Tairone P. Leão, Ph.D.

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Education

Doctorate level degrees:

Ph.D. Geology, University of Tennessee 2009
Effects of water content and salinity on soil electrical properties at 50 MHz: structural and textural interactions. Advisor: Edmund Perfect

D.Sc. Agronomy, University of Sao Paulo 2005
Development and comparison of methods for soil physical quality evaluation. Advisor: Alvaro Pires da Silva

Masters level degree:

M.S. Agronomy, University of Sao Paulo 2003
Least limiting water range in different grazing systems and pasture management strategies. Advisor: Alvaro Pires da Silva

Undegraduate degrees:

Lic. Physics, University of Brasilia 2019
No thesis requirement.

B.Sc. Agronomy, University of Rio Verde 2001
Concentration and content of nutrients in leachate of a medium textured soil columns after application of swine sewage sludge. Advisor: Gilson Pereira Silva

Employment

University of Brasilia

Associate Professor	2018 – present
Adjunct Professor (tenured)	2012 – 2018
Adjunct Professor	2009 – 2012

University of Tennessee 2004 – 2009

Graduate Teaching Assistant	2007 – 2008
Graduate Research Assistant	2005 – 2007
Graduate Teaching Assistant	2004 – 2005

Administration

Head of the "Soils"division at the Faculty of Agronomy and Veterinary Medicine of the University of Brasilia (Equivalent to Department Head) 2016 – 2017

Member of the undegraduate program in Agronomy council 2009 – present

Member of the graduate program in Agronomy council 2019 – present

Member of the graduate program in Agronomy admissions council, 2012 – present

Teaching – indicates hours per semester when taught

University of Brasilia

- Soil Physics (60h, Graduate)
- Soil Chemistry (20h, Graduate)
- Data Analysis for Soil Science (60h, Graduate)
- Pedology (30h, Specialization – professional post-graduate)
- Fundamentals of Soil Science (90h, Undergraduate)
- Soil Physics (60h, Undegraduate)
- Sustainable Use of Tropical Soils (60h, Undegraduate)
- Microinformatics in Agriculture (30h, Undegraduate)
- Introduction to SAS Software (Extension, short-course)

University of Tennessee (Teaching Assistant)

- Environmental Geology (20h)
- Principles of Hydrogeology (20h)
- Data Analysis for Geoscientists (20h)

"Paulo Freire" Public Highschool - Brasilia (Internship)

- Thermodynamics module (Second year highschool Physics)

Software

SAS, [R], C/C++, LaTeX, Hydrus 1D/2D, python, Fortran, OpenFOAM

Editorial work

Associate editor - Brazilian Journal of Soil Science 2013 – 2018

Associate editor - Scientia Agricola 2013 – 2015

Reviewer - 20+ journals

Awards

Coffee Cup Award for Highest Graduate G.P.A. (3.93) University of Tennessee 2008

Highest Graduate G.P.A. (3.93) University of Tennessee 2007

University of Tennessee Institute for a Secure and Sustainable Environment Scholarship, University of Tennessee Knoxville 2007

Outstanding Achievement in Interdisciplinary Research. University of Tennessee 2006

Excellence in Graduate Coursework. University of Tennessee 2006

University of Tennessee Waste Management Research and Education Institute Scholarship, University of Tennessee Knoxville 2005

Funding - as a P.I.

Dispersion and particle size analysis of surface horizons of Oxisols under agriculture and native vegetation in the Federal District, Brazil. Foundation of Research Support of the Federal District (FAPDF) Grant number: 0193.001701 / 2017 2018 – 2020

Time domain reflectometry (TDR) for estimating and monitoring water content in tropical soils. National Council for Scientific and Technological Development (CNPq) Grant number: 473020/2013-0 2014–2016

Publications

Preprints

1. Leao, T.P. 2022. Physics of soil and other natural porous media. Arxiv `https://arxiv-export-lb.library.cornell.edu/abs/2210.07716`

