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Solar park impacts on plant biomass and earthworm and nematode communities

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Solar parks are a rapidly expanding novel land use primarily to produce renewable energy. However, the aim is to make them multifunctional, and limit negative impacts on soils or even improve soil quality. Solar panels change the microclimate and cause shading below the panels, influencing plant growth and carbon and water inputs to the soil, with potential cascading effects on the soil biota. This research aimed to test the effect of solar panels on earthworm and nematode communities in 12 solar parks with contrasting designs across the Netherlands. Earthworm abundance and diversity, plant biomass and nematode abundance were measured between (gap) and below the solar panels. Nematode abundance was also measured at the highest and lowest edges of the panels. Plant biomass, nematode abundance and earthworm abundance were all significantly lower below the solar panels compared to in the gap between the panels. Nematode abundance at the highest and lowest edges showed intermediate numbers compared to the gap and below the panels. These results show that solar parks have a large impact on the soil biota and stress the need for guidelines for ecologically sound solar park designs to prevent soil damage.

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