

V Seminário

Desafios da Liderança Brasileira no Mercado Mundial da Soja



19 e 20 de setembro de 2023

# Aplicação da **inteligência artificial** na cadeia produtiva: **perspectivas e desafios**

Domingos Sárvio M. Valente

**UFV**

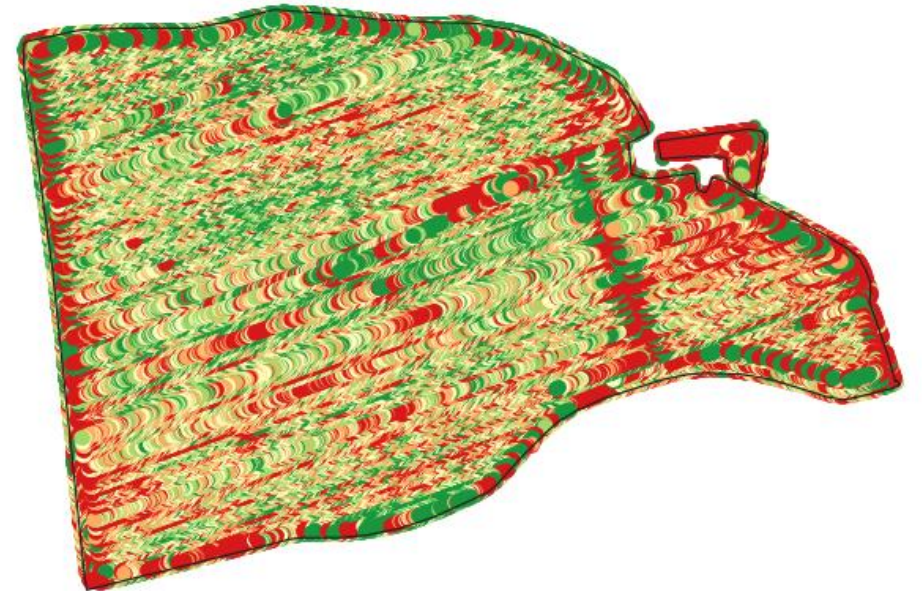
Universidade Federal de Viçosa





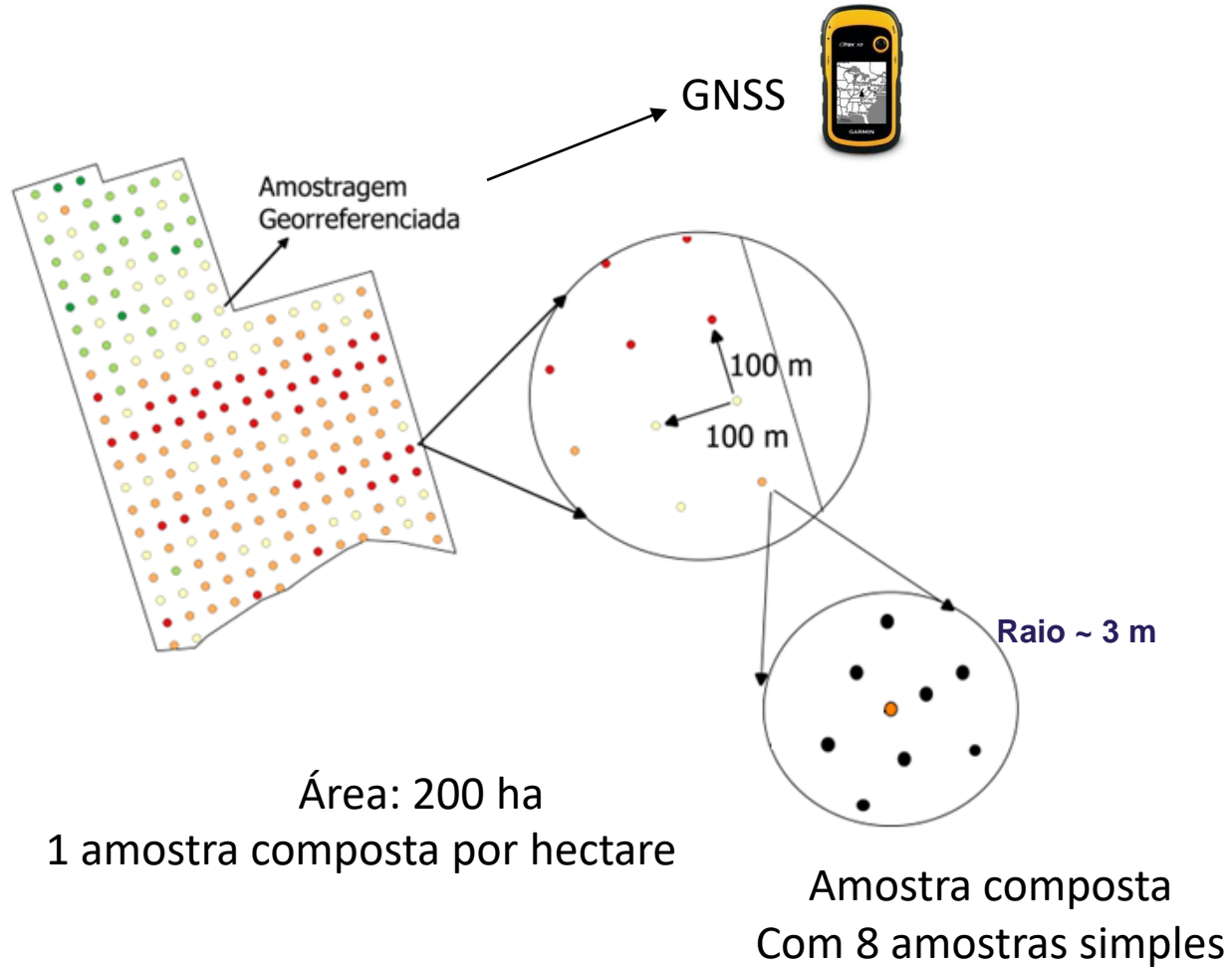
# OBTENÇÃO DOS DADOS

Dados das máquinas



# OBTENÇÃO DOS DADOS

## Amostras de solo





# OBTENÇÃO DOS DADOS

## Sensores de solo (CEa)



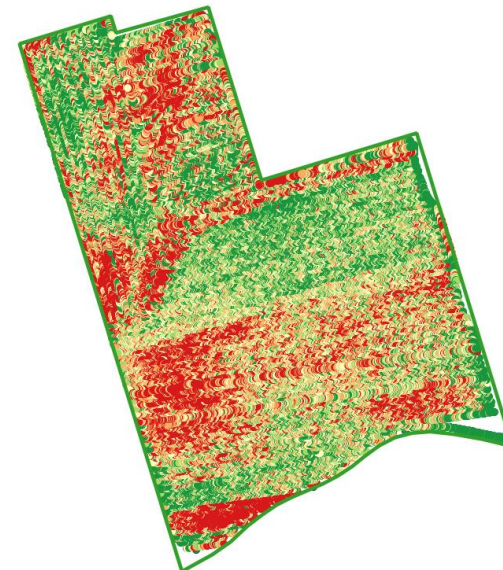
LandMapper ERM 02



GeoCarta



Veris



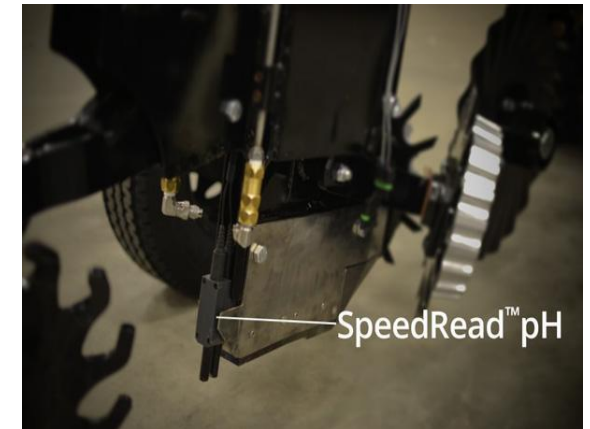


# OBTENÇÃO DOS DADOS

## Sensores de solo (CEa)



CE 60 cm



SpeedRead™ pH

pH



MO



# OBTENÇÃO DOS DADOS

## Sensores de solo: espectrometria




### [Precision Agriculture](#)

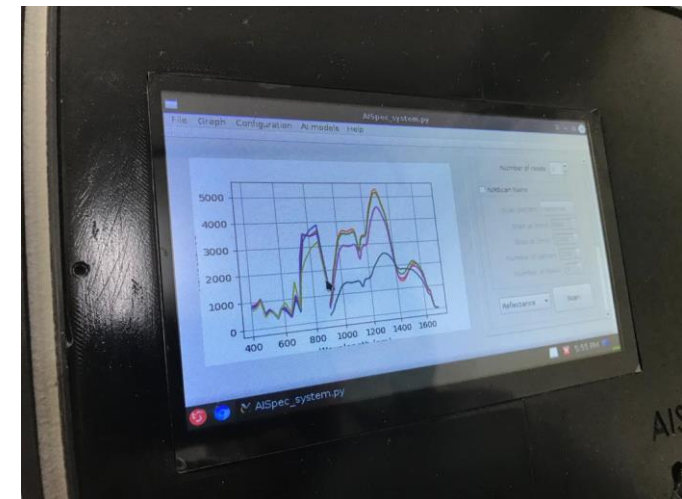
