

K-STATE RESEARCH SHOWCASE

Dr. Ignacio A. Ciampitti | Department of Agronomy | Leader KSUCROPS Production Lab

KSUCROPS RESEARCH FOCUS

The KSUCROPS team focuses on dissecting complex genotype x environment x management practices interaction (herein termed as G x E x M). Specific topics and areas of expertise:

- Management practices in corn, soybean, sorghum and canola systems.
- Application of Precision Ag tools such as utilization of unmanned aerial vehicle (UAS), high-resolution satellite imagery, zone-management and technologies related to site-specific productive and sustainable farming systems.
- Yield Gaps and Potential Yield levels (integrated research in closing yield gaps).
- Crop Physiology and Ecology (Nutrient and Plant Mass Stoichiometric Ratios).
- Review Analysis and Uses of Modern Statistical Tools for Applied Research:
 - Synthesis, Meta-Analysis, Multivariate-Analysis, and Quantile Regression.

RESEARCH CAPABILITIES

Our team is well prepared and acquired expertise/recognition on the areas concerning crop ecology (field research at canopy-scale), synthesis and review analysis (managing large volume of data), and dealing with the farming system complexity of integrating data and technologies to provide site-specific solutions (implementation of On-Farm Research Program).

The KSUCROPS Team supports all individuals and has core values such as:

1. **Support & help** each other regardless of the task.
2. **Communicate** with your team members regularly, listen, answer and ask questions.
3. **Be united and enthusiastic**, work together towards a common goal.
4. **Be creative** and promote team activities.
5. **Be punctual**, keep clear objectives, and delivering not only quantity but quality work.

Crop Production Team



EXPERIENCE

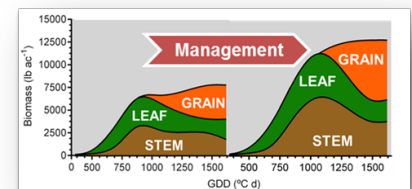
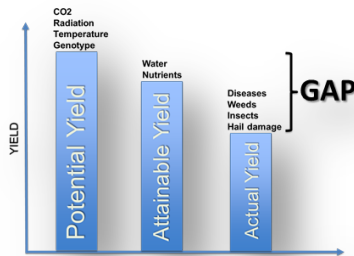
- Ph.D. Crop Physiology/Cropping Systems, Purdue University, 2012
- M.S. Fertility/Plant Nutrition, University of Buenos Aires, ARG, 2009
- B.S. Agronomy, University of Buenos Aires, ARG, 2005

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Guillermo Balboa | PhD Student | Department of Agronomy | KSUCrops Production Lab

RESEARCH FOCUS

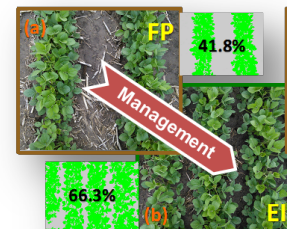
Crop yield potential is genetically determined, although maximum yield is greatly influenced by diverse management practices including seeding rate, variety selection, fertilizer rates, row spacing, among several others. Thus, final attainable yield is the result of a complex interaction between genotype (G) x environment (E) and management practices (M) components (G x E x M complexity). A pragmatic approach to quantify “yield gaps” is to investigate the effect of diverse cropping systems practices and how the combination of these practices is affecting plant nutrition and physiological plant components. Agronomic practices are the main components of the farmer decision-making process. Thus, quantifying yield gaps by properly dissecting the contribution of the main cropping systems factors needs further evaluation. My research study is primarily focused in determining plant nutrition and physiological factors impacting yield production at the farmer-scale.



RESEARCH CAPABILITIES

Working in a team is the best way to achieve better results taking advantages of the different qualifications in the group and making sure to be efficient to reach our goals. Some of the cornerstone where I based my research are:

- **Field studies:** working on corn and soybean mainly measuring different traits across the season to give answer to complex research hypothesis with a systemic approach
- **GIS and Geostatistics:** nowadays powerful tools like GIS and geostatistics can help to have a better understanding of the complex relations in any production system
- **Precision Ag On farm Research:** association between farmers and researcher to answer key questions by getting involved in the process of generating and analyzing the information together.



- **Extension:** particularly interested in find better ways to share research result with colleagues and farmers. New communication technologies play an essential role in this process.



EXPERIENCE

Before joining to K-State I was working as Professor and Researcher at Rio Cuarto National University in Argentina, the main focus of our research was crop production and nutrition and site specific management in corn and soybean. We also conducted studies in high yielding corn. During my Master thesis I worked with precision AG testing a model to diagnose site specific nitrogen rates in corn. On August 2014 I got a Fulbright Scholarship and I joined to KSUCROPS Production Team to pursue my PhD at K-State.

