Brazil:

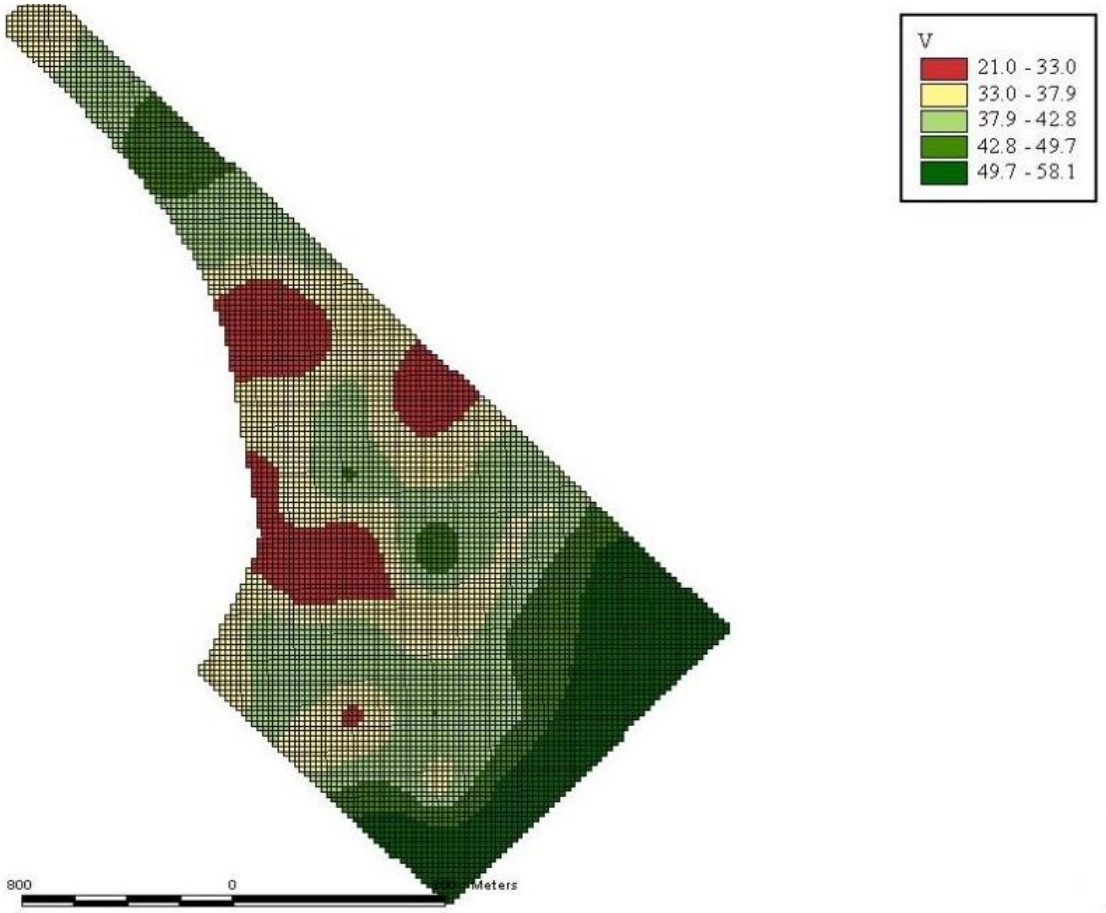
- we have almost 25 years of PA

- a well organized community composed by academics, industry, service providers (consultants) and farmers, with focus on soil fertility management

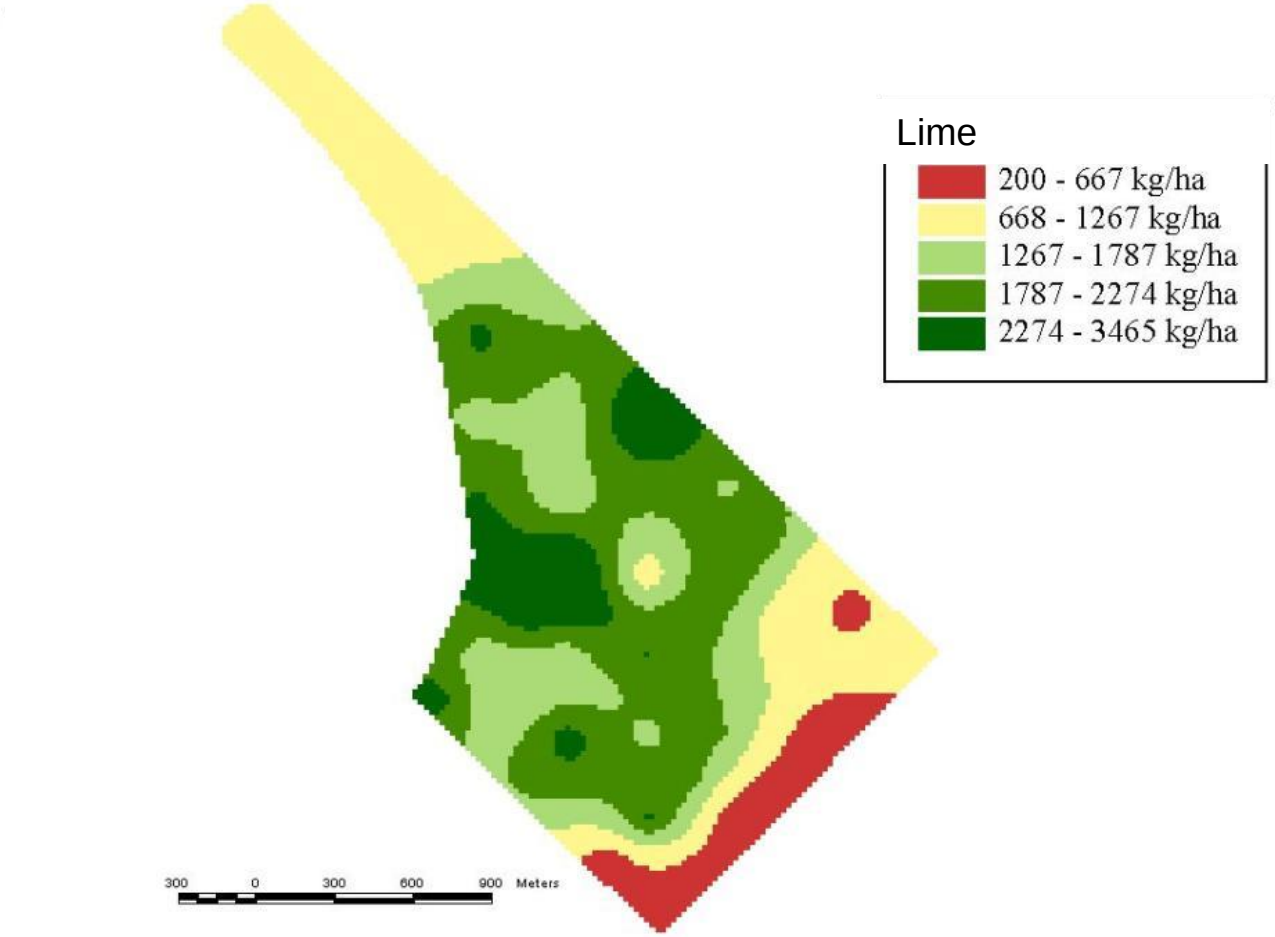
Investigation (soil sampling)