June 2019, Volume 20, [Issue 3](#), pp 541-561 | [Cite as](#)

## Determination of chemical soil properties using diffuse reflectance and ion-exchange resins

[Authors](#)

[Authors and affiliations](#)

G. O. Mayrink, D. S. M. Valente, D. M. Queiroz , F. A. C. Pinto, R. F. Teofilo



Doutorando  
Thiago Furtado

# OBTENÇÃO DOS DADOS

## Sensores: Câmeras



MAPIR  
Red, Green e NIR  
NDVI



MicaSense  
5 Canais individuais :



MicaSense Altum  
6 Canais individuais :  
+ Thermal infrared



Hiperespectral (Cubert)  
450-950nm, 125 bands

# OBTENÇÃO DOS DADOS

## Plataformas: drones e satélites



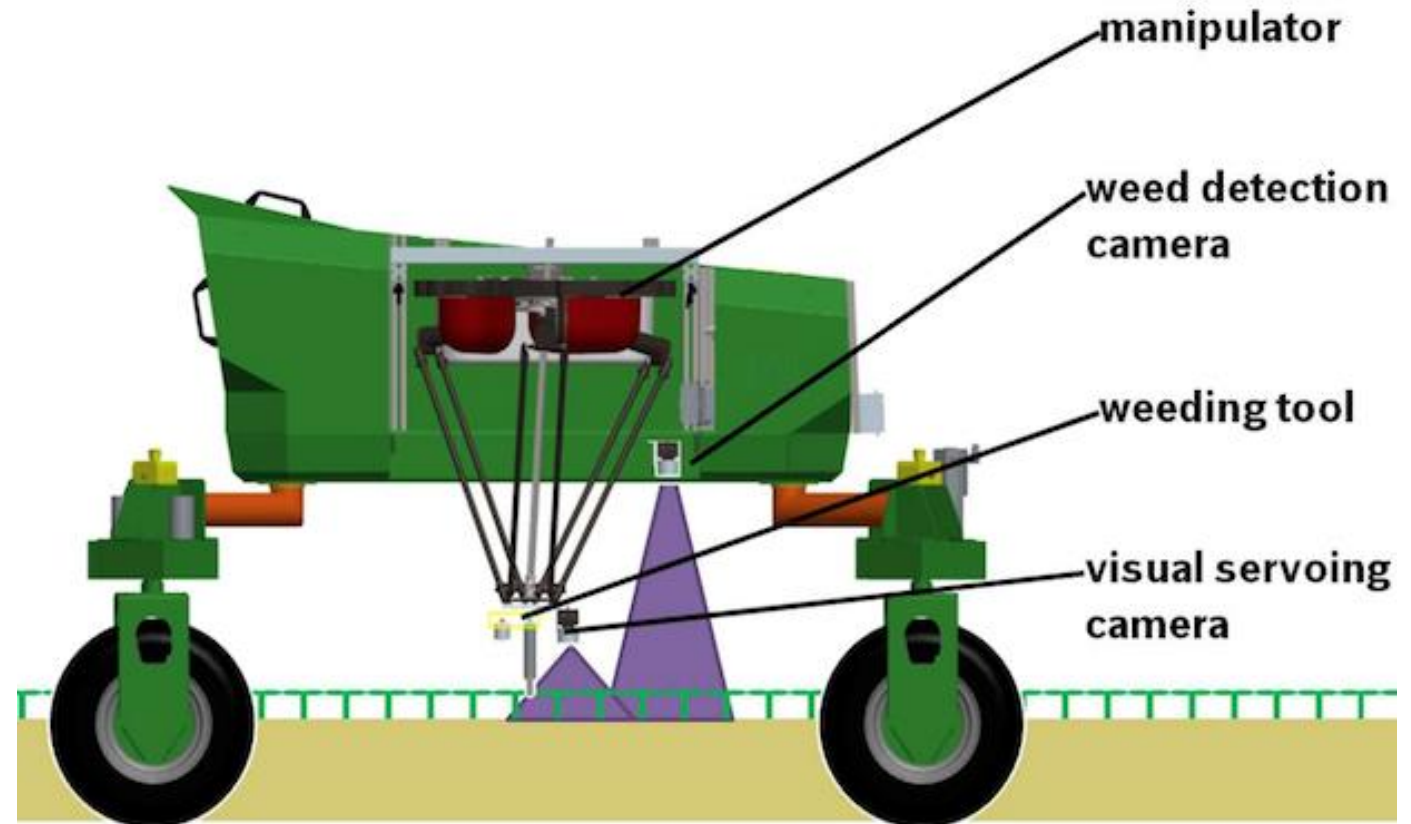
**Sentinel 2**  
**LandSat 8**  
**CBERS 4A**  
**Amazônia 1**