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Sebastian Varela | PhD Student | Department of Agronomy | KSUCROPS Production Lab

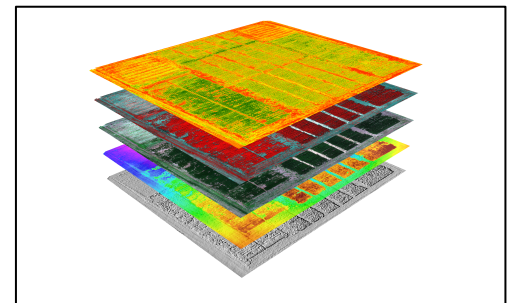
RESEARCH FOCUS

My research interests are in crop production with emphasis in multiscale remote sensing for crop forecast. One of the objectives of my research is to find new insights of UAS (Unmanned Aerial Systems) as in-seasonal diagnosis tools by combining ultra-high resolution imagery and machine learning techniques. A second objective of my research is the integration of UAS and satellite data for in-seasonal growth and yield forecast linked to site-specific management practices.



RESEARCH CAPABILITIES

I am comfortable leading projects based on the integration of crop management and technology, focusing in high scalable topics optimizing productivity and environmental impact. Skills I have developed include:



- **Leadership:** Lead interdisciplinary projects, connect researchers with different areas of knowledge.
- **Organization:** Essential in all steps of any activity, before, during and after.
- **Innovative thinking:** analytic and holistic understanding for
- **Commitment:** The attitude of working hard towards expectations.
- **Group work and individual work:** Relate well while sharing responsibilities and opinions, and focus for individual assignments.



- GIS and Remote Sensing software: ENVI, ERDAS, ArcMap, ArcScene, Pythonwin
- R statistical package and Matlab software.

EXPERIENCE

Bachelor in Agronomy, Uruguay. Professional expertise in industry; operational planning using GIS and remote sensing. Professional experience in projects; GIS consultant at the national soil conservation project, Ministry of Livestock and Agriculture, Uruguay. Geographic Information Science Graduate Certificate, KSU.



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Damaris Hansel | PhD Student | Department of Agronomy | KSUCROPS Production Lab

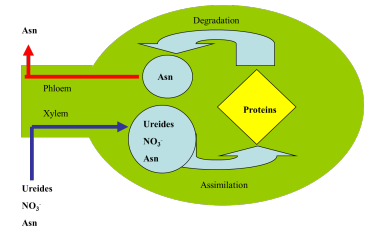
RESEARCH FOCUS

My research interests are in crop production with emphasis in soybean in alternative environments and sequence, for more sustainable practices that generate higher productivity. Also, study different managements that can increase profitability for farmers. One of the objectives of my studies is related to nitrogen fixation (ureides and ^{15}N), uptake and application in soybean. Another objective refers to double cropping soybean after wheat (PhD project). The project aims to find the yield gap in soybean and how the gap can be overcome utilizing ideal management for cultivating the crop after wheat harvest.



RESEARCH CAPABILITIES

- I am comfortable administering field, lab and people-involved projects. To be capable to reach good results in these projects I have developed the following skills:
 - **Leadership:** Lead small groups to work towards the same objective, valuing individual's abilities in favor of the goal.
 - **Organization:** Essential in all steps of any activity, before, during and after.
 - **Determination:** Start believing the end is going to be successful.
 - **Commitment:** The attitude of working hard towards expectations (own or other's).
 - **Group work and individual work:** Relate well while sharing responsibilities and opinions, and focus for individual assignments.
- Statistics: Manage of Sisvar Software
- Expertise in the crops: Soybean, irrigated rice and corn.



EXPERIENCE



During my bachelor degree in Agronomy I was part of a research group that studies lowland crops management, where I learned about irrigated rice, soybean and corn. In my master's degree I studied the effect of nitrogen application in different soybean stages among water excess. I had an opportunity to study abroad during my bachelor's degree, which opened the doors to later on engage as a PhD student.



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Ana Julia Azevedo | Graduate Research Assistant | Department of Agronomy | KSUCROPS Production Lab

RESEARCH FOCUS

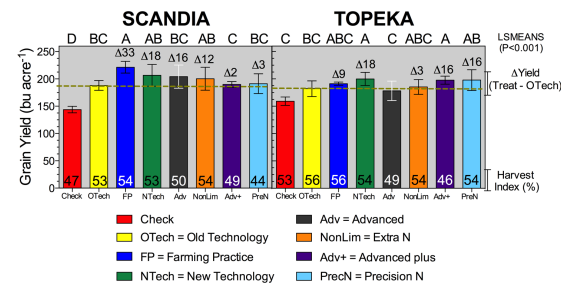
My research interests are in crop production, with emphasis in different managements and technologies in order to increase productivity for wheat and corn. The corn project have as overall goal quantify and understand the response of corn plants to application of nitrogen management approaches for maximizing yields and N use efficiency (NUE) from an agronomic, economic, and environmental standpoint. My wheat project have as a goal quantify the response of wheat plants to the planting technology for maximizing yields under diverse plant population and contrasting genotypes strategies.