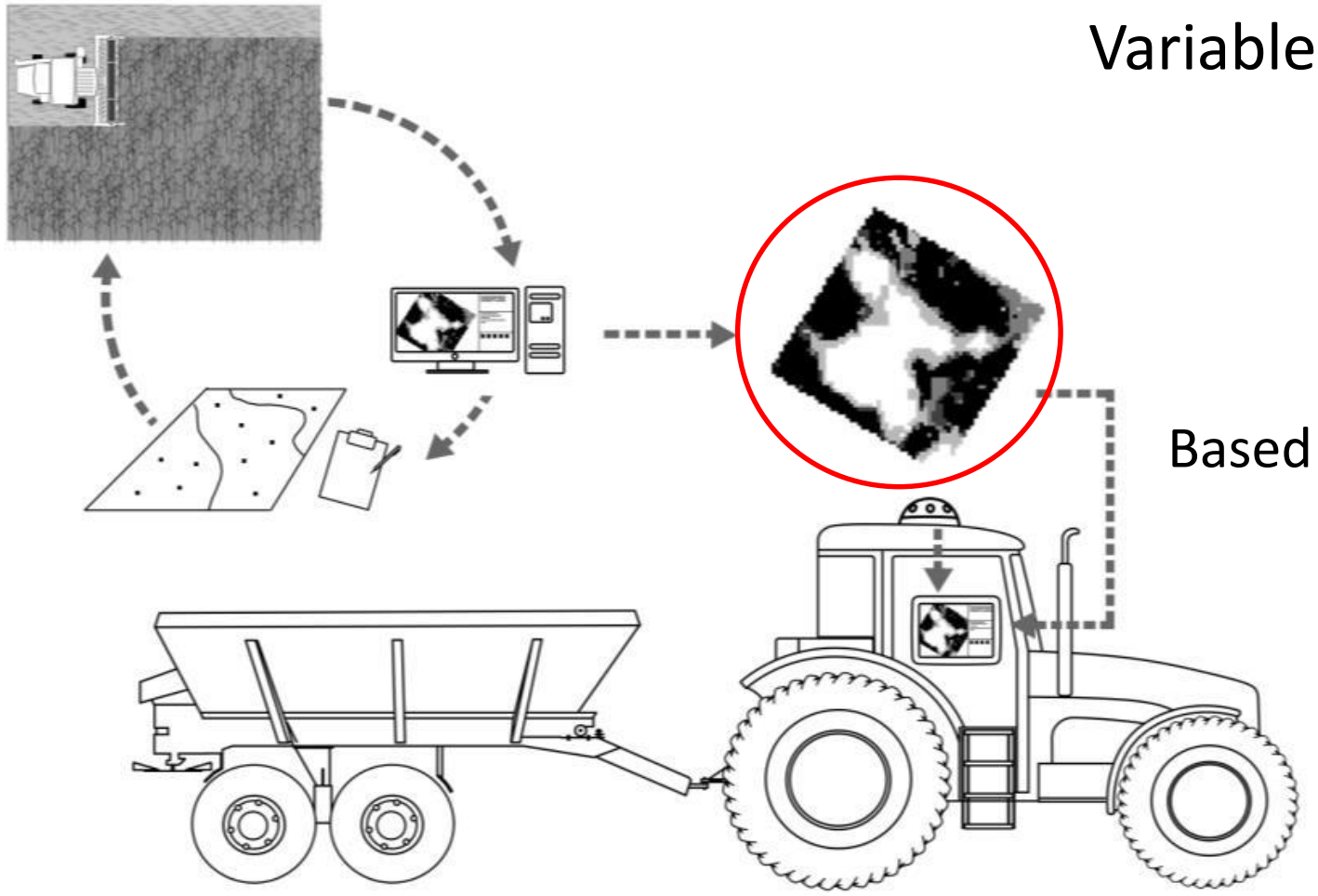
Diagnostic



Recommendation



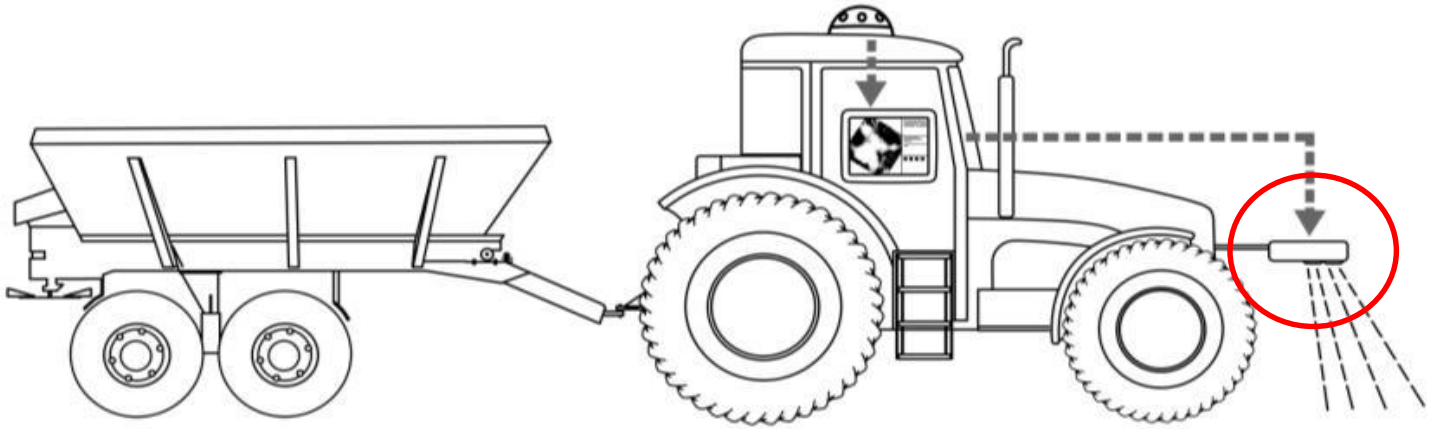
Variable rate inputs



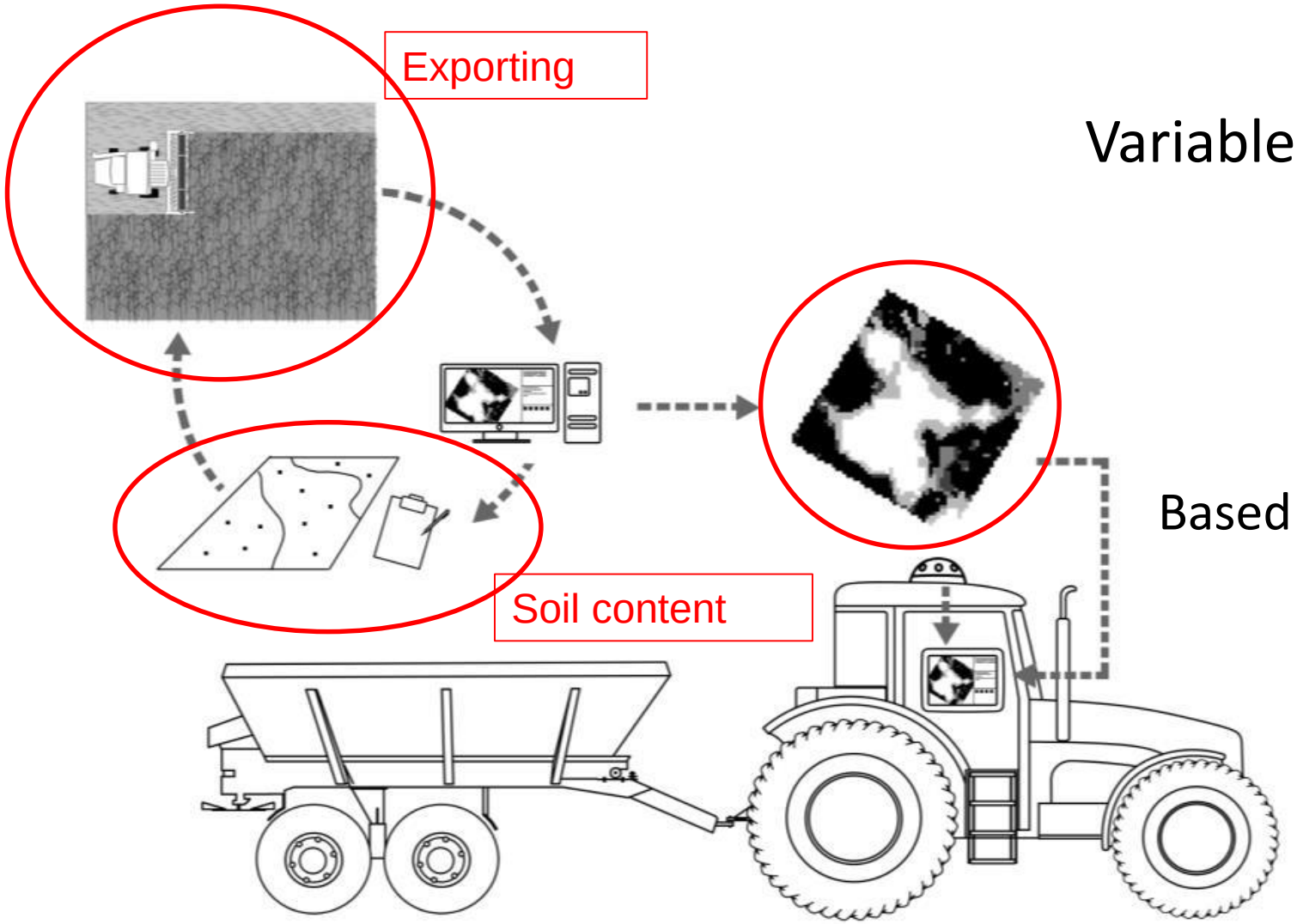
Based on maps

Variable rate inputs

or based on sensors

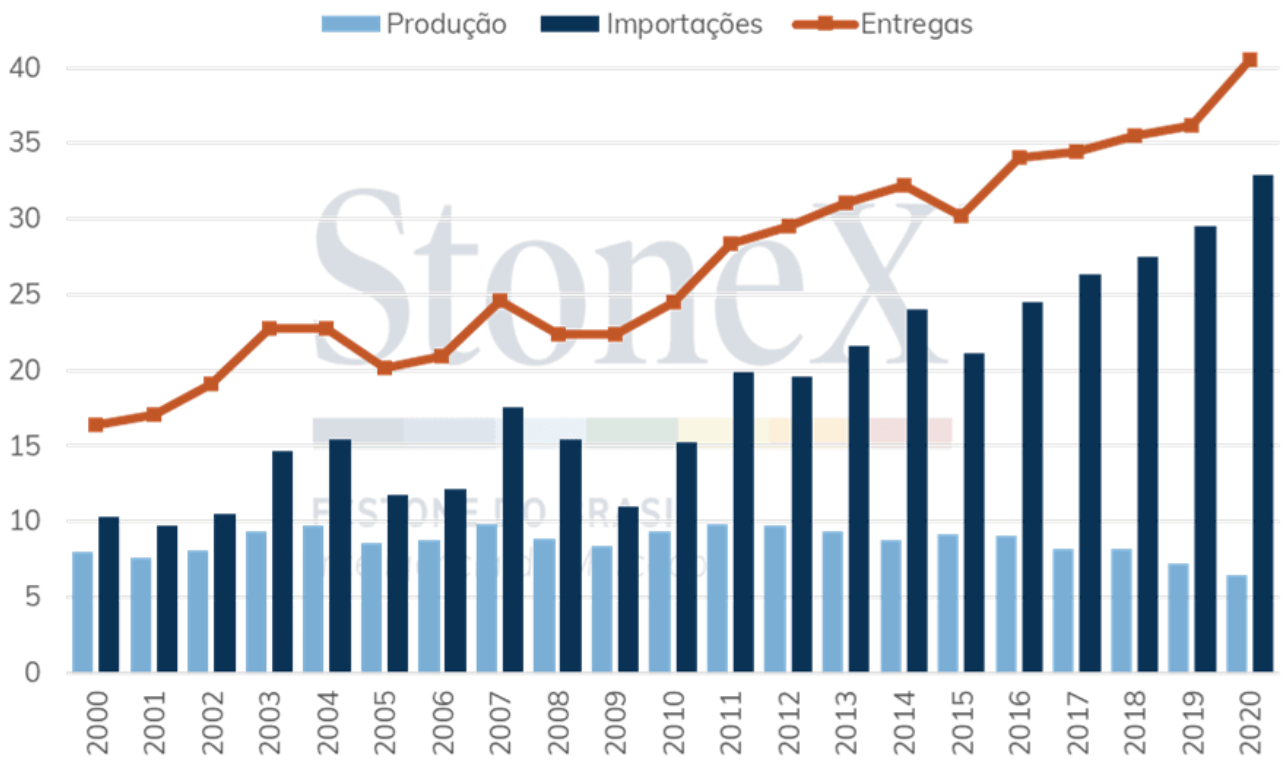