# OBTENÇÃO DOS DADOS

## Plataformas: robôs















# OBTENÇÃO DOS DADOS

Plataformas: robôs



**University of Illinois - EUA**



# OBTENÇÃO DOS DADOS

Plataformas: robôs



**Universidade Federal de Viçosa**

**UFV**

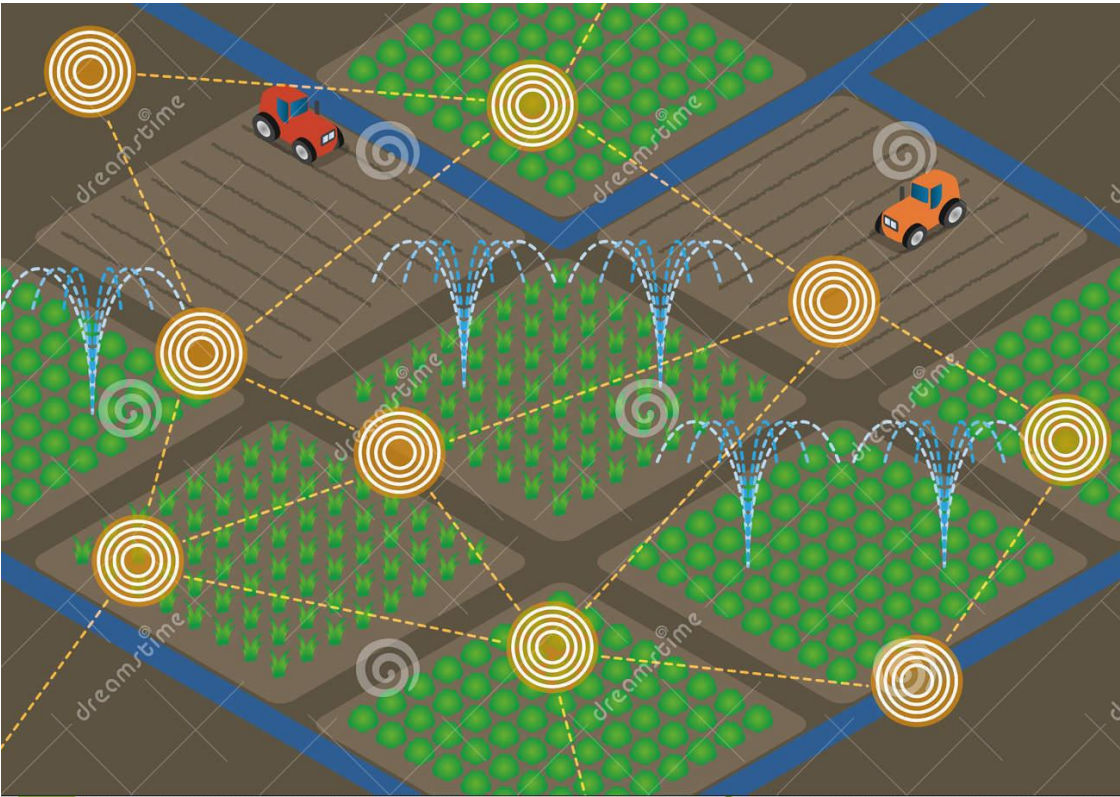
Universidade Federal de Viçosa

  
**FAPEMIG**



# OBTENÇÃO DOS DADOS

# Internet das coisas



Download from  
**Dreamstime.com**  
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Internet dos animais



