



An Open Mind and Thirst for Knowledge Guide 2016 Agricultural Sciences Honors Graduate Rachel Breslauer

By Lisa Fields

Advocating for food policy change was Rachel Breslauer's first agricultural endeavor. Four years later, she'll graduate with Honors in Agricultural Sciences from Cornell University.

"I grew up in suburban Hudson Valley, so I wasn't raised around agriculture," Breslauer said. "As a high school senior, I led my synagogue youth group's Food Justice Project. Our goal was to connect food stamps recipients with fresh, local produce. We met with local legislators and successfully lobbied to have food stamps accepted at area farmer's markets. Along with my interest in food policy, I wanted to study science and I chose to major in Biology at Cornell."

Breslauer spoke about questioning that choice as her coursework got underway in the fall of 2012. "Discussions with Kari Richards, Coordinator for the College of Agriculture and Life Sciences' Agricultural Science major, helped me decide how I wanted my interest in science to intersect with the world." She changed her major to Agricultural Sciences with Dr. Quirine Ketterings, leader of the Cornell Nutrient Management Spear Program (NMSP), as her academic advisor.

Breslauer set out to pursue diverse field experiences along with coursework that emphasized soil chemistry and plant growth. "To become an effective professional, I realized the need to gain the producers' perspective. The summer of 2013 I had my first hands-on experience working for Geyser Farms in direct market vegetable production and as a Farm to School program intern in Livingston, Montana," Breslauer explained.

In the fall of 2013, Breslauer joined the NMSP and got involved in research on the corn stalk nitrate test (CSNT), a post-season tool for nitrogen management. Ketterings said, "When Rachel approached me about becoming a summer intern with us in 2013 we had already filled those positions. But, I suggested she start working with us that fall, as she was very interested in learning about our program."

Breslauer explained, "That fall, I worked with post-doctoral researcher Pilar Berenguer on her project about spatial and temporal variability in CSNT results. I gained familiarity with nutrient management and the laboratory procedures of the research process. Although I arrived at NMSP feeling a bit lost with the transition in my major, Quirine helped me feel really comfortable."



Rachel Breslauer (right) receives the Outstanding Senior Award of the Northeast Region Crop, Soil and Agronomy Societies of America (NEBCSA) from Michael Fidanza (left, president of NEBCSA) in Philadelphia, PA, in January 2016.

In the summer of 2014, Breslauer interned in trait production development at Dow Agro-Science's Fowler, Indiana research facility. Breslauer interacted there with large-scale, multi-generation grain and soybean farmers. She noted, "After experiencing research geared toward international scale production as well as the contrast of direct marketing on a very local level, I gained an appreciation for the NMSP's work as a middle-ground that's relevant across a spectrum of farm sizes and methods."

This appreciation was enhanced during Breslauer's 2015 NMSP summer internship. "I enjoy being outdoors and I love fieldwork, so it was fun to do tons of soil sampling all over New York State. Talking with the program's post-

docs and all of the staff during those road trips was an amazing learning experience. It was such a great balance after being deep into data in the laboratory. Being in the field and meeting the farmers gave me a new perspective, and a much stronger connection to the projects."

That summer, Breslauer expanded on what she had learned in the laboratory the previous year. Ketterings said, "It was clear to us that Rachel could lead her own project. She had mentioned graduate school so I talked with her about the benefits of doing an Honor's Thesis, where she would be a project leader. She took the challenge and did a really outstanding job."

Breslauer explained her Honor's Thesis project, entitled Spatial Variability of the CSNT and Opportunities for Improved Sampling Strategies. "Our goal is to improve the utility of the CSNT test by developing better guidelines for field sampling than the current protocol of sampling 1 corn stalk per acre. Variations in soil types and environmental conditions within fields and management of that field such as pest and weed control, can cause low CSNTs even if N was not limiting. This can cause "false positive," or deceptively low CSNT results that suggest more N was needed while in reality N addition would not have increased yield. We sampled two fields with two years of yield data. Each field was divided into field zones identified as low, medium and high. In each yield zone, we did a comparison of yield and CSNT with and without additional N applied at side-dressing time. We saw that CSNT results can vary among yield zones and discovered that the ratio of Yield:CSNT might help identify potential false positives without the need to set up N trials. This project was a challenging and very satisfying learning experience."

In the fall of 2015, agricultural science major, Chutao Liu, joined the NMSP to gain some experience with laboratory work, just as Breslauer had done in the fall of 2013. Chutao, who had transferred from China as a junior at Cornell, worked with Breslauer. Ketterings commented, "When Chutao and Kari came to my office to talk about courses and future

career tracks, I realized it would be a great opportunity for Rachel to gain experience with being a research mentor, and for Chutao to learn from Rachel."

Breslauer said, "It has been awesome working with Chutao this past year. His focus on understanding everything we do at a deep level challenges my knowledge and encourages me to find effective ways to communicate about the project to my peers. I've enjoyed learning to strike a balance between being an effective mentor and progressing with the project."

Her academic performance, research and extension work resulted in Breslauer being recognized with the 2016 Outstanding Senior Award of the Northeast Region Crop, Soil and Agronomy Societies of America. Ketterings noted, "I nominated Rachel for the honor and was really happy that the societies recognized her with the award in January 2016. She is very deserving of the honor!"

After graduation, Breslauer said she'll work for Monsanto in Woodland, CA, on trait discovery in vegetable crops. "This is a super opportunity to apply and expand on what I learned in my plant breeding courses. Depending on how things go, I anticipate starting graduate school in 2017. I haven't set degree specifics, as that will depend on the projects and areas of emphasis in the school I attend."

Breslauer summarized the influence of her time with NMSP. "My interest in soil and nutrient management developed during my time with NMSP. The program reflects the heart of Extension, and I loved working in the context of outreach to a broader group. The focus is all about trying to improve people's livelihoods, no matter what they're growing or what their methods are. It's such a privilege to be part of that!"

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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.