Seeds of Discovery

Seeds are fabulous fascinating aspects of flowers. There are no two alike, even among similar genera. They vary in size, shape, color, transportation method, germination method, and the list can go on. They are an important life source for plants, birds, insects, and mammals. With such an important element, why don't we know more about what the seeds of the Driftless Area look like?

I began a collection of seeds and was determined to figure out how to create images of them that would further the curiosity of folks and further our knowledge of these seeds. I had no idea how this would come about but I was willing to try many options. The camera would work with the larger seeds, at least for creating an image of what the naked eye would see. I bought a microscope and although I could see much of the intricacies of the seeds, I wasn't able to capture that in a quality photo. Dr. Dan Young, an entomologist at UW Madison, allowed me to use their Auto Montage equipment. This microscope creates various images at different planes, then merges these images together to create one clear, 3-dimensional image. Even this didn't create the detail I wanted. Talking with some friends who work in nano technology, they suggested a Scanning Electron Microscope (SEM) and said that UW allowed the general public to rent these. In my quest to find out how to make that happen, I was introduced to Dr. Yan Wu at UW-Platteville.

Dr. Wu and I exchanged numerous e-mails about the costs and how the SEM would work. Although their price was $10 per hour, which is very reasonable, I realized this project would require thousands and thousands of dollars. I had to pause with that reality. This was a dream but it was only a hobby, too! Dr. Wu came up with the perfect solution…apply to the Pioneer Academic Center for Community Engagement (PACCE) program to fund this and allow the Engineering students to do

the imaging as a learning experience. We wrote the grant together and it’s been in place for 2 semesters now. It’s been a great partnership!!!

On April 3, 2014, the college of Engineering, Math, and Science held their 43rd annual expo. This is where various aspects of the college are highlighted to middle school and high school students by using fun and creative methods. For example, the seed project was a demonstration of nano technology. A seed image was also used for the Science as Art contest where students took nanotech-related images to create art.

James Waldschmidt standing beside one of the posters created for the seed project.

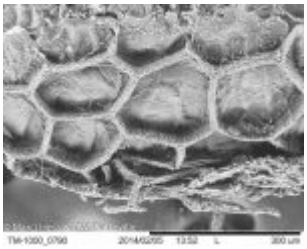
Paige Hagen thought a feature of Rattlesnake Master (Eryngium yuccifolium) looked like a rose. She colored this and entered it into the Science as Art contest.

Dr. Yan Wu talking to the students about the seeds and how they are imaged. Each container on the table has one of the seeds that are pictured on the posters.

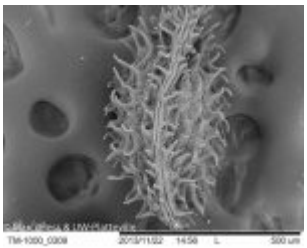
As we’ve moved through this project we realize there is much more to be discovered than we originally thought. The designs and patterns of these seeds have a story to tell. Why do some

seeds have elaborate structures and others do not? What purpose do these structures serve? Are there symbiotic relationships happening with these seeds and if so, how do those relationships benefit the seed? I hope these images will be a source of inspiration to someone; I hope they assist someone with their research into native plants; and I hope they provoke curiosity that will expand what we know about our native plants.

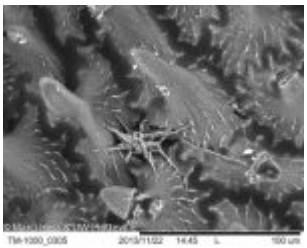
Agalinis aspera – Rough False Foxglove. This is magnified 100x its size. There are 450,000 of these seeds to an ounce.



Agalinis aspera – Rough False Foxglove. This is magnified 250x its size.



Heuchera richardsoni, Prairie alumroot. This is magnified 180x its size. There are 800,000 seeds to an ounce.



Heuchera richardsoni, Prairie alumroot. This is magnified 800x its size. I would love to know what that “feature” is on the seed!