Internet do solo



Internet das plantas



# OBTENÇÃO DOS DADOS

# Tendências



**BIG DATA**



Cloud Computing



Sensing Technologies



**Desenvolvimento de novos sensores**

**Novas plataformas (Robotização)**

**Aumento da conectividade**

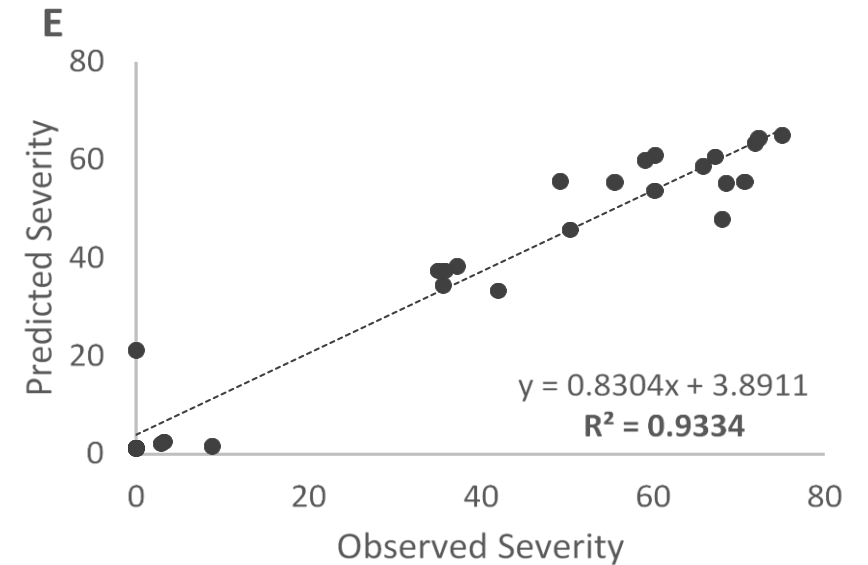
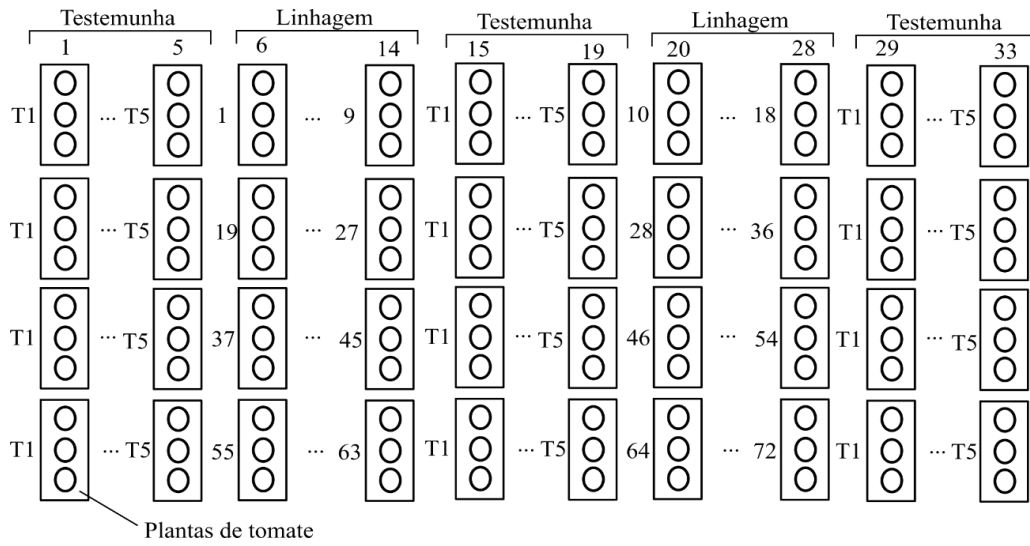
**Armazenamento e processamento em nuvem (BigData)**