RESEARCH CAPABILITIES

I am comfortable dealing with people, coordinating and organizing field and lab activities.

- Field work and coordination: experience in collecting and analyzing samples in different crops.
- Interpersonal skills: share activities according with each one capability, try to keep a good and friendly and professional environment.
- Persistency: once a have my goal I will work to make it happens.



EXPERIENCE



During my bachelor degree in Agronomy I participate in some research groups, working with soil physics, entomology and microbiology, doing my bachelor thesis about biological quality of soil. After my graduation I had the opportunity to work as a research scholar at OSU in the Precision Ag/Soil Science group, where I worked with wheat and corn. After this experience, I got to work as a Visiting Scientist at the KSUCrops Team and currently, as a graduate students working in projects including crop management and the use of new technologies.



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Osler Ortez | M. Sc. Student | Department of Agronomy | KSUCROPS Production Lab

RESEARCH FOCUS

My research is focused in better understanding the interaction between genotype, environment and management practices. I am currently working on my MS degree program, with the main goal on answering if soybean genotype x management interaction is impacted by the status of N in the system. Four site-years has been established: 3 site-years in Kansas (US) and 2 site-years in Oliveros (Argentina). A different number of historical and modern soybean genotypes are being tested at varying N fertilization strategies. To answer the proposed research question, improved knowledge on Biological Nitrogen Fixation (BNF) process is needed. This research will shed some light on the complex genotype x nutrient management interaction topic and also provide a historical perspective on changes in crop responses related to breeding advancement.

RESEARCH CAPABILITIES

I feel comfortable enough for conducting research, either in field- or lab-scales. I have a clear understanding on how to follow and reach goals and objectives, always making the proper use of resources. Some of the skills that I consider needed are listed below:

- Professional: keeping objectives well focused.
- Respectful: not just with co-workers, but with the entire environment.
- Organization: working on activities through steps, ensuring progress and results along the way.
- Commitment: giving always the best and a bit more whenever is possible.
- Punctual: being on time, keeping clear objectives and working toward them.
- Team work: being open to share and understand others ideas, supporting others.
- Communication: with the people involved.



I am on the learning process for analyzing Data. This process includes organizing and revising Data; investigating and performing statistical analyses, preparing graphs and finally writing scientific reports.



EXPERIENCE

The combination of experiences at home-Nicaragua (coffee production), Zamorano University-Honduras (2011-2014 BS) and Kansas State University (Visiting Scholar 2015) prepare myself for this challenge of pursuing graduate studies in agriculture with the primary goal of continuing my professional development and, at the same time, improving the understanding of critical topics such as global food security and biofortification in order to further advance agricultural systems in our world.



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Santiago Tamagno | PhD Student | Department of Agronomy | KSUCROPS Production Lab

RESEARCH FOCUS

Since the beginning of my career I have been focused on the description of physiological traits that are determinant for crop's grain yield. The processes for grain yield generation are highly affected by the environment in which plants grow, and management practices in the field. My research attends to characterize this complex interaction through the study of the accumulation and allocation of dry mass in reproductive organs (i.e., ears, pods), nutrient use efficiency and critical cultural practices such as stand density, fertilization and genotype selection.



Figure 1. Evaluation of different Nitrogen rates in corn in Argentina (2013)

My PhD focuses in Biological Nitrogen Fixation and Nitrogen dynamics in soybean and how this process is affected through different agricultural regions and practices in US. I understand the implications of my work as a mean to achieve sustainable food production through better resource use-efficiency and technical assessment to farmers and companies. Large exploitable gap exists between current yields and what is theoretically achievable under ideal management practices.

RESEARCH CAPABILITIES

As a member of my actual research team I am qualified to carry field experiments, collect data, design experiments and writing scientific articles. I am also trained in data management and statistical analysis with intentions to continue expanding my knowledge in this field.



I consider my research follows a valuable part, not only of my work but also my life. The exercise of leading a group of people, delegating responsibilities, and communicating scientific knowledge contributes to develop and increase my leadership and communication skills every day.

EXPERIENCE

I began to work as an undergraduate research assistant in field experiments in Argentina in 2010. During this period, I became familiar with the structure and dynamics of a research team. As an undergrad, I was offered to lead my own research project in corn related topics. I finished my MSc in Plant Breeding in March 2015 in the same group with two publications in international peer-review journals. I gave oral presentations and attended conferences and seminars. Before coming to US, I worked in the R&D Department in KWS Arg. Seeds, in maize. I am an actual member of the Crop Science Society of America. At the present, I am currently working as a Visiting Scholar and as a future PhD Student at Kansas State University.