

The purpose of this project is to create a common, unifying experiment, replicated at multiple Midwestern U.S. locations, testing the effects of planting the Three Sisters (maize, beans and squash) together versus individually on soil and plant health. **This project will engage Native citizen scientists and bring communities together in a network of experiments for a greater understanding of how the Three Sisters affects soil and plant health.** The Three Sister Project at ISU has two components, working with Native gardeners to grow Three or Four Sisters plots in their own communities and growing the Four Sisters at ISU (corn, beans, squash, and sunflowers). We worked with an advisory board made up of Native growers to guide our research, provide feedback, and form a collaborative network. We selected seeds from the USDA and Seed Savers Exchange to rematriate and donate the seeds produced back to Native communities. We also donate produce from our experiment.

Collaborators and Advisory Board

Nebraska Indian Community College (Omaha, Santee Sioux, Sioux City urban communities), Dream of Wild Health (Minneapolis/St. Paul Native communities, Natives people throughout Minnesota), Oneida nation of Wisconsin and the Menominee nation of Wisconsin.

Soil DIY Tests:

Soil Health Measurement	Purpose	Practice	Page in Manuel
Earthworm Abundance	Organic matter (OM) decomposers, increase aggregation, aeration and drainage	Counting earth worms in a determined area	5- 7
Soil Bulk Density	Impacts infiltration, root growth and plant nutrient availability Unit: grams of dry soil / volume in cm ³	Collect soil with PVC ring and weigh after drying	8-9
Decomposition	OM broken down via processes by soil organisms. Different management styles and practices effect OM decomposers.	Burying tea bags, cotton, birch sticks and finding difference of pre and post burying weights	10-14
Soil Slaking Test	Aggregate stability can help determine soil erosion potential	Submerging soils in bowl of water with a hand sieve	15-16
Water Holding Capacity (WHC)	Soil type and OM in soil effect ability of soil to retain and release water	Saturating fully dried soil with water with a funnel and quick calculations to find WHC	17-18

Resources: Soil Health Kit can be found in our website (QR code) and under the Learn tab!

Research Team: Dr. Christina Gish-Hill, Dr. Ajay Nair, Dr. Marshall McDaniel, and Dr. Donna Winham

Graduate Students: Derrick Kapayou, Emma Herrighty, and Valeria Cano Camacho



Scan for project website! Join our group on Facebook!

Three Sisters Gardening Project