**DataScience e Inteligência Artificial**



## Drones em Tomate: Requeima (DEA/DFT-UFV)

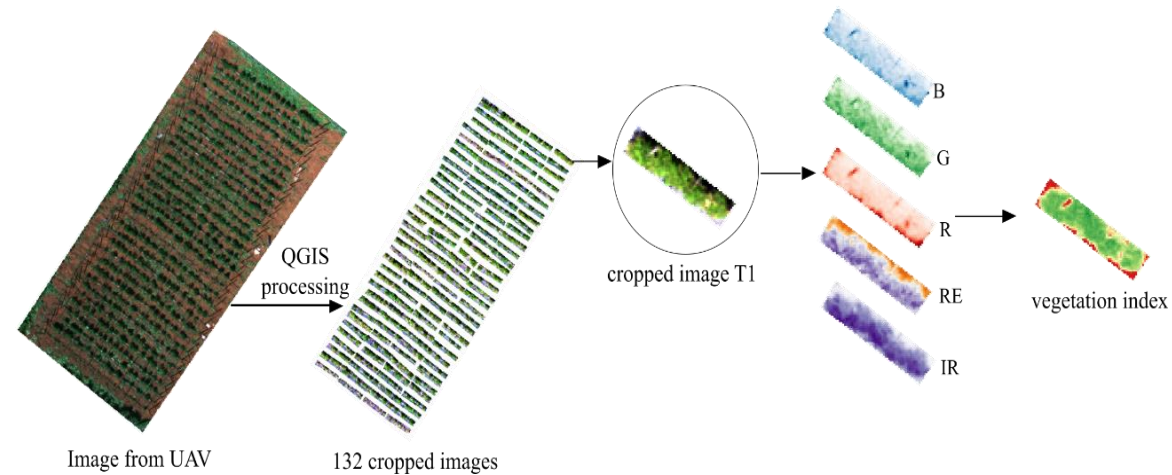


Research Article

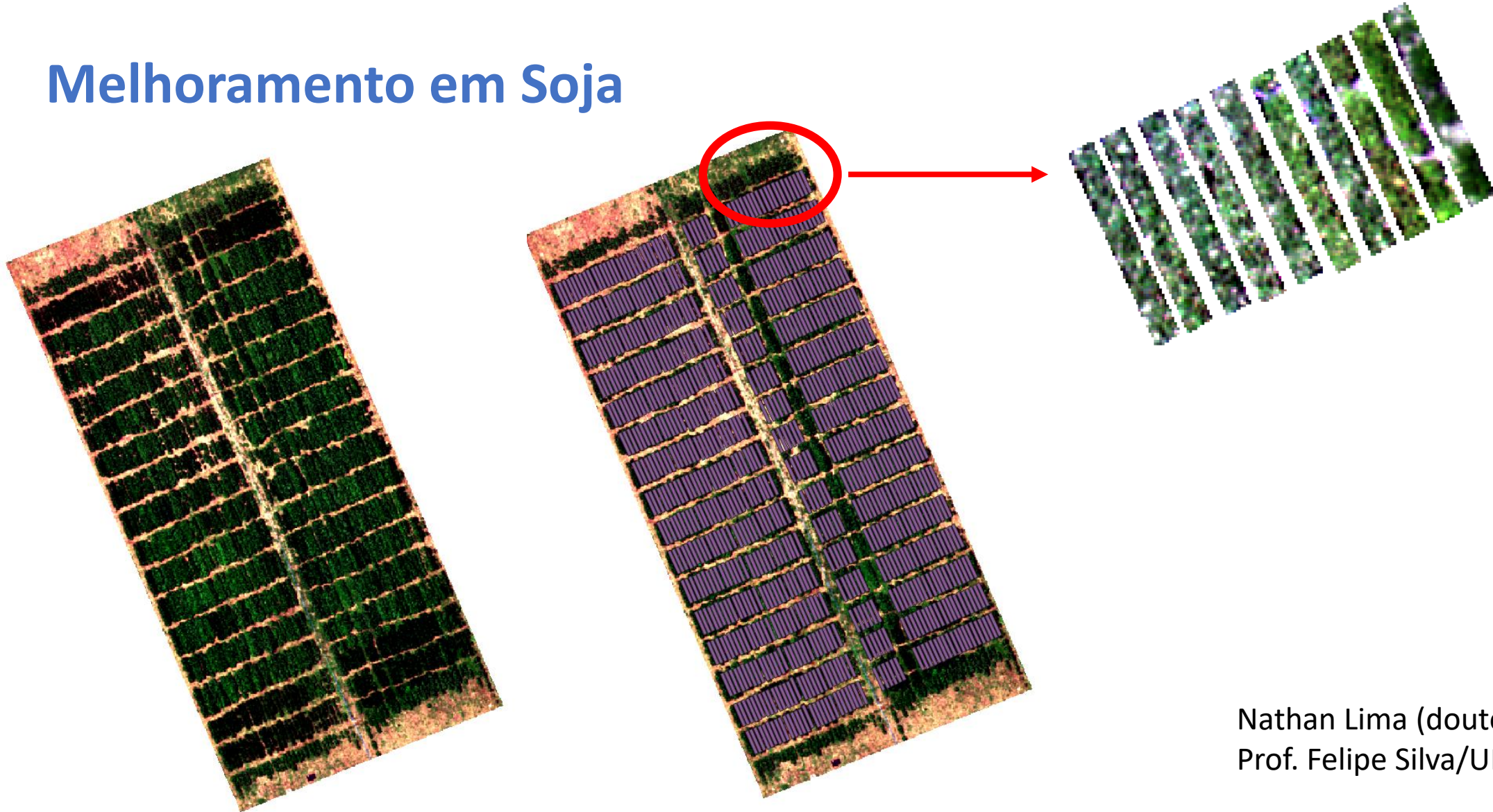
### Remote sensing and machine learning techniques for high throughput phenotyping of late blight-resistant tomato plants in open field trials

Felipe de Oliveira Dias , Domingos Sarvio Magalhães Valente , Carolina Tavares Oliveira, Françoise Dalprá Dariva , Mariane Gonçalves Ferreira Copati & Carlos Nick

Pages 1900-1921 | Received 27 Sep 2022, Accepted 12 Mar 2023, Published online: 03 Apr 2023

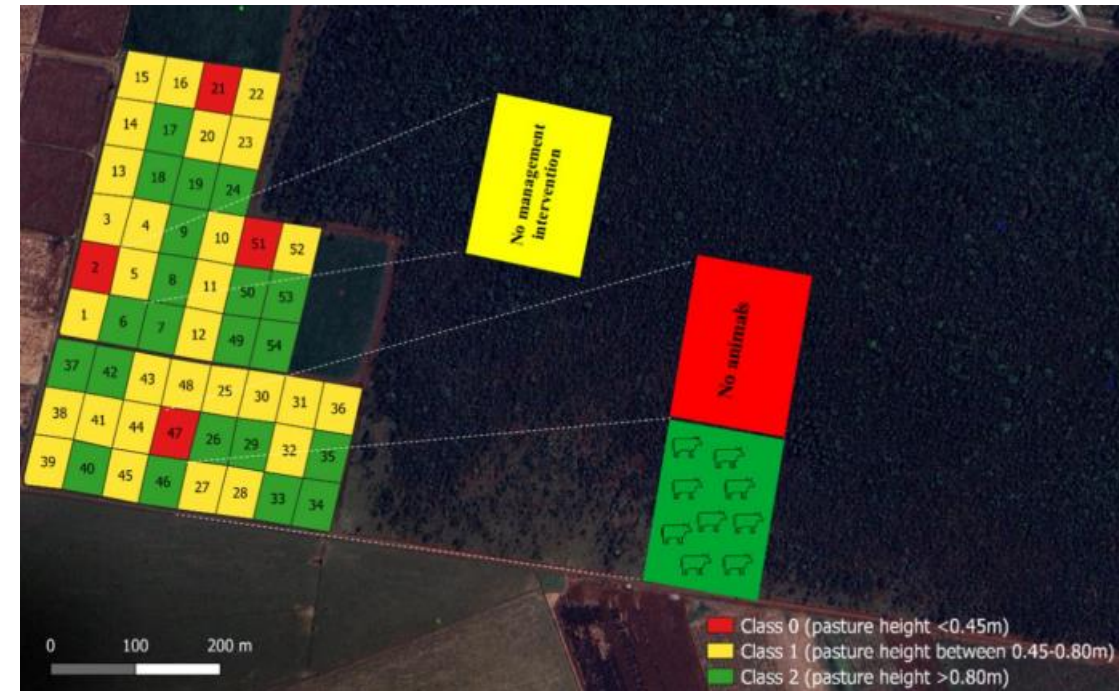
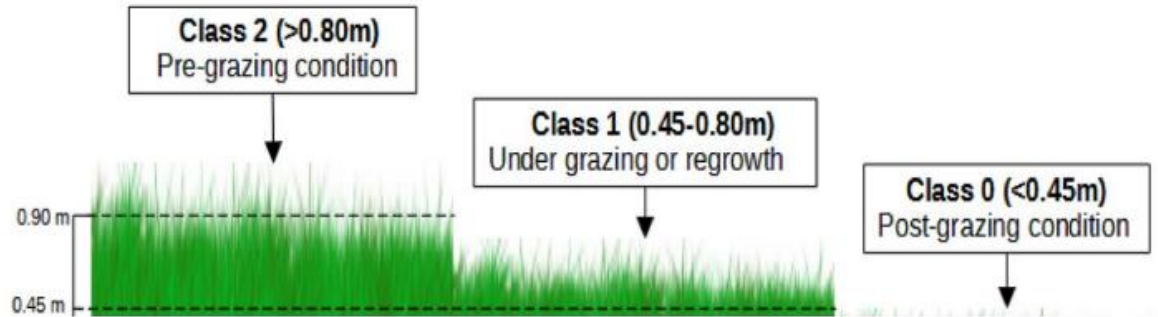


