

Visit France INRAE_ June 11-17

Ignacio A. Ciampitti, Professor, Farming Systems, Department of Agronomy, Kansas State University, ORCID: <https://orcid.org/0000-0001-9619-5129>

Objectives of this visit:

- 1) "Establish a collaborative work between US and France on (i) defining reference "critical N curves" and (ii) an open data initiative for enhancing the diagnostic of nutrient status across different crop species;
- 2) "Expand the utilization of "critical N curves" as NNI diagnosis for "genotype-environment-management" analysis at different spatial and temporal scale;
- 3) "Discuss potential integration of remote sensing and crop modeling approaches to develop a high-throughput phenotyping for NNI in crop species;
- 4) "Extend the NNI concept to other nutrients (P, K, S) for a more integrated vision of crop nutrition diagnosis and to investigate co-limitations; and
- 5) "Discuss the integration and evaluation of NNI for breeding for efficient use of nutrient resource in cropping systems.

More information about Dr. Ciampitti

Dr. Ciampitti is a full professor, crop ecophysiologicalist with expertise in stress adaptation and farming systems with experience in many field crops. The mission of the Ciampitti lab, <https://ciampittilab.wixsite.com/ciampitti-lab>, is to foster excellence in research and service, devote to the innovation and focusing on integrating new technologies and data science for improving overall prediction of the behavior of farming systems. He is also the Director of an international consortium for digital farming and development of decision support tools, <https://digitalconsortium.wixsite.com/dqfsc>, developing an interdisciplinary and solution-oriented geospatial framework, integrating remote sensing, farming systems modeling, and geospatial data layers to provide innovative data products to take actions towards development of more resilient farming systems.

Dr Ignacio CIAMPITTI collaborates with Gilles LEMAIRE and Jean-François BRIAT and several other french colleagues for extending the concept of « critical N dilution curve » and « NNI diagnosis » for genotype-environment-management analysis and crop phenotyping :

CIAMPITTI, I., FERNANDEZ, J., TAMAGO S., LEMAIRE, G., B. ZHAO, MAKOWSKI, D. 2020. Does the critical N dilution curve for maize crop vary across genotype x environment x management scenarios? - A Bayesian analysis. *European Journal of Agronomy*, 123. <https://doi.org/10.1016/j.eja.2020.126202>

LEMARE, G., CIAMPITTI, I., 2020 Crop mass and N status as prerequisite co-variables for unravelling Nitrogen Use Efficiency across genotype-by-environment-by-management interactions. A review. *MDPI/Plants* 9, 1309; doi:10.3390/plants9101309

FERNANDEZ, J., A., LEMAIRE, G., BELANGER, G., GASTAL, F., A., MAKOWSKI, D., CIAMPITTI, I., 2021. Revisiting the critical nitrogen dilution curve for tall fescue: A quantitative analysis. *European Journal of Agronomy*, 131. <https://doi.org/10.1016/j.eja.2021.126380>

CIAMPITTI, I.A., LEMAIRE, G., 2022. From use efficiency to effective use of nitrogen: A dilemma for crop breeding improvement. *Science of the Total Environment* 826 (2022) 154125. <http://dx.doi.org/10.1016/j.scitotenv.2022.154125>.

CIAMPITTI, I.A., BRIAT, J-F., GASTAL, F., LEMAIRE, G., 2022. Re-defining Nitrogen Use Efficiency for Sustainable Crop Improvement. *Nature Food*, (submitted).