"Solar Beneficial Insects": promoting beneficial arthropods in agrophotovoltaic systems

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In order to achieve climate protection targets set by the German Government, an enormous expansion of renewable energy will be necessary, including photovoltaic (PV) systems. To avoid a land-use conflict between agriculture and energy production, agrophotovoltaic (APV) systems could be increasingly used. In APV systems, the PV modules are either installed elevated above the crop itself or vertically next to the crop, so that the area below or in between the modules can still be used for agriculture. Currently, there is still a substantial knowledge gap regarding the compatibility of the dual agricultural and PV use. Especially, the potential impact on the functional biodiversity as an important guarantor for healthy crops is still unexplored in APV systems. Therefore, the aim of this research project is to determine how APV systems can be designed to support settlement and promotion of beneficial arthropods and hence reduce certain pests.

The project has started recording and evaluating current activities regarding APV systems in Germany, especially with respect to functional biodiversity. In cooperation with operators of APV systems the diversity and abundance of beneficial arthropods around existing APV systems, with a focus on hoverflies, sphecoid wasps (Hymenoptera: Apoidea) and spiders will be investigated. In order to promote beneficial insects, the project will also develop and field-test the performance of various elements that can be integrated in APV systems (e.g., flowering strips or nesting aids installed in the mounting framework). Additionally, the project aims to investigate whether the PV modules themselves have a direct influence on specific beneficial insects and pests, e.g., a repelling or attracting effect. Overall, the project aims at providing knowledge about how APV systems can be designed in an environmentally friendly way, generating additional benefit to agriculture through pest control and pollination.

„nützLINK" – a Citizen Science based approach to monitor beneficial arthropods in agricultural landscapes in Germany

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The global loss of biodiversity and in particular the decline of insects has serious consequences for many ecosystems worldwide. In agriculture, important ecosystem services such as crop pollination and natural pest control are at risk. Due to