Journal Articles

1. Maia, F.C.O., Bufon, V.B., Leao, T.P. 2022. Vegetation indices as a tool for mapping sugarcane management zones. Precision Agriculture.
2. Leao, T.P., Wendt, T.G., Campos, G.A.S., de Figueiredo, C.C. 2022. Organic Matter, Agricultural Use, and Dispersion of Ferralsols for Grain Size Analysis. *Communications in Soil Science and Plant Analysis* 1–15
3. Leao, T.P., da Costa, B.F.D., Bufon, V.B., Aragón, F.F.H. 2020. Using time domain reflectometry to estimate water content of three soil orders under savanna in Brazil. *Geoderma Regional* 21: e00280
4. Leao, T.P., Neves, H.V., Campos, A.F.C., Pinheiro, T.D., de Figueiredo, C.C. 2020. A conceptual model for stability and surface chemistry of oxidic soil dispersions. *Colloids And Surfaces A-Physicochemical And Engineering Aspects* 603:125–214.
5. Leao, T.P. 2020. Modeling Magnetic Minerals Effect On Water Content Estimation In Porous Media. *Progress in Electromagnetics Research C* 106:215-228

6. Monteiro, N.O.C., de Alencar, E.R., Souza, N.O.S., Leao, T.P. 2020. Ozonized Water in the Preconditioning of Corn Seeds: Physiological Quality and Field Performance. *Ozone-Science & Engineering* 43:436–450
7. Leao, T.P. 2019. Water retention and penetration resistance equations for the least limiting water range. *Scientia Agricola* 76:172–178
8. Pereira, R.M., Leao, T.P., Sandri, D., Baptista, G.M.M., da Cunha, L.S. 2019. Air temperature modelling in Distrito Federal - Brazil region with atmospheric airs sensor data. [Modelagem da Temperatura do Ar na Regiao do Distrito Federal - Brasil, por meio de dados atmosfericos do Sensor AIRS]. *Revista Brasileira de Meteorologia* 34:275–282
9. Figueiredo, C.C., Coser, T.R., Moreira, T.N., Leao, T.P., Vale, A. T., Paz-Ferreiro, J. 2019. Carbon Mineralization in a Soil Amended with Sewage Sludge-Derived Biochar. *Applied Sciences-Basel* 9:4481
10. Maia, F.C.O., Bufon, V.B. , Leao, T.P. 2018. Retention Curves And Available Water Capacity In Latosols. *Engenharia Agricola* 38:546–552
11. Cajamarca, S.M.N., Alencar, E.R., Santana, A.P., Leao, T.P., Ferreira, W.F.S. 2017. Efeito do ozonio na qualidade pos-colheita de morangos produzidos em sistema organico. *Boletim Centro de Pesquisa e Processamento de Alimentos* 35:1–12
12. de Lima, R.P., da Silva, A.R., da Silva, A.P., Leao, T.P., Mosaddeghi, M.R. 2016. soilphysics: An R package for calculating soil water availability to plants by different soil physical indices. *Computers and Electronics in Agriculture* 120:63–71
13. Leao, T.P. 2016. Particle size distribution of Oxisols in Brazil. *Geoderma Regional* 7:216–222
14. Leao, T.P., Perfect, E. , Tyner, J.S. 2015. Evaluation of Lichtenecker's Mixing Model for Predicting Effective Permittivitty of Soils at 50 MHz. *American Society of Agricultural and Biological Engineers. Transactions* 58:83–91
15. Busato, J.G., Papa, G., Canellas, L.P., Adani, F., de Oliveira, A.L., Leao, T.P. 2015. Phosphatase activities and its relationship with physical and chemical parameters during vermicomposting of filter cake and cattle manure. *Journal of the Science of Food and Agriculture* 96
16. Leao, T.P., Silva, A.P., Tormena, C.A., Giarola, N.F., de Figueiredo, G.C. 2014. Assessing the immediate and residual effects of chiseling for ameliorating soil compaction under long-term no-tillage. *Journal of Soil and Water Conservation* 69:431–438
17. Sena, M.C., Leao, T.P., Von Borries, G.F., Turnes, O. 2014. Análise de formulaćões NPK fiscalizadas pelo mapa, de 2008 a 2010. *Revista Brasileira de Ciência do Solo (Impresso)* 38:1207–1214
18. Leao, T.P., Tuller, M. 2014. Relating soil specific surface area, water film thickness, and water vapor adsorption. *Water Resources Research* 50
19. Falcao, J.V., Lacerda, M.P.C., Mendes, I.C., Leao, T.P., Carmo, F.F. 2013. Qualidade do solo cultivado com morangueiro sob manejo convencional e organico. *Pesquisa Agropecuaria Tropical (Online)* 43:450.
20. Leao, T.P., Guimaraes, T.L.B., de Figueiredo, C.C., Busato, J.G., Breyer, H.S. 2013. On Critical Coagulation Concentration Theory and Grain Size Analysis of Oxisols. *Soil Science Society of America Journal* 77:1955

