



**CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY**

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| Name(s) Lindsay K. Dickerson | Project Number J0909 |
| Project Title The Dirt on How Microarthropods Make for Healthy Soil | |
| Objectives/Goals To discover if the population of microarthropods varies based on different environments, and whether a larger population of microarthropods has a positive effect on plant growth. | |
| Abstract Methods/Materials I conducted two phases of the experiment. PHASE 1: I collected soil samples from nine different environments and placed them in a homemade Berlese funnel, which used heat from a 40-watt light bulb to cause the microarthropods to migrate downward into alcohol. The microarthropods were then counted using a stereo-dissecting microscope. PHASE 2: Pea and radish plants were grown in organic farm soil with and without microarthropods -- using appropriate controls. | |
| Results * Surprisingly, the microarthropod count in the organic soil sample (69) was just 35% of the population of microarthropods in the conventional soil sample (189). * Development had a significant impact. The construction site soil had no microarthropods, and only one was found in the "high foot traffic" sample. Redwood soil taken 80 meters into the forest had more than 250% the population of a sample taken four meters off a paved road (61 vs. 23). * In Phase II of my project, more plants (10 vs. 8) and taller plants (8.16 cm vs. 7.59 cm on avg.) grew in pots with microarthropods than those without. Observations also revealed that plants in pots without microarthropods were less healthy (4 with leaf defects vs. 2). The soil without microarthropods also had a white fungus growing on the surface at week 3. | |
| Conclusions/Discussion The first phase of the project demonstrated how the microarthropod population varies from soil to soil, and how development drives microarthropods away. The second phase of the experiment proved how important microarthropods are to the health of the soil and the plants growing in it. | |
| Summary Statement My project was about discovering a below-ground community of life that contributes greatly to the health of our soil and plants, but is threatened by development and other human activities. | |
| Help Received Ian Teresi, farm manager, provided access to farmland; Ingrid Parker, Ph.D., University of California-Santa Cruz offered several ideas to explore; Francis Dickerson helped edit report. | |