

RAFAEL MASSAHIRO YASSUE

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RESEARCH INTERESTS

I am a Data Scientist at GDM with experience in plant breeding, quantitative genetics, statistical modeling, genomics, and phenomics. My work involves connecting genomics and high-throughput phenotyping to quantitative genetics and plant breeding. My goal is to solve challenges by applying multidisciplinary approaches. Furthermore, I continuously strive to improve my communication, teamwork, and leadership skills.

EDUCATION

Virginia Tech

Visiting scholar

2022

Blacksburg, United States

Luiz de Queiroz College of Agriculture - University of São Paulo

2018 – 2022

Ph.D., Genetics and Plant Breeding

Piracicaba, Brazil

Luiz de Queiroz College of Agriculture - University of São Paulo

2016 – 2018

M.S., Genetics and Plant Breeding

Piracicaba, Brazil

Western Paraná State University - Unioeste

2011 – 2015

B.Sc. Agronomic Engineering

Mal. C. Rondon, Brazil

EXPERIENCE

Data Scientist Specialist III, GDM

2022-present

- *Develop genomics selection algorithms for soybean and maize breeding programs* *Campinas, Brazil*
- *Provide technical support for the development of genomic, phenomics, and predictive databases and data governance*
- *Develop algorithms for SNP selection, genetic population, diversity analysis, cross prediction, training set optimization, and QAQC*
- *Integrate phenomics, genomics, and enviromics prediction in the context of genomic selection*
- *Manage external consultancies that support genomics, such as genotyping strategy, simulation, and predictive algorithms*

Supervised Internship in Teaching, ESALQ/USP

2019

Monitor of the Genetics Class

Piracicaba, Brazil

Coordinator of plant breeding study group, Gvenck

2019

Coordinated the group's activities

Piracicaba, Brazil

Member of plant breeding study group, Gvenck

2016 – 2019

Promote discussions on relevant plant breeding issues, and soft skills improvement

Piracicaba, Brazil

Academic internship, Soybean breeding, Esalq

2015

Field experimentation, scientific discussion, and data analysis

Piracicaba, Brazil

Intern, Soybean breeding, Coodetec

2013-2014

Hands-on experience in an industry breeding program

Cascavel, Brazil

Undergraduate Research, Plant breeding, Unioeste

2011 – 2015

Learning in methods of research and development of scientific thought

Mal. C. Rondon, Brazil

PRESENTATIONS

- An assessment of the predictive ability of plant growth-promoting bacteria inoculation status and shoot dry mass using hyperspectral images in tropical maize. ASA, CSSA, and SSSA International Annual Meetings. Virtual – 2021
- A low-cost greenhouse-based high-throughput phenotyping platform for genetic studies in maize under inoculation with plant growth-promoting bacteria. NAPB Annual Meeting. Virtual – 2021
- Maize Breeding. Lecture from the course: Introduction to Agronomic Engineering. ESALQ. Virtual – 2021
- Investigating the genetic architecture of the interaction between tropical maize and plant growth-promoting bacteria via high-throughput phenotyping. Translation Plant Science-Discussion Group (TPS-DG). Virginia Tech. Virtual – 2021

- Genetic architecture of the interaction between tropical maize and plant growth-promoting bacteria via high-throughput phenotyping. Genomics and machine learning discussion group. Virginia Tech. Virtual – 2021