21. Sato, J.H., Figueiredo, C.C., Leao, T.P., Ramos, M.L.G., Kato, E. 2012. Materia organica e infiltracao da agua em solo sob consorcio milho e forrageiras. *Revista Brasileira de Engenharia Agricola e Ambiental (Online)* 16:189–193

22. Busato, J.G., Leao, T.P., Baldotto, M.A., Canellas, L.P. 2012. Organic matter quality and dynamics in tropical soils amended with sugar industry residue. *Revista Brasileira de Ciencia do Solo (Impresso)* 36:1179–1188

23. Leao, T.P., Gentry, R. 2011. Numerical modeling of the effect of variation of boundary conditions on vadose zone hydraulic properties. *Revista Brasileira de Ciencia do Solo (Impresso)* 35:263–272

24. Leao, T.P., Perfect, E., Tyner, J.S. 2010. Estimation of Soil Water Content Using a 50 MHz Impedance Sensor: Soil Texture, Structure, and Salinity Interactions. *Transactions of the ASABE* 53:163–170

25. Leao, T.P., Perfect, E. 2010. Modeling water movement in horizontal columns using fractal theory. *Revista Brasileira de Ciencia do Solo (Impresso)* 34:1463

26. Leao, T.P., Perfect, E., Tyner, J.S. New semi-empirical formulae for predicting soil solution conductivity from dielectric properties at 50MHz. *Journal of Hydrology (Amsterdam)* 393:321–330

27. Silva, A. P. , Leao, T.P., Tormena, C. A. , Goncalves, A. C. A. 2009. Determinacao da permeabilidade ao ar em amostras indeformadas de solo pelo metodo da pressao decrescente. *Revista Brasileira de Ciencia do Solo (Impresso)* 33:1535–1545

28. van den Berg, E.H., Perfect, E., Tu, C., Knappett, P.S.K., Leao, T.P., Donat, R.W. 2009. Unsaturated hydraulic conductivity measurements with centrifuges: a review *Vadose Zone Journal* 8: 531–547

29. Kavalieri, K.M.V., Silva, A.P., Tormena, C.A., Leao, T.P., Dexter, A.R. 2009. Long term effects of no-tillage on dynamic soil physical properties in a Rhodic Ferrasol in Parana, Brazil *Soil and Tillage Research* 130: 158–164

30. Leao, T.P., Silva, A.P. 2006. A statistical basis for selecting parameters for the evaluation of soil penetration resistance *Scientia Agricola* 63(6): 552–557

31. Leao, T.P., Silva, A.P., Macedo, M.C.M., Imhoff, S., Euclides, V.P.B. 2006. Least limiting water range: an indicator of soil degradation after conversion of Brazilian savanna into pasture *Soil and Tillage Research* 88: 279–285

32. Lima, C.L.R., Silva, A.P., Imhoff, S., Leao, T.P. 2006. Evaluation of soil resistance to penetration underlying soil load support capacity estimate (In Portuguese, with English abstract) *Brazilan Journal of Soil Science* 30: 217–223

33. Leao, T.P., Silva, A.P., Perfect, E., Tormena, C.A.. 2005. An algorithm for calculating the least limiting water range of soils *Agronomy Journal* 97: 1210–1215