## Melhoramento em Soja



Nathan Lima (doutorando)  
Prof. Felipe Silva/UFV



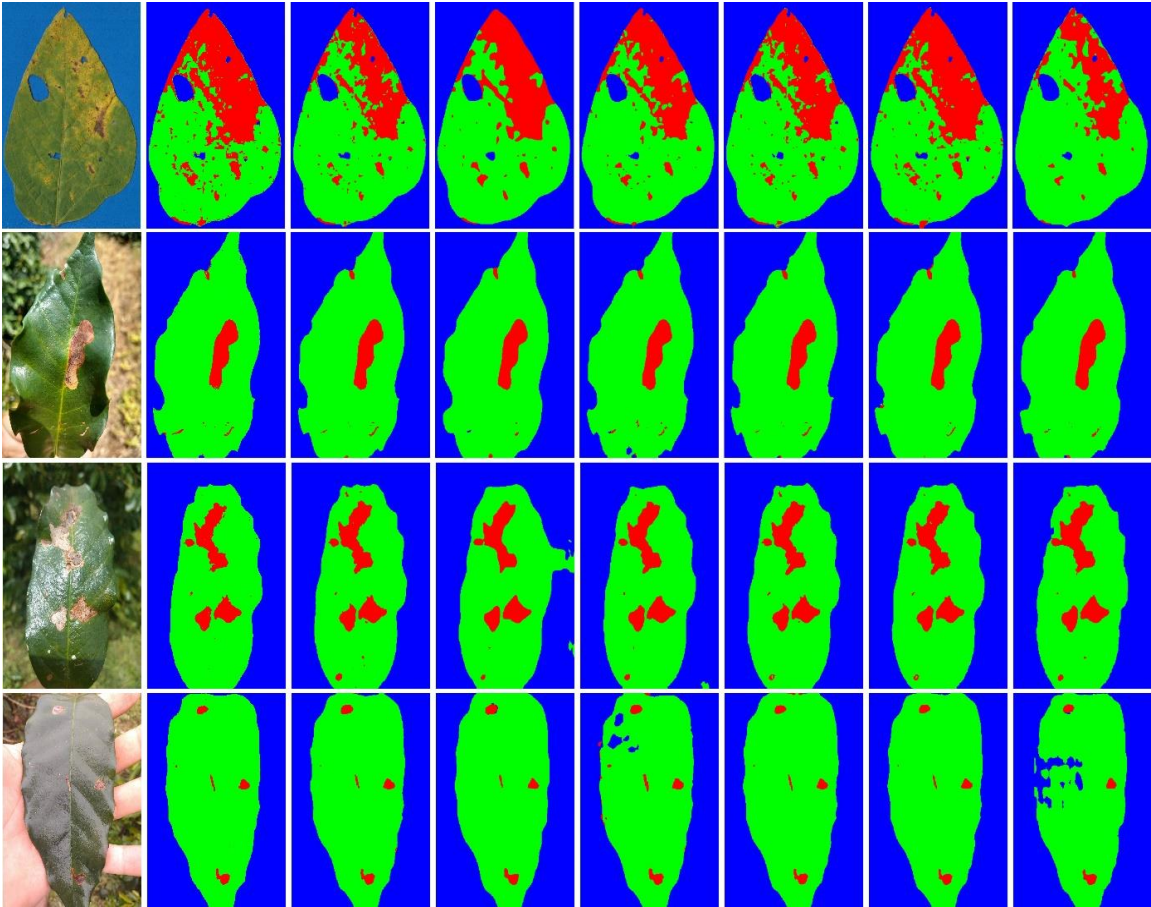
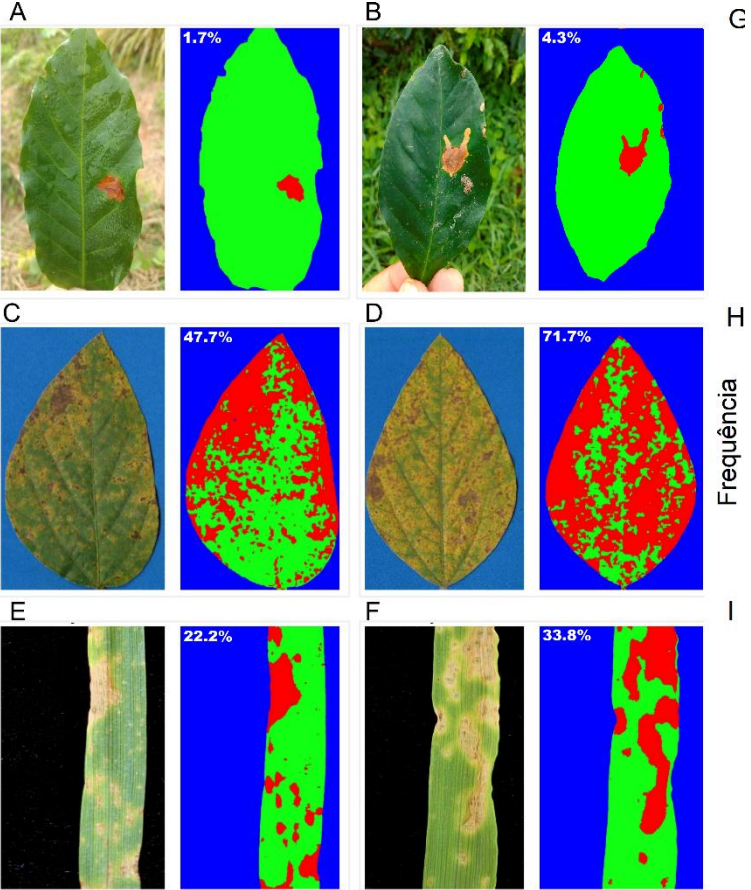