Variable rate inputs



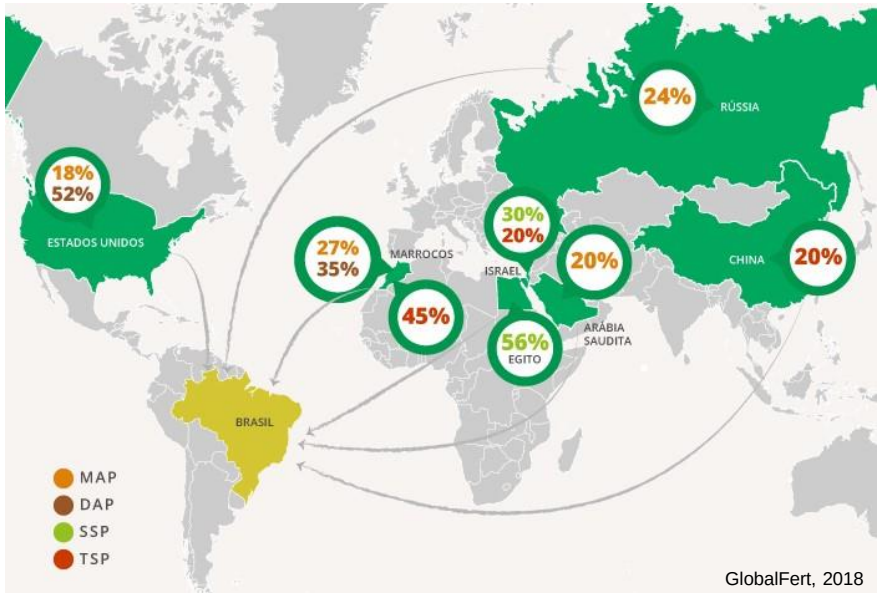
Highly weathered and acidic soils, especially in the tropical area

Fertilizers



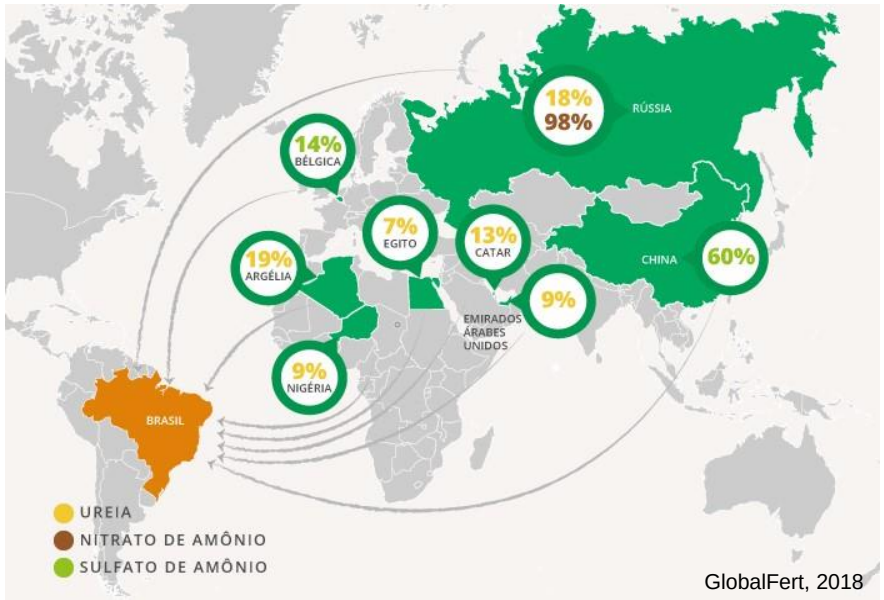
Stonex, 2021

P & K



GlobalFert, 2018

N



GlobalFert, 2018

PA adoption numbers

Basic question: do you use any kind of variable rate application?

Entrevistas por UF	Total
Mato Grosso	255
Bahia	156
São Paulo	144
Goiás	140
Paraná	91
Rio Grande do Sul	81
Maranhão / Piauí / Tocantins	78
Minas Gerais	77
Mato Grosso do Sul	65
Total	**1.087**