PUBLICATIONS

- Fritsche-Neto, R., et al. Elite germplasm introduction, training set composition, and genetic optimization algorithms effect on genomic selection-based breeding programs. *Crop Science*. 2024 . [doi](#)
- Silva, AV., et al. Comparing strategies for genomic predictions in interspecific biparental populations: a case study with the *Rubus* genus. *Euphytica*. 2024 . [doi](#)
- Prado, M., et al. Complementary approaches to dissect late leaf rust resistance in an interspecific raspberry population. *G3 Genes—Genomes—Genetics*. 2024 . [doi](#)
- Grignola, F., et al. Enhancing soybean breeding efficiency: a combined approach of genomic and phenotypic selection. *WSRC11 (Conference)*. 2023. [Link](#)
- Campos, G.R., et al. Construction and genetic characterization of an interspecific raspberry hybrids panel aiming resistance to late leaf rust and adaptation to tropical regions. *Scientific Reports*. 2023. [doi](#)
- **Yassue RM**, et al. Genome-wide association analysis of hyperspectral reflectance data to dissect the genetic architecture of growth-related traits in maize under plant growth-promoting bacteria inoculation. *Plant direct*, 2023. [doi](#)
- Bi Ye, et al. Evaluating metabolic and genomic data for predicting grain traits under high night temperature stress in rice. *G3: Genes, Genomes, Genetics*, 2023. [doi](#)
- Rocha LM, et al. Quantitative trait loci related to growth and wood quality traits in *Eucalyptus grandis* W. Hill identified through single-and multi-trait genome-wide association studies. *Tree Genetics & Genomes*, 2022. [doi](#)
- **Yassue RM**, et al. Classification of plant growth-promoting bacteria inoculation status and prediction of growth-related traits in tropical maize using hyperspectral image and genomic data. *Crop Science*, 2022. [doi](#)
- Galli G, et al. Automated Machine Learning: a case study of genomic “image-based” prediction in maize hybrids. *Frontiers in Plant Science*, 2022. [doi](#)
- **Yassue RM**, et al. On the genetic architecture in a public tropical maize panel of the symbiosis between corn and plant growth-promoting bacteria aiming to improve plant resilience. *Molecular Breeding*, 2021. [doi](#)
- **Yassue RM** et al. A low-cost greenhouse-based high-throughput phenotyping platform for genetic studies: a case study in maize under inoculation with plant growth-promoting bacteria. *The Plant Phenome Journal*, 2021. [doi](#)
- **Yassue RM**, et al. CV- α : designing validation sets to increase the precision and enable multiple comparison tests in genomic prediction studies. *Euphytica*. 2021. [doi](#)
- Souza RS, et al. Combining ability for the improvement of vegetable soybean, *Agronomy Journal*. 2020. [doi](#)
- Espolador FG, et al. Assessing tolerance to Asian soybean rust in soybean inbred lines from exotic and adapted crosses. *Euphytica*, 2020. [doi](#)
- **Yassue RM**, et al. Uni and multivariate approaches for diallel analysis in early generation trials for soybean tolerance to rust. *Bragantia*. 2019. [doi](#)

ADDITIONAL TRAINING

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| • Workshop on Databricks | 2023 |
| • Multi-Omics-Data-Assisted Genomic Prediction Incorporating Genotype-by-Environment Interaction | 2022 |
| • Introduction to Machine Learning with Python | 2021 |
| • Workshop on Analysis of Breeding Experiments using ASReml-R | 2020 |
| • Workshop on Crop Growth Models Applied for Plant Breeding | 2020 |

- Treinamento genotype to phenotype models in plant breeding 2019
- System biology and gene networks inference: application to livestock 2019
- IV Workshop on Longitudinal and Incomplete Data 2018
- Quantitative Genetics and Genomics 2018
- New methodologies for high-resolution mapping and development of molecular 2017

SKILLS

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|-------------------------|------------------------|-------------|--|
| • Quantitative genetics | • Statistical modeling | • Phenomics | • R, Python, and Julia |
| • Plant breeding | • Image processing | • Genomics | • Markdown, GitHub,
and \LaTeX |

LANGUAGES

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|-----------------------|----------------------|--------------------------|
| • Portuguese (native) | • English (advanced) | • Spanish (Intermediate) |
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REFERENCES

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- Prof. Dr. Roberto Fritsche-Neto - Assistant Professor at LSU AgCenter – rfneto@agcenter.lsu.edu
 - Prof. Dr. Gota Morota - Associate Professor of quantitative genetics at Virginia Tech – morota@vt.edu
 - Prof. Dr. James Chen - Assistant Professor of Animal Data Sciences at Virginia Tech – niche@vt.edu