lance, integrated pest management and export quarantine measures of *D. suzukii* systematically.

Landscape effects on *Drosophila suzukii* dispersal and migration

Anto Raja Dominic[1], Felix Briem[2], Christoph Sinn[1], Doreen Gabriel[3], Burkhard Golla[1], Heidrun Vogt[2]
[1] Julius Kühn-Institut (JKI), Institute for Strategies and Technology Assessment, Kleinmachnow, Germany
[2] JKI, Institute for Plant Protection in Fruits Crops and Viticulture, Dossenheim, Germany
[3] JKI, Institute for Crop and Soil Science, Braunschweig, Germany

The presence and spatial distribution of various landscape elements play an important role in pest occurrence and damages. While high-resolution landscape data is widely available, sampling data are often not gathered with landscape studies in mind. In this presentation, we explore methods to analyze trap-capture data of *Drosphila suzukii* from south-west Germany with the objective of mapping spatio-temporal risk for their dispersal and migration based on landscape characteristics. We also present DROSOMON, a centralised, harmonized web platform for data gathering and easy access to trap-capture data and related parameters. The traps monitored by Julius Kühn-Institut over three years were all concentrated in three clusters, 75 km being the maximum distance between the traps. The trapping periods, baiting mixture and local environment vary between the traps. We study the correlations between the capture rates and landscape elements at local and landscape scales using buffer widths ranging from 10 m to 5000 m. In particular, we look into theorized hypothesis concerning *D. suzukii* captures to forested area, edge densities, residential areas and water bodies. The challenges in analyzing this dataset are the relatively homogeneous landscape distribution and the fact that trap captures probably do not reflect pest damage. With data from a wider region at German or European-scale, we expect to minimize the effects of these shortcomings.

Ecological adaptation of *Drosophila suzukii* in northern China

Jin-Ping Zhang[1], Feng Zhang[1], Ren-Ya Liao[1], Xiao Chen[2], Marc Kenis[3]
[1] MoA-CABI Joint Laboratory for Bio-safety, Institute of Plant Protection, Chinese Academy of Agricultural Sciences, Beijing 100193, China
[2] College of Plant Protection, Yunnan Agricultural University, Kunming, 650201 China
[3] CABI, Rue des Grillons 1, CH-2800 Delemont, Switzerland

Drosophila suzukii was first collected in 1935 in China and widely spread at least to 22 provinces. This pest was reported to damage berry, blueberry and bayberry. In order to understand the occurrence, distribution and damage of *D. suzukii* population in Beijing, we have carried out research on the ecology adaptability of this pest. The development of *D. suzukii* Beijing population was tested at different temperatures (15, 19, 23 and 25 °C) in the lab. Population dynamics were monitored by sugar-vinegar traps in orchard and forested semi-natural area near the city at five different elevations (from 300 to 1100 m) in Beijing from May 2014 to September 2015. Ovarian maturity and diapause stage of female *D. suzukii* were assessed by dissection. The cold resistance of *D. suzukii* adults was studied by measuring the supercooling point. The results showed that *D. suzukii* completely developed in the range of 15–25 °C by feeding on artificial diet and the best temperature was 23 °C. Population dynamics trends were similar among all monitoring sites and the population peak was observed from mid-July to early August. *D. suzukii* entered diapause stage from late September to next May. The flies enter reproductive stage one month after terminating diapause stage. The supercooling point of different day-old females was not significantly different, but there was a significant difference for different day-old males. The range of supercooling points of female and male adults was −17.27 °C to −18.89 °C and −17.59 °C to −21.09 °C respectively. These results provide a theoretical basis for forecasting and control of this pest.