IHS Markit

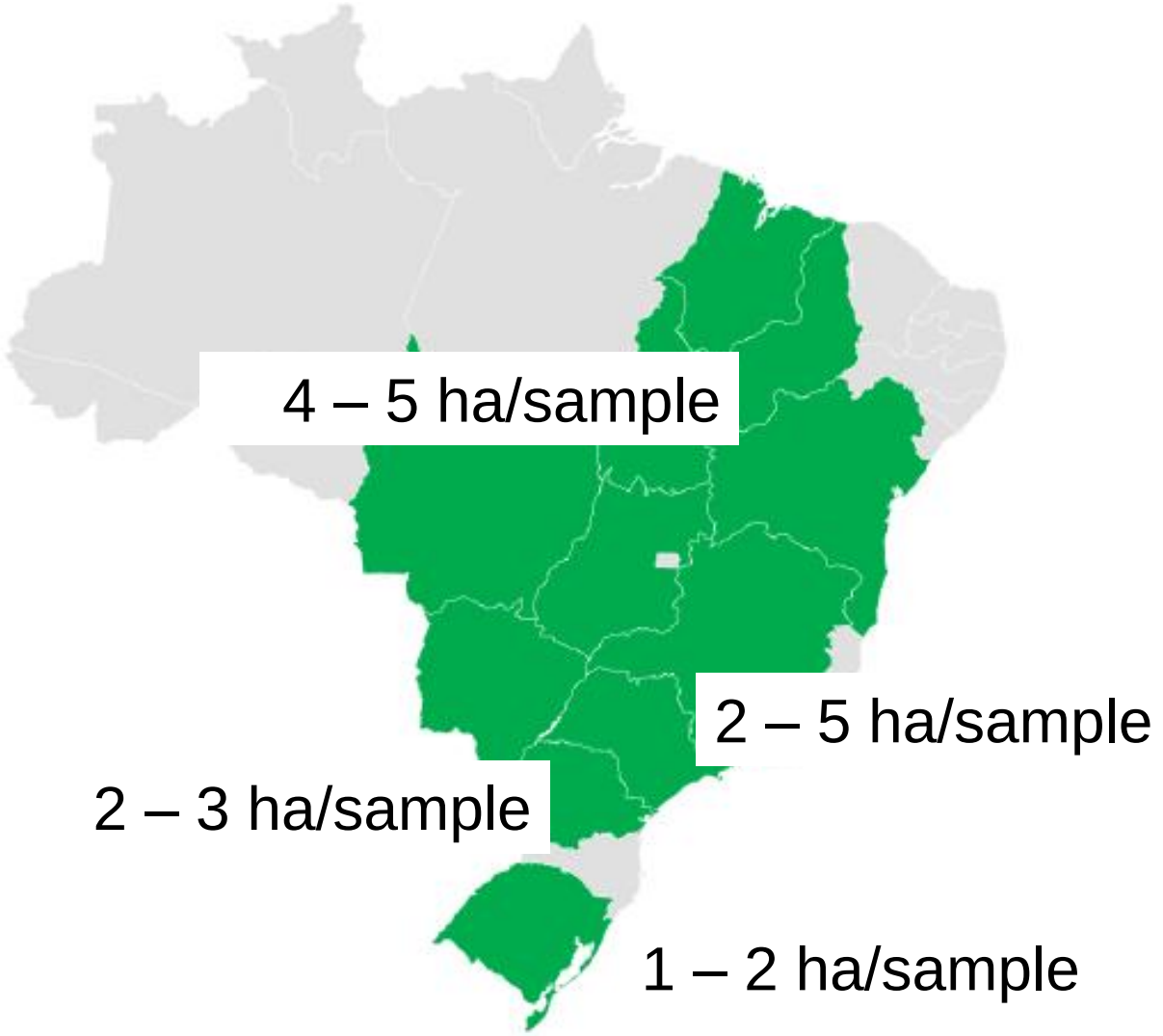
S&P Global

Soybean	34%
Sugarcane	14%
Cotton	66%
All	33%

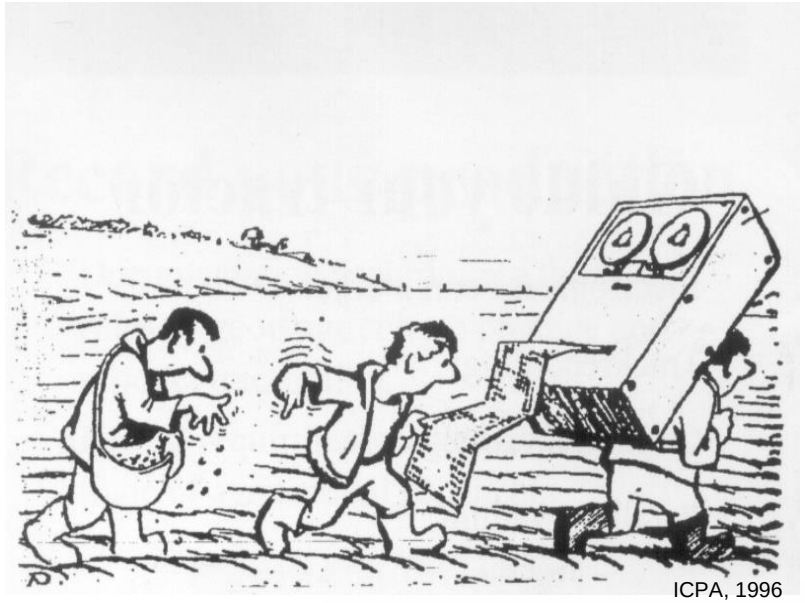
* Recommendations based on grid soil sampling

	Total	Cotton	Sugarcane	Soybean
Lime	**85%**	78%	84%	86%
Gypsum	**38%**	11%	57%	39%
Fertilizer on seeding	**36%**	21%	22%	38%
Top dressing fertilizer	**31%**	12%	15%	33%
Foliar fertilizer	**2%**	0%	2%	2%
Pest monitoring	**7%**	6%	13%	7%
Agrochemical application	**2%**	2%	8%	1%