Precision Agriculture  
<https://doi.org/10.1007/s11119-023-10013-z>

### Canopy height and biomass prediction in *Mombaça guinea* grass pastures using satellite imagery and machine learning

Igor Lima Bretas<sup>1</sup> · Domingos Sarvio Magalhães Valente<sup>2</sup> ·  
 Thiago Furtado de Oliveira<sup>2</sup> · Denise Baptaglin Montagner<sup>3</sup> ·  
 Valéria Pacheco Batista Euclides<sup>3</sup> · Fernanda Helena Martins Chizzotti<sup>1</sup>

Paddock ID	Observed height (m)	Observed class	Predicted class
1	0.79	1	1
2	0.46	1	1
43	0.76	1	1
47	0.44	0	0
50	0.83	2	2
51	0.39	0	0



**Deep learning models for semantic segmentation and automatic estimation of severity of foliar symptoms caused by diseases or pests**

Juliano de Paula Gonçalves<sup>a</sup>, Francisco de Assis de Carvalho Pinto<sup>a</sup>, Daniel Marçal de Queiroz<sup>a</sup>, Flora Maria de Melo Villar<sup>a</sup>, Jayme G.A. Barbedo<sup>b</sup>, Emerson M. Del Ponte<sup>c</sup>

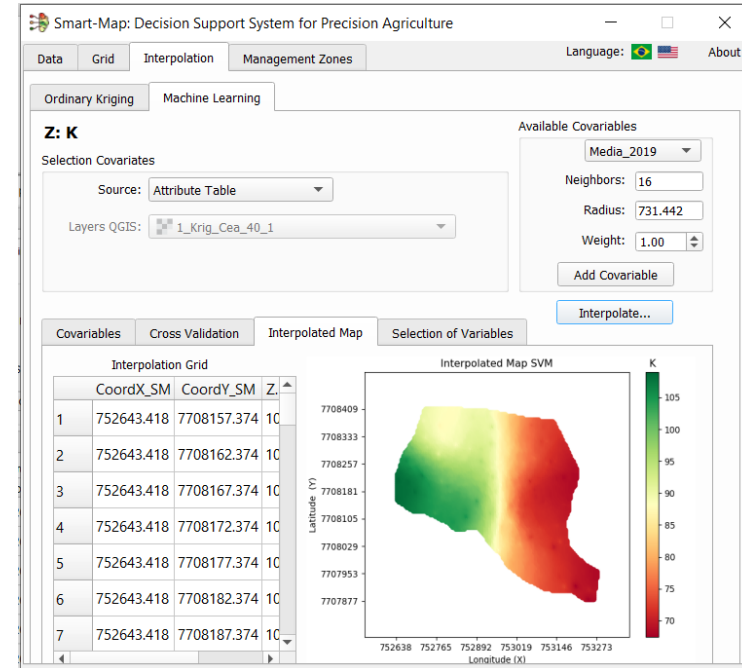
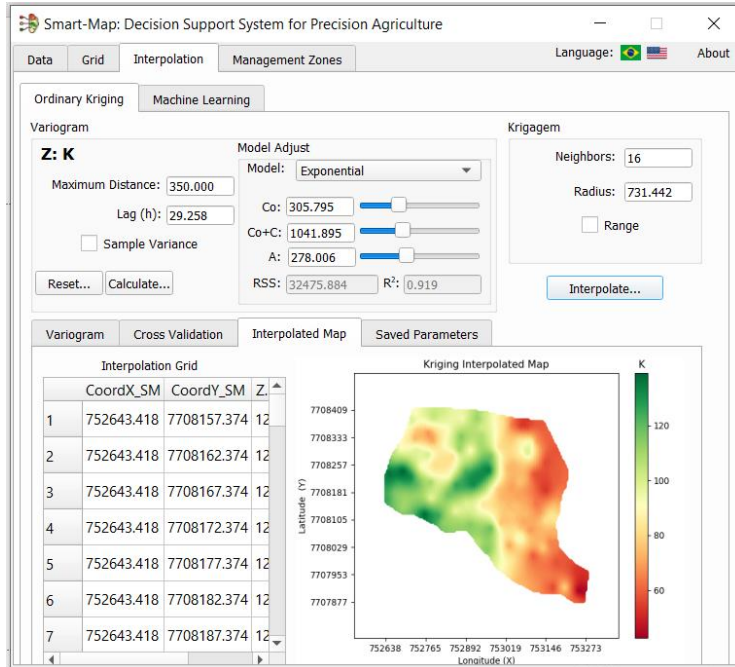


# INTELIGENCIA ARTIFICIAL

## Contagem e classificação de frutos de café



Carolina Tavares  
Mestre UFV



Precision Agriculture (2022) 23:1189–1204  
<https://doi.org/10.1007/s11119-022-09880-9>



Soil mapping for precision agriculture using support vector machines combined with inverse distance weighting

Gustavo Willam Pereira<sup>1</sup> · Domingos Sárvio Magalhães Valente<sup>1</sup> · Daniel Marçal de Queiroz<sup>1</sup> · Nerilson Terra Santos<sup>2</sup> · Elpidio Inácio Fernandes-Filho<sup>3</sup>