34. Lima, H.V., Lima, C.L.R., Leao, T.P., Cooper, M., Silva, A.P., Romero, R.E. 2005. Agricultural machinery traffic and alterations in biopores under an orange orchard (In Portuguese, with English abstract) *Brazilan Journal of Soil Science* 29: 677–684

35. Leao, T.P., Silva, A.P., Macedo, M.C.M., Imhoff, S., Euclides, V.P.B. 2004. Least limiting water range in the evaluation of continuous and short-duration grazing systems (In Portuguese, with English abstract) *Brazilan Journal of Soil Science* 28: 415–422

36. Lima, C.L.R., Silva, A.P., Imhoff, S., Lima, H.V., Leao, T.P. 2004. Compaction heterogeneity of a haplustox under an orange orchard (In Portuguese, with English abstract) *Brazilan Journal of Soil Science* 28: 409–414

37. Leao, T.P., Silva, A.P. 2004. A simplified Excel algorithm for estimating the least limiting water range of soils *Scientia Agricola* 61: 649–654

38. Lima, C.L.R., Silva, A.P., Imhoff, S., Leao, T.P. 2004. Soil compressibility under non-irrigated and irrigated short duration grazing systems (In Portuguese, with English abstract) *Brazilian Journal of Soil Science* 28: 945–951

Mentoring

1. Graduate - year of conclusion only

Geovana Alves Santos Campos (Masters in Agronomy)	2021
Felipe Cardoso de Oliveira Maia (Masters in Agronomy)	2019
Leandro Guimaraes Cruvinel e Palos (Masters in Agronomy, co-advisor)	2019
Helen Crisina Vieira Neves (Masters in Agronomy)	2018
Bruna Domingues Freire da Costa (Masters in Agronomy)	2016
Mariana Coelho de Sena (Masters in Agronomy)	2012

2. Undergraduate

Isac Jefereson Ferreira de Sousa (Senior thesis)	2018
Ana Clara Barbosa de Souza (Senior thesis)	2019
Lara Guedes de Aquino (Senior thesis)	2016
Thalita Luzia Barros Guimaraes (Senior thesis)	2016
Felipe Cardoso de Oliveira Maia (Senior thesis)	2016
Victor Soares Vieira Magalhaes (Senior thesis)	2010
Thatiane Degrandis Wendt (Undergraduate research assistant)	2016–2018
Lara Guedes de Aquino (Undergraduate research assistant)	2014–2015
Fernando Alberto de Sousa Calisto (Undergraduate research assistant)	2014–2015
Thalita Luzia Barros Guimaraes (Undergraduate research assistant)	2012–2013
Aldo Soares Filho (Undergraduate research assistant)	2011-2013
Paulo Henrique de Paula de Oliveira (Undergraduate research assistant)	2010–2011

Professional Presentations

1. 2017. (Re)uniting soil physics, soil chemistry and condensed matter physics. *Brazilian Soil Physics Meeting* CENA/USP.

2. 2008. Investigation of the effects of soil, salinity and disturbance on the estimation of water content using a 50 MHz impedance sensor (oral presentation).

3. 2007. Water content estimation from dielectric permittivity measured using the Hydra Probe in disturbed and undisturbed soil samples (45 minutes oral presentation). *The Second International Symposium on Soil Water Measurement Using Capacitance, Impedance and Time Domain Transmission. Paltin International: Beltsville MD.*

4. 2006. A Cantor bar model for the effective hydraulic conductivity of partially-saturated layered soil (oral presentation). *18th World Congress of Soil Science, Philadelphia, PA.*

5. 2006. A Cantor bar model for the effective hydraulic conductivity of partially-saturated layered soil (oral presentation). *Geological Society of America Southeast Meeting, Knoxville, TN.*

Lattes CNPq

A detailed list of other professional activities and abstracts is available on request and can be found on the Brazilian Lattes curriculum platform (In Portuguese): `http://lattes.cnpq.br/7920357457851780`