



Chinese Pre-Vet Cornell Student Gains Research and Extension Experience with NMSP

By Lisa Fields

Yike (YEE-co) Bing knew since childhood that she wanted to be a veterinarian. An elephant ride in Thailand and a drive through a Kenyan preserve started her infatuation with wildlife. As a college student in Beijing, Bing's experiences ranged from work with giant pandas to assistance in spaying cats and dogs.

After attending 2 years of a 5-year veterinary medicine program she transferred to Cornell University in 2010 as an Animal Science major. Bing explained, "I had a dream to study in the US where I would have the opportunity to earn a DVM degree that is universally recognized. Unsure about my qualification, I questioned if I had the self-confidence to take on the challenge of vet school."

Bing successfully overcame her doubts and excelled in her coursework. She is slated to graduate in May with a BS in Animal Science with honors in research and has been accepted at Cornell's School of Veterinary Medicine for Fall 2012. She said, "I am so excited about this opportunity. A year ago I was unsure if I should even apply, as it's very competitive and tough to get accepted. I overcame my worries by focusing on what I could control; excelling in my studies and finding learning opportunities."

A key experience in building Bing's confidence was her work on soil fertility research with the Nutrient Management Spear Program (NMSP) in the Department of Animal Science during her second semester at Cornell. The project she undertook, "Potassium Soil Testing Methods" became her honors research thesis. Bing is currently in the final edit phase of her thesis and recently presented her findings to fellow students as part of the honor's thesis graduation requirements.

Bing discussed her experience. "I knew that a research opportunity would be helpful to my skills, no matter what career path I chose. I had no prior exposure to the subject area, so I viewed it as a chance to broaden my knowledge and gain hands-on lab experience."

Dr. Quirine Ketterings, Associate Professor and Director of NMSP commented, "Yike contacted me after one of her housemates mentioned that we offer interested students opportunities to get involved in research and extension. I really enjoy working with students like Yike. She was willing to step outside of her comfort zone, asked great questions, and her enthusiasm for learning was infectious."



Yike Bing, Animal Science major and pre-vet student, gained research and extension skills while working with the Nutrient Management Spear Program.

Bing explains, "The project objective was to assess correlations between the four commonly accepted extraction methods of determining soil potassium levels for crop fertility management. The methods used were the Cornell Morgan, the Modified Morgan, Mehlich-3, and Strontium Chloride extractions. We worked with 488 alfalfa field soil samples collected from 6 regions of New York State in both fall and spring so we could determine if time of year affected the results. I did a lot of background reading to gain an understanding of soil fertility and field crops here in New York State. I quickly got a sense of the relevance of my project, as alfalfa is a major field crop with a high potassium requirement, and potassium fertilizer can be a major expense for farms. The results of the comparison among the four

methods of testing soil potassium showed a strong correlation. That's good news, because that could imply that no matter the method used by the lab, for the soils in the study the potassium levels can be converted back to a Cornell Morgan test as the standard method."

Ketterings added, "Soil testing is done to determine the potassium needs of the crop. Some farm advisors are using a percent potassium saturation approach to derive recommendations while Cornell's guidelines use the Cornell Morgan soil test potassium and sufficiency approach. In our Cornell system, if the soil potassium level is such that a profitable yield response is not expected, potassium addition is not recommended. The basis of the potassium saturation ratio concept is to maintain a particular saturation ratio in the soil. This considers the amount of exchangeable potassium compared to the total amount of exchangeable cations. The critical percent potassium saturation then drives the fertilizer recommendations."

Bing found the two approaches were not directly comparable. She explained, "This means that potassium recommendations could be quite different depending on the concept applied to generate them. In my conclusion I noted that field trials applying the two concepts and comparing resultant yields are needed to help determine which approach gives the best results."

Ketterings added, "Yike worked with the soil samples that we collected the first year of the project. We just concluded the last sample analyses for the 2nd year of the project and results so far show the soil test potassium sufficiency approach to fertilizer recommendations to be superior to the saturation ratio approach. Final results will become available this summer."

In addition to compiling a formal research paper for her honors thesis project, Bing also produced a two-page factsheet about magnesium, one of the 18 essential plant nutrients. She commented, "The library research was the easy part. The challenge for

me was writing so the information connected with farmer's needs. Both science and extension writing were new for me. For the factsheet, it was the first time I had to consider the reader's viewpoint of what I was writing. The editorial input I received during draft revisions made these very important learning opportunities."

Reflecting on her future, Bing commented, "It was exciting to find the connections between this work and my veterinary career goal, because I didn't expect that at the outset. The background research about the technical facts and data interpretation is important to understand so you can communicate the findings in a way that's useful to farmers. This is much the same as researching a particular animal health issue and then communicating the essence of it in a relatable fashion to the animal's owner. Making that connection is why Extension is so valuable and I found that both exciting and enjoyable."

Working with the Stray Animal Care Association as a student in China and as a vet assistant here in the US helped Bing develop empathy and communication skills critical to working with people and their pets. "Helping people understand their pet's health issues and explaining the needed care isn't always easy, but it's a very satisfying and essential part of veterinary medicine."

Bing is excited to embark on the next step of her career aspiration. She noted, "I hope my veterinary education here can allow me to travel and experience veterinary work internationally, with the diverse settings that will provide. The skills I acquired while with the NMSP helped me get to this point and they'll also continue to be of great value as I pursue my future endeavors."

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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://nmisp.cals.cornell.edu>) or contact Quirine Ketterings at qmk2@cornell.edu or (607) 255-3061.