Article

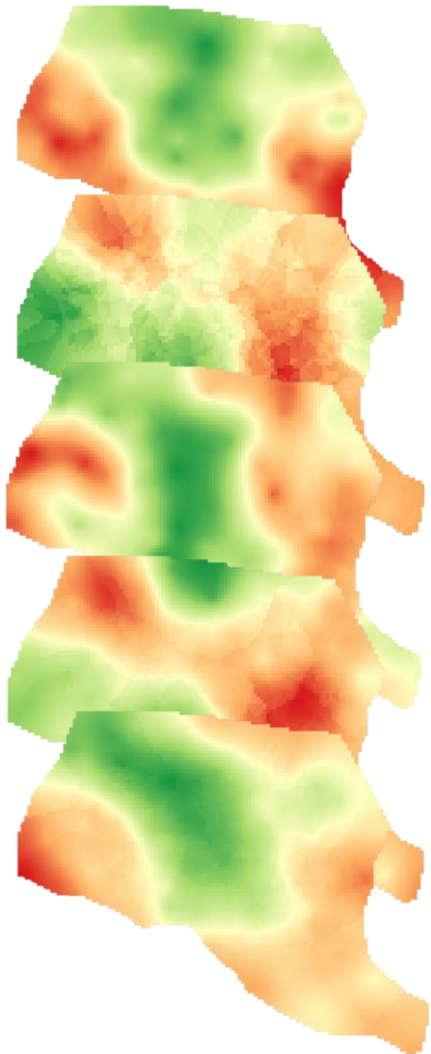
*Smart-Map*: An Open-Source QGIS Plugin for Digital Mapping Using Machine Learning Techniques and Ordinary Kriging

Gustavo Pereira<sup>1</sup>, Domingos Valente<sup>1,\*</sup>, Daniel Queiroz<sup>1</sup>, André Coelho<sup>1</sup>, Marcelo Costa<sup>2</sup> and Tony Grift<sup>3</sup>

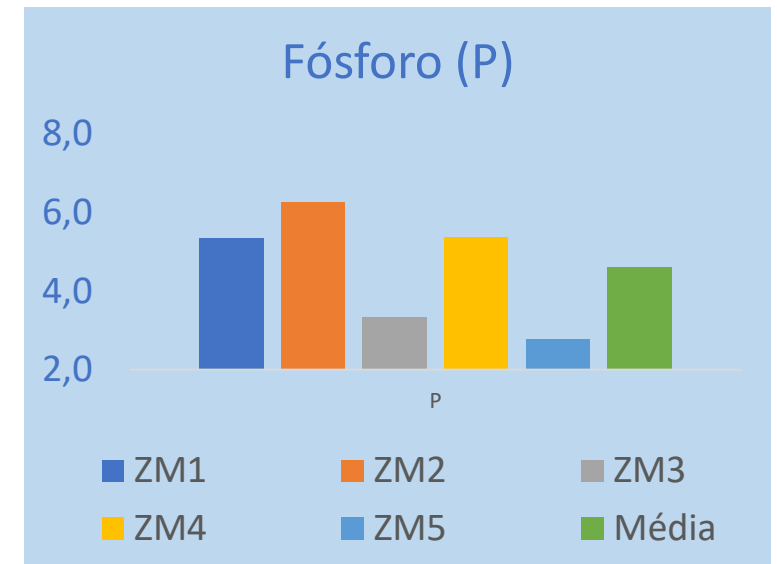
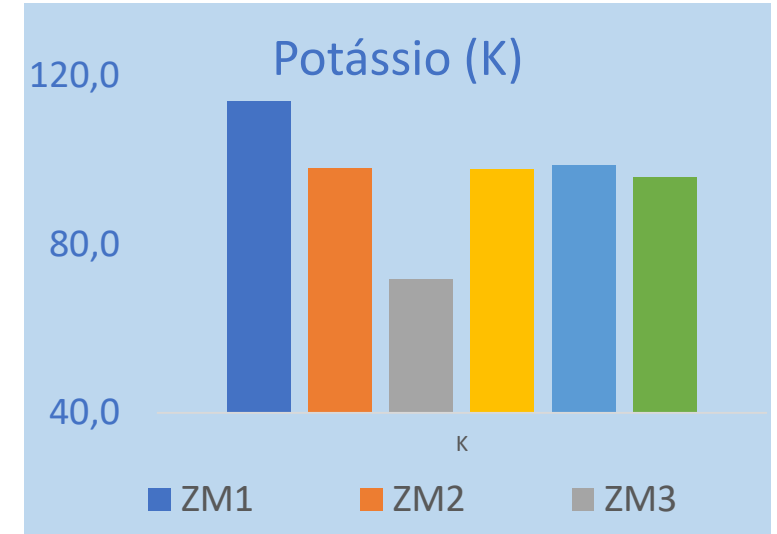
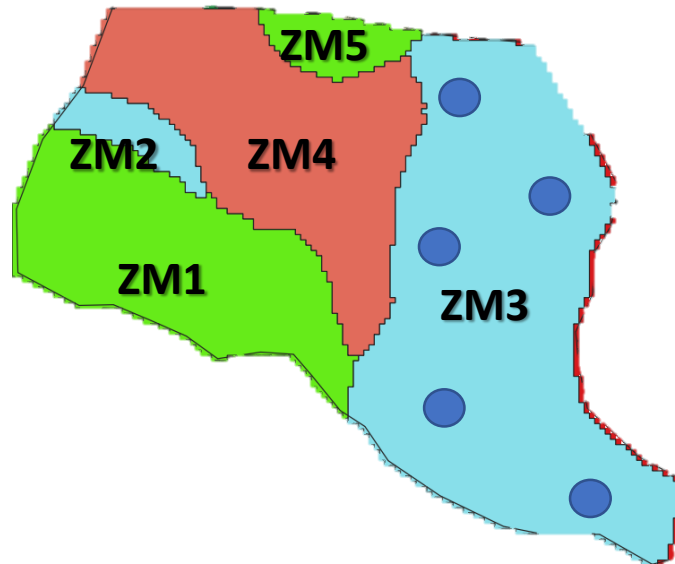


# INTELIGENCIA ARTIFICIAL

## Zonas de Manejo



	Arg	CE20	CTC	CE40	MO
1	51.249	2.269	9.936	1.524	4.088
2	51.227	2.276	9.880	1.533	4.092
3	51.149	2.283	9.919	1.534	4.106
4	51.015	2.289	9.983	1.532	4.141
5	50.831	2.247	10.055	1.530	4.179
6	50.659	2.254	10.176	1.523	4.212
7	50.478	2.261	10.237	1.517	4.253
8	50.290	2.267	10.292	1.509	4.285





## Robô Capinador



EcoRobotix (Empresa Suíça)





AGCO Corp: Fendt Xaver



Jhonata Santana  
Doutorando UFV







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19 e 20 de setembro de 2023

# OBRIGADO!

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 @agriculturadeprecisao

