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The extent to which greater net primary productivity (NPP) will be sustained as the atmospheric CO_2 concentration increases will depend, in part, on the long-term supply of N for, plant growth. Over a two-year period, we used common field and laboratory methods to quantify microbial N, gross N mineralization, microbial N immobilization, and specific microbial N immobilization in three free-air CO_2 enrichment experiments (Duke Forest, Oak Ridge, Rhinelander). In these experiments, elevated atmospheric CO_2 has increased the input of above- and belowground litter production, which fuels heterotrophic metabolism in soil. Nonetheless, we found no effect of atmospheric CO_2 concentration on any microbial N cycling pool or-process, indicating that greater litter production had not initially altered the microbial. supply of N for. plant growth. Thus, we have no evidence that-changes in plant litter production under elevated CO_2 Will initially slow soil N avail-ability and produce a negative feedback on NPR. Understanding the time scale over which greater plant production modifies microbial N demand lies at the heart of our ability to predict long-term changes in soil N availability and hence whether greater NPP will be sustained in a CO_2-enriched atmosphere.