

Internship: Flowering strips to support desert agriculture and biodiversity conservation

Center for Arid Socio-Ecology

Flowering strips consisting of wild flowers in agricultural areas have been proven to enhance crop pollination by wild pollinators like bees, wasps, butterflies and flies. They can also enhance bio-pest control provided by predatory or parasitoid insects as well as birds in agricultural settings by providing needed resources like nectar and pollen and habitat structures like roosting and hiding areas. A lot of research has been done in Europe about flowering strips but nearly nothing is known for arid areas. The southern Arava is located at one of the most arid areas in the world (hyperarid desert climate). Despite the challenges this harsh environment is used for intensive desert agriculture, producing crops like dates, melon, pumpkin, watermelon, onion and more. In winter the area experiences flash flood events which produce extensive plant growth in flooded areas a few weeks after the flood, which will peak in a bloom season of a couple of weeks. In previous research we found that these flowers are very attractive for several wild insects that may have the potential to pollinate crops and provide pest control services.

The internship will be part of a bigger research project about bio-pest control, wild pollination and how to enhance ecosystem services and agriculture and how to enhance agriculture for nature conservation.

The student will use a data set that was collected in 2019 and data/publications from previous research about pollinators in the desert. Based on this data they will create a useful flowering strip seed mix for the southern Arava agriculture that supports wild insects and their services, consists of local desert plant species and can be handled easily by farmers. The flowering plant combination must be useful for pollinators and other insect as habitat/food source and attract the right pollinators for crop pollination and specific natural enemies for bio-pest control enhancement. We aim at a win - win for farmers and nature. The following questions may be included in the approach A. Which flowers are attractive for what kind of pollinators? B. What would be the time of seeding and flooding to enable a spill over for crop pollination for the main crops in the southern Arava? C. Which seeds are already available in seed banks and which ones would need to be collected and produced? D. What are the expected impacts on the ecosystem and nature conservation aspects. E. Which ecosystem services (regulating and cultural) could be supported by flowering strips in the southern Arava agriculture?

The student would try the seeding and growing of a flowering strip/patch in the experimental farm of the southern Arava R&D and monitor the growth and flowering. The internship could be expanded to a second semester in which the student could then monitor the insects attracted to the flowering strip in spring. The final outcome of the project will be a seeding and monitoring

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protocol for farmers of the area to include flowering strips into their growing protocols and enhance pollination and bio-pest control.