control agents that may supplement current control measures. The research project "ParaDrosu" (2021-2024) aims at developing an innovative biological management strategy based on the release of these pupal parasitoids. Aspects investigated include successful mass rearing of parasitoids, which requires suitable hosts, the right climatic conditions and diets for the adults. Moreover, the rearing system must be efficient as well as economically viable. Within the project, parasitoid populations from different areas in Germany will be collected and tested for their performance with the aim to introduce these populations into the existing rearing stock to maintain parasitoid quality. Performance under different climatic conditions was tested and optimal storage conditions were defined. An appropriate parasitoid application technique ensuring both, optimal protection during transport and release and sufficient dispersal in the crop will be developed. Furthermore, the best release times, intervals and parasitoid numbers will be determined. Relevant plant protection products are tested for negative side effects on the parasitoids to define possible incompatibilities as well as suitable timing for integrated pest management strategies. Semi-field and field trials are conducted in Southern Germany to examine the parasitoids' efficiency in controlling *D. suzukii* in berry fruit cultivation. Results from the described research project should lead to defining mass production technology as well as develop detailed instructions for successful use to control *D. suzukii* in protected berry fruit cultivation under Middle European climatic conditions.

The project "ParaDrosu" – Biological Control of *Drosophila suzukii* by application of native pupal parasitoids – a closer look

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Drosophila suzukii Matsumura (Diptera: Drosophilidae) is an invasive pest of fruit and berries. The attack of undamaged ripening fruit is a major challenge for pest control and effective means of biological control to manage *D. suzukii* in Germany do not exist yet. In its native range, *D. suzukii* is attacked by different Hymenoptera, such as the cosmopolitan pupal parasitoids *Trichopria drosophilae* Perkins (Diapriidae) and *Pachycrepoideus vindemmiae* Rondani (Pteromalidae). European populations of both species can successfully parasitize *D. suzukii*. Prior to application of parasitoids on a commercial scale, a suitable application density

must be determined and specified for different types of crops and culture systems. Furthermore, the “area of activity” is of interest, i.e. whether a parasitoid is active near ground level or in the berry zone. To answer these questions with a focus on protected berry cultivation, a model trial was started on the experimental field of Julius Kühn-Institute in Dossenheim. Three raspberry plantings (plot size 20 m²) were netted with a standard net (mesh 0.8 cm); one additional planting was free-standing. All plantings were artificially infested with *D. suzukii*. Two netted plantings were subject to weekly releases of either five female *T. drosophilae* / m² or five *P. vindemmiae* / m²; the third plot and the free-standing planting served as controls. To determine parasititoid activity, raspberries were baited with fresh *D. suzukii* pupae and weekly exposed in the plantings for five days from August to mid-October. Afterwards, the pupae were removed and incubated. Of the 6,400 exposed pupae, 4,272 were retrieved in the laboratory, from which 3,435 insects eclosed (2,508 *D. suzukii*, 401 *T. drosophilae*, 526 *P. vindemmiae*). The maximum parasitation rate in a planting was 39.8 % for *T. drosophilae* and 45.4 % for *P. vindemmiae*. The latter was mostly detected in the upper berry zone (120-190 cm) and most active from mid-September until October, while *T. drososphilae* was mostly detected near ground level and did not show a temporal focus. Both species parasitized bait pupae in all four plantings. The first model trial in summer 2021 demonstrated that the method for quantifying parasitoid activity is suitable but showed the limitations of testing while using a standard net to separate different treatments. Further model trials in 2022 will focus on comparing the efficacy of the two species under modified testing conditions, such as a lower release rate. It will hopefully help to better understand the activity of released parasitoids in protected berry cultivation.

The project Antago-Senecio: Herbivorous insects for the control of tansy ragwort

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The rising number of tansy ragwort (*Jacobaea vulgaris* Gaertn.) in grassland, especially under low management intensity, is highly problematic for grazing livestock due to the poisonous impact of pyrrolizidine alkaloids in these plants. This phenomenon also exacerbates the use of those ragwort-rich grasslands for grazing or hay and silage production. Current management and control practices are time consuming or rely on herbicides which may be banned in future, why an innovative and self-regulating method is needed to secure the livelihood of farmers and the preservation of diverse and protected grasslands. Therefore, one aim of the EIP-Agri-Project “Antago-Senecio” is to find local and specialized herbivorous insects as potential biological control agents for the regulation of tansy ragwort. The