



Brazilian Agronomy Student Learns About New York State Agriculture and Research with NMSP

By Lisa Fields

Diego Gris came to the United States for the first time in 2013 through Cornell University's College of Agriculture and Life Sciences Exchange student program. He is currently in his third year as an agronomy student at Brazil's Federal University of Paraná at the Palotina campus in southern Brazil. It's also Gris's home region, where corn, soybeans, hogs and poultry are raised on medium and large sized farms close to the city limits.

Gris described how he came to study in the U.S. "When I was 12, I started language school and learned to speak English during my six years there. That sparked my dream of visiting the U.S. My parents both work in agriculture and my grandparents are farmers. As a child, I spent almost every day with my grandparents, so I was always around farms. In my second year at University, I applied to the Brazilian Scientific Mobility Program. It was developed with the goal to send over 100,000 students all over the world. The idea is to go outside of our country to experience science and technology and bring back what we learned to apply to work and studies. I was very excited when I got accepted and learned I was coming to Cornell."

During his year at Cornell, Gris spent the summer of 2013 as an intern with the Nutrient Management Spear Program (NMSP) in the Department of Animal Science. Dr. Quirine Ketterings, Associate Professor and Director of the NMSP commented, "Diego was the third international student in the Agricultural Sciences major who joined us as a summer intern in the past several years. The interns get a chance to learn through hands-on experiences about New York agriculture, our on-farm research program, and our extension mission. Having a student like Diego in our team benefits all our team members. We don't have the means to go on international trips with our students and staff, but having students from outside the U.S. join our program brings a little international exposure to our team."

The research process wasn't completely new to Gris. He said, "I did some data collection and analysis for an irrigation research project at University in Palotina. I had learned research theory from lectures in Agricultural Experimentation class, but I didn't put it into practice until my internship with NMSP."



Diego Gris, agronomy student at Brazil's Federal University of Paraná at the Palotina campus in southern Brazil came to Cornell University for a one-year exchange program and used his summer in Ithaca to intern with the NMSP.

Gris's assignment was to compile data and write up the results of a study conducted by two high school students who interned with NMSP in the spring semester of 2012. The goal of the project, "Estimating Nitrogen (N) Content of Cover Crop's Above Ground Biomass in the Fall," was to develop a practical field procedure for farmers and advisors to estimate the amount of N in cover crops. Prior to Gris's involvement, plant samples were collected from 62 fields across New York planted with cereal rye, wheat, triticale and fall-seeded oats. Samples were gathered just before snow-fall and analyzed for carbon (C) and N content and total above (shoot) and below ground (root) biomass. Gris described his work. "To get me started, Quirine assigned me some reading on nutrient management and gave me the spreadsheets and writing the

students had completed. She explained what I needed to do with the data, and she and Shona Ort (NMSP technician) helped me interpret the data. Quirine looked at my work during the process to review it with me and give me guidance about the next steps."

For the written report, Gris graphed the correlation of above ground biomass in pounds per acre with total N content. His narrative described the strong correlation between above ground biomass and the quantity of N in the whole plant. He stated, "This pattern in the data enables us to estimate, based only on aboveground biomass, how much N a cover crop sequestered in the fall." Gris developed a step-by-step procedure using simple tools that arrives at the N and C content of the cover crop before winter dormancy. There's a chart with instructions on sampling typical areas of the field with a simple frame, how to clip and weigh the forage in the sample areas and the steps to determine the dry matter with a microwave oven. After getting the sample dry matter, a simple equation and a table of the typical C and N percentages for cereal rye, wheat, triticale and oats takes you to an estimate of N and C pools per acre. Gris noted the satisfaction of applying his technical skills with software to complete his assigned project. "During the data analysis, I had to look carefully for the source of some inconsistencies. I could point out some errors in the spreadsheets that corrected the problem, and then I split everything by cover crop and developed a bunch of graphics to assess the correctness of the predictions."

Ketterings added, "Diego did a great job, carefully reviewing the data, checking for consistencies, and analyzing for trends and relationships between biomass and N content. He wrote a report on the project that we hope to use in a factsheet for farmers and farm advisors. It will be a tool to help them determine the amount of N in their fall cover crops, and estimate possible N credits from the cover crops for the next year's corn."

Gris described some contrasts between Southern Brazilian and New York State

agriculture. "I had never seen so many dairy farms before and the climate is quite different. In Paraná there are two growing seasons, so corn is grown during the winter and soybeans in the summer on the same field. Field crops are much more challenging to grow here because of the cold climate."

The most enjoyable experience of Gris's internship was the time he spent travelling around the state with the NMSP team, setting up plots, soil and plant sampling and meeting farmers, crop advisors and Extension staff. He said, "The field activity that I enjoyed the most was collecting corn plant samples for the corn stalk nitrate test (CSNT). We had to walk through rows of very tall corn plants, and although we got several scratches and got really wet if it had just rained, it was a fun activity to do. Another really good learning experience for me was attending several field days during the summer. I really appreciate that Quirine gives the opportunity to all the NMSP staff to attend these events. They were very important for me to learn more about agriculture and to check out some of what is happening in field research in the state."

Gris will return to Brazil at the end of 2013, and is scheduled to graduate with an Agronomy degree from his University's five year program in 2016. He shared his thoughts about his future plans. "I very much enjoy crop science, but I also like working with software programs. I want to leave my options open and see what the opportunities are when I get closer to graduation. At this point, I can't be certain whether I'll continue on to graduate school or enter employment after I earn my degree. Coming to New York State to study at Cornell was a great opportunity for me. I think that when I return home, I will look at the agricultural practices from a whole new perspective."

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The **Nutrient Management Spear Program** (NMSP) is an applied research, teaching and extension program for field crop fertilizer and manure management on dairy and livestock farms. It is a collaboration among faculty, staff and students in the Department of Animal Science, Cornell Cooperative Extension, and PRO-DAIRY. Our vision is to assess current knowledge, identify research and educational needs, facilitate new research, technology and knowledge transfer, and aid in the on-farm implementation of strategies for field crop nutrient management including timely application of organic and inorganic nutrient sources to improve farm profitability while protecting the environment. An integrated network approach is used to address research, extension and teaching priorities in nutrient management in New York State. For more information on NMSP projects and extension/teaching activities, visit the program website (<http://nmsp.cals.cornell.edu>) or contact Quirine Ketterings at qmk2@cornell.edu or (607) 255-3061.