SIMKEF – Development of a Desion Support System for *Drosophila suzukii*

Benno Kleinhenz[1], Marion Gradl[2], Uwe Harzer[2], Kirsten Köppler[3], Mandy Püffeld[3], Paolo Racca[1], Karl-Josef Schirra[2], Claudia Tebbe[1], Alicia Winkler[1], Jeanette Jung[1]
[1] Central Institute for Decision Support Systems in Crop Protection (ZEPP), Rüdesheimer Straße 60–68, 55545 Bad Kreuznach, Germany
[2] Agricultural Public Service Center Rheinpfalz, Breitenweg 71, 67435 Neustadt, Germany
[3] Center for Agricultural Technology Augustenberg (LTZ), Nesslerstr. 25, 76227 Karlsruhe, Germany

Within the project SIMKEF, a decision support system (DSS) which depicts the complex pathosystem host (fruit/grapevine) – *Drosophila suzukii* will be developed. The DSS is expected to predict the population dynamics of *D. suzukii* as well as the actual pest infestation risk for different berries, stone fruits and grapes. For this reason, the interaction of the entire life cycle of *D. suzukii* with the most important meteorological factors as well as the influence of the different host fruits on the biology and behavior is described or functionally determined. Laboratory tests, monitoring activities and already published data will be combined within the DSS. SIMKEF is divided into three different modules. Regarding the habitat, the potential infestation risk will be analysed in the first module. Orchards and vineyards nearby to forest or hedges could implicate a higher risik for an early occurrence of *D. suzukii* as isolated ones. In addition, in this first module a second factor is the temperature gradient during the winter period. Temperature has a significant influence on the survival and overwintering rate of adult flies. For the quantification of the initial population after winter period, laboratory experiments and monitoring data are analysed. As a result, the first module of the DSS identifies higher risk areas/habitats for fruit infestation and estimates the potential risik as an initial value in the DSS for the beginning of the season. In a second module of the DSS, phenological models describe the availability of host fruits. These ontogenetic models are based on the calculation of a daily growth rate of host plants depending on the daylight period and temperature. The summation of these growth rates will be correlated with monitoring data of growth stages of the different host fruits. In a third module depending on the current weather the population dynamics of *D. suzukii* will be calculated per host plant and over the fruit development period (from its beginning of attractive stage to its ripeness). Here, a multiplication factor per host plant passage and thus a risk factor for the infestation of the following host plant can be determined during growing season. The investigations on population dynamics as a function of temperature and relative humidity are carried out in laboratory trials. The provided output of SIMKEF should improve the timing of monitoring of fruit infestation and pest control of *D. suzukii*.

The results can be useful for both organic and conventional fruit and grapevine production and will be available at www.isip.de.

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The occurrence and management of *Drosophila suzukii* in Hubei Province, China

Yong-Cheng Dong[1], Nan Jiang[1], Chang-Dong Chen[2], Ping Li[3], Pu-Yun Yang[3], Chang-Ying Niu[1]
[1] Hubei Insect Resources Utilization and Sustainable Pest Management Key Laboratory, College of Plant Science and Technology, Huazhong Agricultural University, Wuhan, 430070, China
[2] Shiyan Station of Plant Protection and Quarantine, Shiyan, 442000, China
[3] Pest Control Division, National Agricultural Technology Extension and Service Center, Ministry of Agriculture, Beijing, 100125, China E-Mail: niuchangying88@163.com (CYN)

Spotted wing drosophila (*Drosophila suzukii* Matsumura) is an economically important pest damaging to soft skinned berries and stone fruits over the world. In the past years, the population remained relatively low in the main production areas of cherries in Hubei province, China. However there were still several cases of outbreak reported, yet the main cause is still elusive. We monitored the population dynamics using sugar/vinegar liquid traps in cherry orchards and analyzed the relationship of population dynamics with climatic factors. The population dynamics showed very similar tendency between early and middle varieties which have approximately two weeks delay of fruit maturation without exhibiting an obvious correlation with the fruit maturation. The overall dynamics showed two peaks throughout the experimental season, which coincided with the phenology of cherry and neighbouring strawberry, suggesting a potential shift across host plants. The correlation analysis indicated that temperature is the main factor positively affecting the mean number of captured flies whilst precipitation strongly negatively influenced them. The results suggest that the *D. suzukii* population fluctuation was significantly associated with host phenology and climate. Over past years, demonstration blocks were established nationwide under the support of the National Agro-Tech Extension and Service Centre. The various control strategies were integrated to fight against *D. suzukii* including (a) attracting and killing strategies – sugar/vinegar liquid together with sticky traps with different shapes and colors, (b) cultural control – habitats/orchards sanitation, deep plowing or rotary tillage, (c) recommended chemical spray in the case of outbreaks. In addition, strategic research such as gene mining and candidate selection targeting reproductive processes to facilitate SIT were carried out in the laboratory to support the pest control. Those inputs aim to provide the theoretical basis and develop effective and sustainable suppression approaches against *D. suzukii* in the long run.