Grid sampling size



PA & DA



ICPA, 1996

Precision Farming

90‘s

Site specific

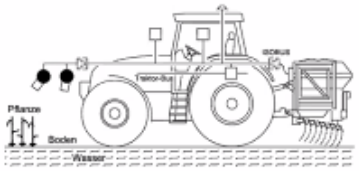
AGS/SC/VRA

Smart Farming

2000s

Decision support

Real-time sensor support



Digital Farming

Now

IoT

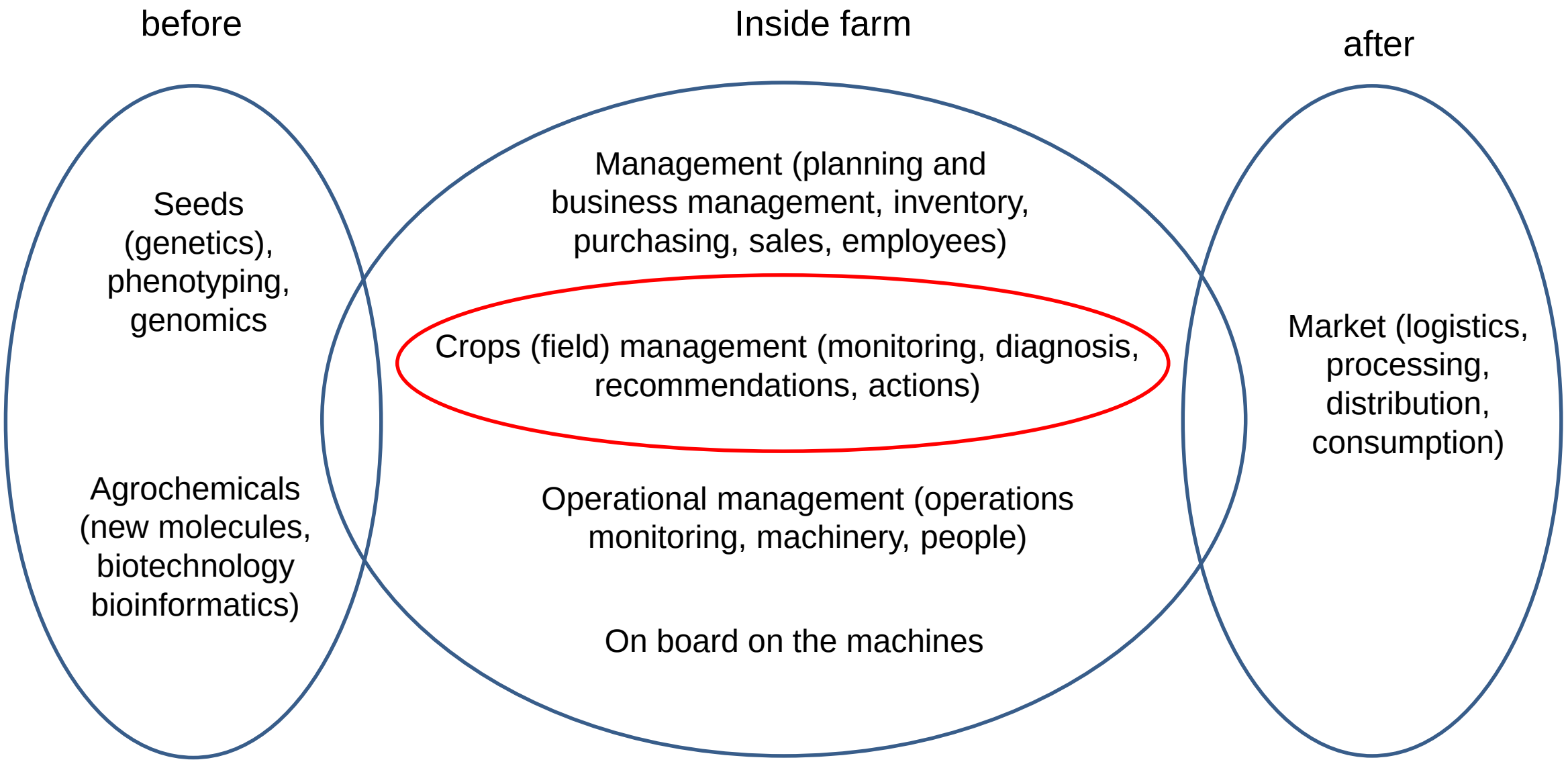
Cloud Computing

Big Data & AI

Robots

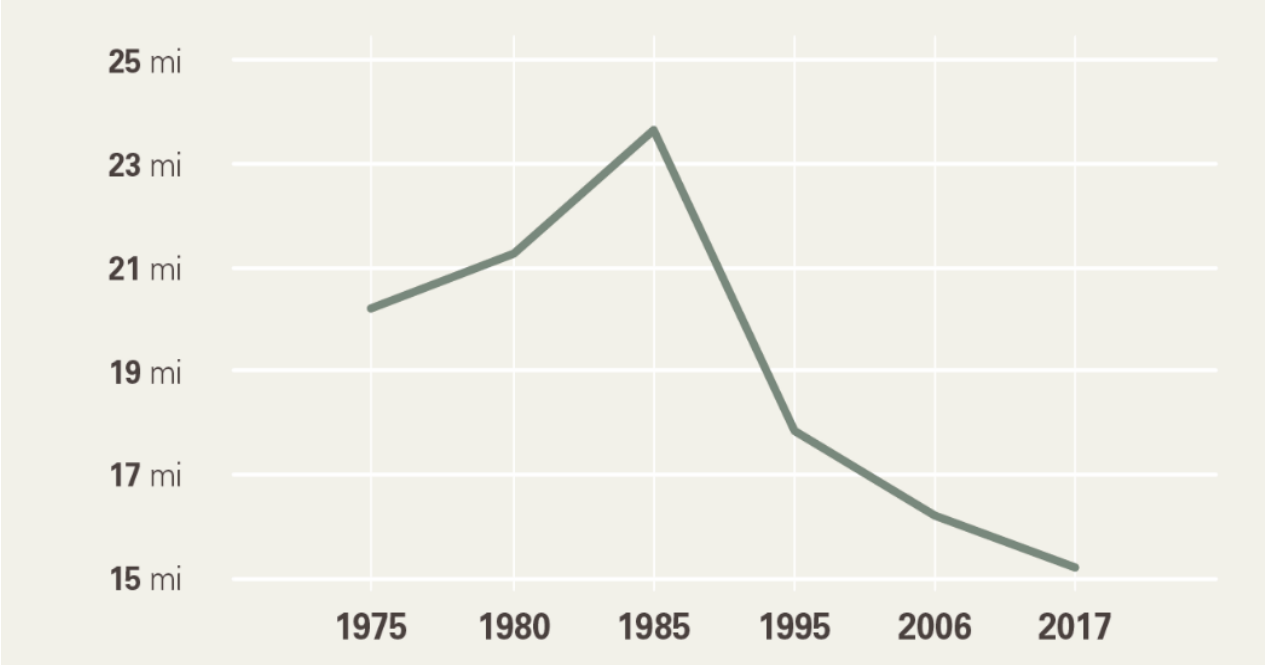
Treiber, M (2022)

