

## Population Model of the western corn rootworm

*Populationsmodell für den Maiswurzelbohrer*

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A web-based simulation model of the western corn rootworm was developed to plan the monitoring of the pest and to find optimum treatment dates. Based on comprehensive literature research and expert consultation within the joint German research project on *Diabrotica* all relevant impact factors with respect to the occurrence of western corn rootworm (reproduction, mortality and ontogeny) were identified and weighted. Interrelationships between these factors and the most important processes of population dynamics of the pest were quantified and combined to a deterministic simulation model. This model is part of the subproject "Simulation and Predictive Model".

The model was coded with the Java language and called "DiaSim". It allows to predict the first occurrence of the larvae stages (L1, L2, L3), the pupae stage and the hatch of the beetle depending on temperature and rainfall data.

Since spring 2011, the first version of the simulation model has been presented on the *Diabrotica* microsite of the Julius Kühn-Institut (<http://diabrotica.jki.bund.de>). The user gets predicted dates for a certain field through the use of simple GIS functions like map view, some navigation functions (zooming, moving) and site selection. Furthermore, the model offers a daily updated risk map of Germany's constituent states Bavaria and Baden-Württemberg and since 2012 of Hesse, Saarland, Rhineland-Palatinate and North Rhine-Westphalia, too. It is thus possible to estimate the development over the last seven days. The web-based model needs no installation, does not depend on any computer systems and may be used on mobile devices (like smartphones or a tablet pc).

For the further application of the model, a comprehensive monitoring is of enormous importance for the validating of the model. In case of higher population densities of the beetle a monitoring of larval stages would be desirable in order to identify and solve mistakes within the model. With the end of the project "DiaSim" will be handed over to ISIP (Information System on Integrated Plant Production) to be available on their website ([www.isip.de](http://www.isip.de)).

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