Assessment of mortality factors for *Drosophila suzukii* in Switzerland

Tim Haye, Pierre Girod, Marc Kenis, Tessa Ramburn, Leslie Mann, Gaëlle Beureux, Oceane Liehrmann
CABI Switzerland, Rue des Grillons 1, 2800 Delémont, Switzerland

A life table study for *Drosophila suzukii* was conducted under semi-natural condition at a forest site in Delémont, Switzerland. The aim of the study was to examine mortality factors of all developmental stages, such as natural mortality, predation and parasitism. Fruits infested with eggs, L1/L2, and L3 were exposed over a short period of time using potted blueberry plants (*Vaccinium corymbosum*). Groups of pupae were exposed on the ground underneath the bushes. These were then collected for examination and rearing in the laboratory, to quantify mortality factors in the different developmental stages. For each exposure period, controls consisted of non-attacked fruits and fruits attacked by *D. suzukii* kept in screened cages. To estimate the generational mortality of *D. suzukii* in Switzerland, life tables were constructed using the data from the exposure experiments and following the methods described by Bellows et al. (1992). For the egg and L1/L2 stages, mortality was not much different if they were caged or not (respectively 36.05% and 31.25% for the egg stage and 60.64% and 62.43% for the L1 stage). For the L3's, exposed larvae were more attacked (76.12%) than the caged ones (63.75%). The same tendency was observed for pupae in the soil (25.63% for the non-caged and 18.67% for the caged ones). Based on these mortality rates, the total generational mortality was 95.57%, which provided a realistic R0 of 4.7. This mortality cannot be explained by parasitoids because none of them emerged from the larvae and pupae exposed. Mortality was only caused by two parameters here: predation or abiotic mortality. Mortality in the larval and pupal stage could be increased by introducing classical biological control agents from Asia, such as larval parasitoids in the genus *Ganaspis*, or using native pupal parasitoids (e.g. *Trichopria drosophilae*) for inundative biological control. To drop the population growth below 1 (= declining populations), 30% larval parasitism would be necessary (R0 = 0.92), whereas increasing pupal parasitism to 30% would had a much lower effect on the fly populations (R0 = 2.8).

Natural Enemies of *Drosophila suzukii* in Yunnan Province

Wu Hao, Fang Yuan, Chun Xiao, Chen Guohua
College of Plant Protection, Yunnan Agricultural University, Kunming 650201, PRC E-Mail: x.chun@163.com; chenghkm@126.com

Drosophila suzukii is one of the most important pests of many fruit crops. It has a wide variety of natural host plants. Current control measures for *D. suzukii* depend on pesticides to great extent. Biological control using parasitoids plays an important role in population regulation of *D. suzukii*. The objective of our study was investigating the parasitic natural enemy species of *D. suzukii* and studying their biological characteristics in Yunnan Province. More than 45 plant species were collected from 23 sampling sites in Yunnan province, among them there were 15 host plant species of *D. suzukii*. There were four parasitic wasp species in Yunnan province, namely *Ganaspis brasiliensis*, *Leptopilina japonica*, *Trichopria drosophilae*, and *Pachycrepoideus vindemmiae*, which emerged from five host plants. The species, populations and parasitism rates by the parasitic wasps varied with different sites and host plant species as well as with the same plant species at different sites. The highest rate of natural parasitism was 38.5 % in a *Myrica rubra* ochard. *G. brasiliensis* occurred in four generations in a year, the female population was higher than male (sex ratio ♀:♂= 2:1). This parasitoid parasitized 2nd larval instar of *D. suzukii*. Its average lifetime was about 49 days and the duration from egg to adult emergence was about 29 days. The peak period of oviposition was from the 7th to the 22nd day after emergence of females.