USING SOLVITA SLAN TESTS IN AN UNDERGRADUATE BIOLOGY COURSE

I have been developing a theme-based introductory biology course focused on soil biology for our biology and biochemistry majors. My classes use a variety of analytical methods to assess the microbial populations in soil samples, and I particularly emphasize the utility of chemical methods in understanding biological systems. Given that this is an introductory course and only about half of the students have had general chemistry prior to this, the analytical methods I use need to be simple and robust. One of the assays that has been very useful in our labs is the Solvita SLAN assay. It provides me with the context for teaching acid-base chemistry as well as soil nitrogen cycling. Because the SLAN assay is very simple, the students are able to process many samples and make comparisons between soils. I have been asking students to bring soil samples from their home states giving us the opportunity to see first-hand that soils vary widely in their appearance and in their biological activity.

The last time I taught the course, we examined three different soils; a silty loam soil from Eastern Iowa, a granitic loam soil from Northern Minnesota, and a sandy soil from the Rockies of Colorado. The data objective was to simply assess the soils for the potential nitrogen released as a result of microbial activity, and we discussed the general appearance of the soils and the types of ecosystems that these specific soils supported. Because the soils were obtained from vastly different locations and ecosystems, it wasn't too surprising that we saw such differences in the total available nitrogen detected by the SLAN assay (Table 1).

Table 1. Nitrogen released from three different soils and detected using the SLAN assay								
	ppm SLA-Nitrogen (student samples)					Ave (ppm)	Std Dev	%CV
Iowa	337	293	317	345	329	309	322	19.1	6
Minnesota	190	154	163	186	198	210	183	21.3	12
Colorado	34	83	97	63	36		63	27.9	45

Using the SLAN assay in the lab allows us to collect a relatively large data set to make statistical comparisons possible. Furthermore, the simplicity of the assay lets us focus more on the biological activity of the soil rather than dealing with a more complicated chemical assay. This will allow me to introduce another soil assay related to nitrogen cycling and potentially use other assays enabling the students gain experience with correlative comparisons between labile amino nitrogen and other soil parameters.