Ag Digital Solutions

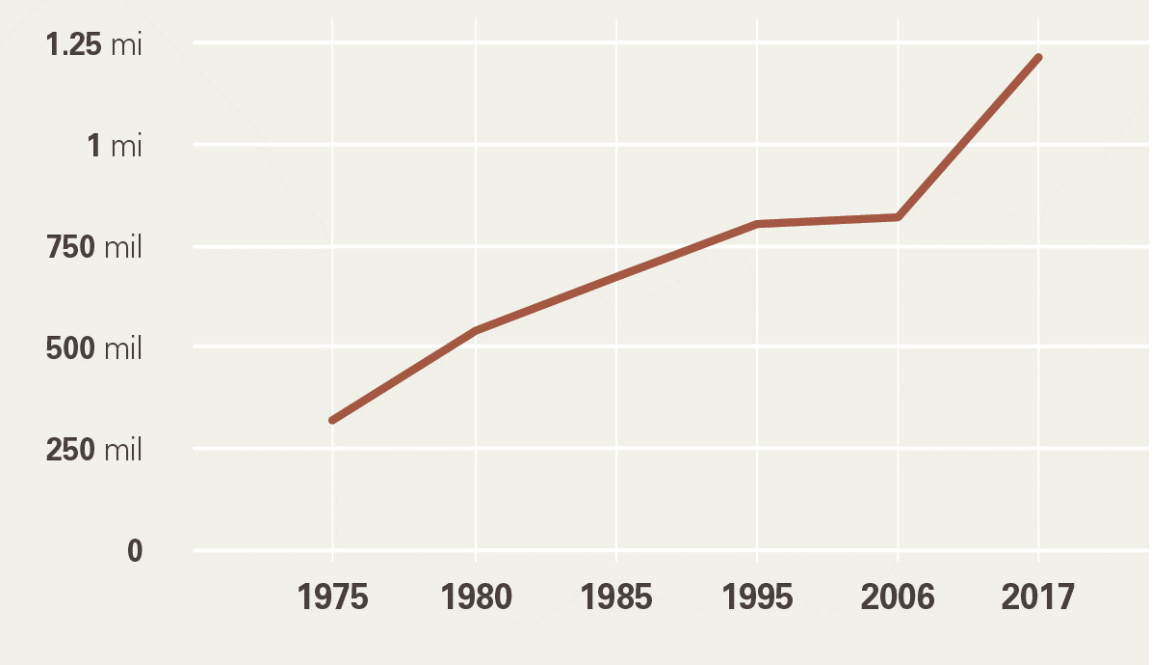


Brazilian Population: 215 mi

People in agriculture

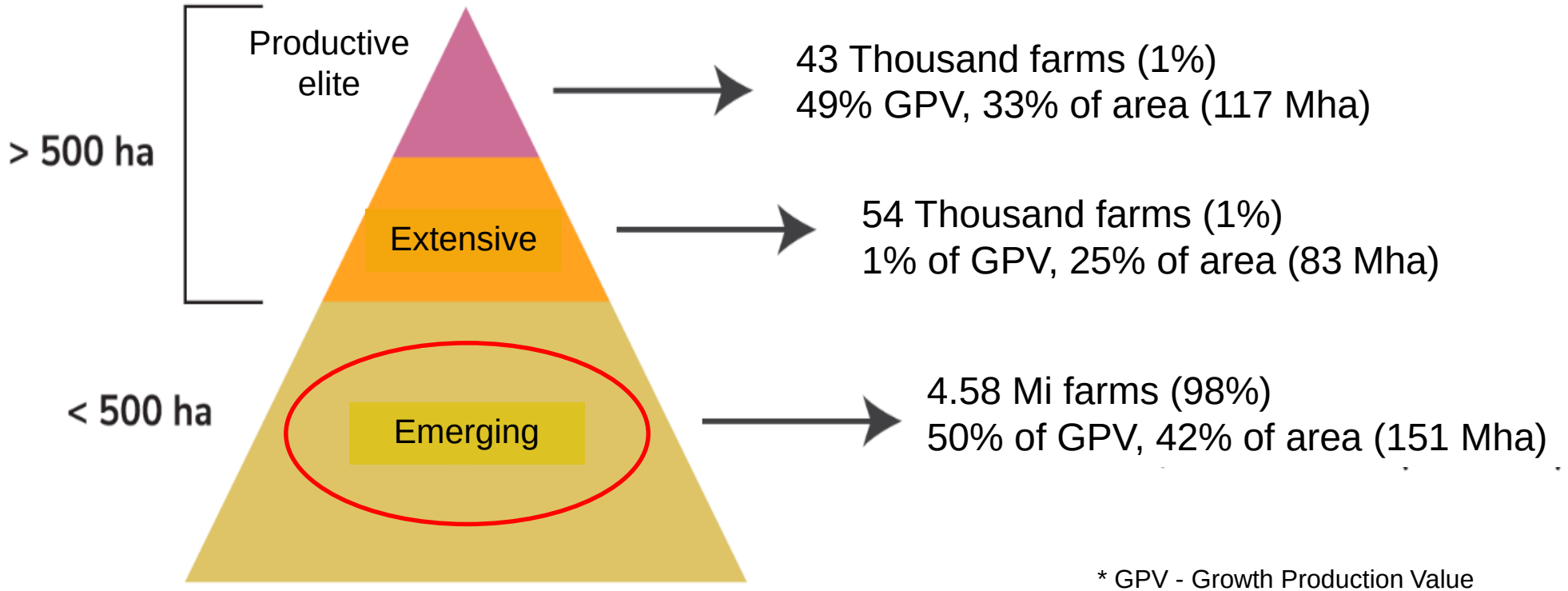


Tractors



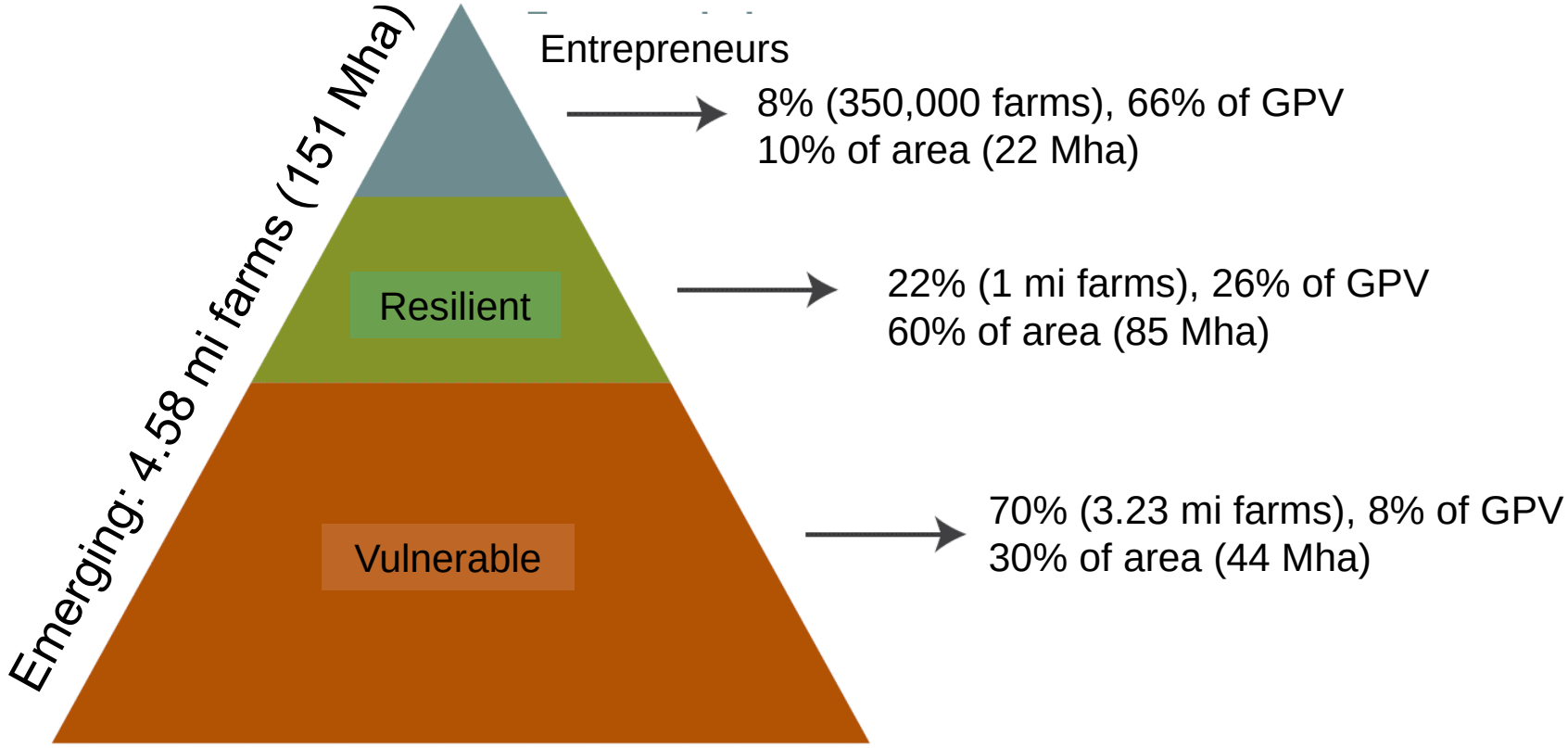
AGÊNCIA IBGE NOTÍCIAS

Challenges and risks

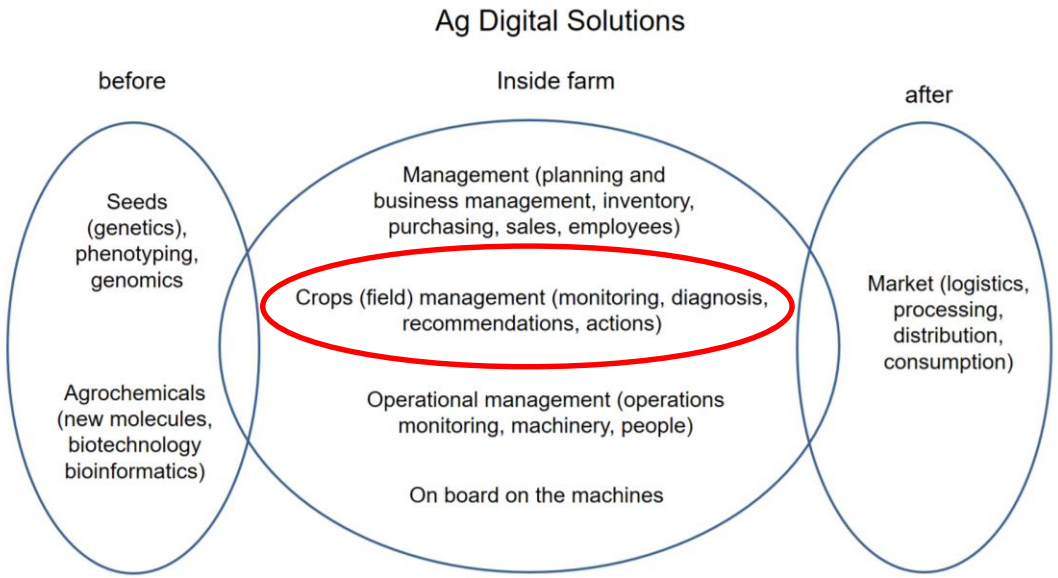


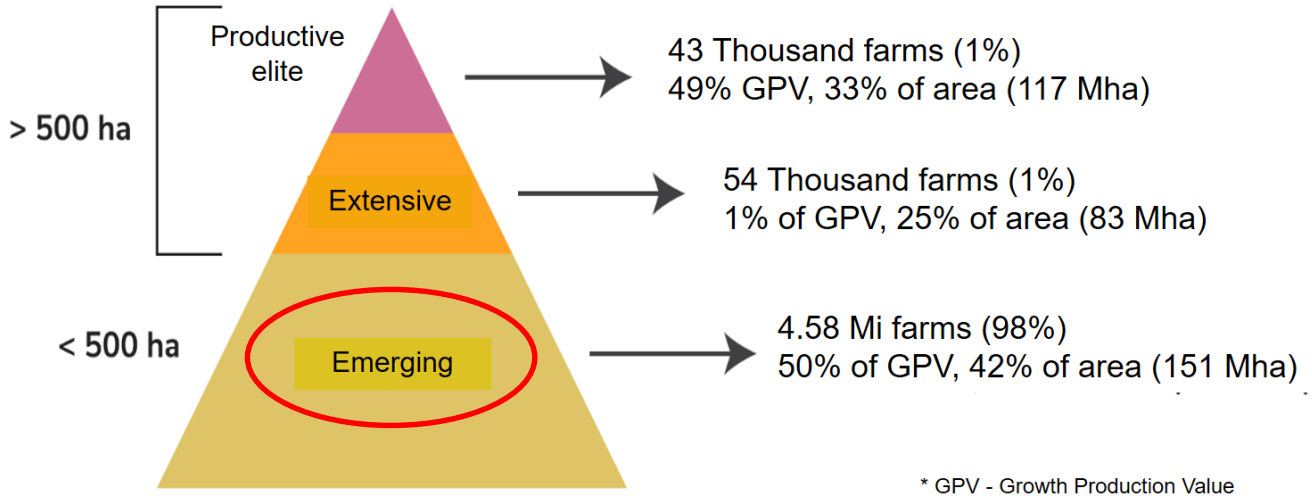
* GPV - Growth Production Value

Brasil. Ministério da Agricultura, Pecuária e Abastecimento. Potencialidades e desafios do agro 4.0 : GT III "Cadeias Produtivas e Desenvolvimento de Fornecedores" Câmara do Agro 4.0 (MAPA/MCTI) / Ministério da Agricultura, Pecuária e Abastecimento. Secretaria de Inovação, Desenvolvimento Sustentável e Irrigação. – Brasília : Mapa/ACES, 2021. 66 p


Emerging: 4.58 mi farms (151 Mha)
Entrepreneurs
8% (350,000 farms), 66% of GPV
10% of area (22 Mha)
Resilient
22% (1 mi farms), 26% of GPV
60% of area (85 Mha)
Vulnerable
70% (3.23 mi farms), 8% of GPV
30% of area (44 Mha)

Priorities





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Thanks!

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