DAPHNE: a supporting tool for pesticides risk assessors and stakeholders

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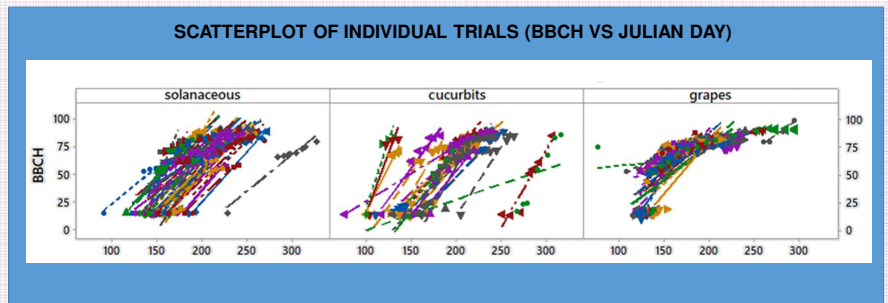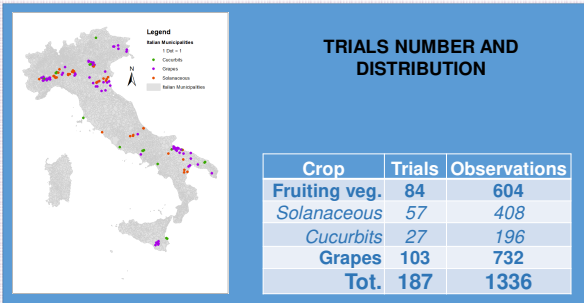**Key Words**: Ecotoxicology, Pesticide, Risk assessment, Surface water

What is DAPHNE?

DAPHNE (DAtes and PHeNological Estimation) is a tool allowing to correlate dates and crop phenological stages on a regional scale.

Why?

- To improve harmonisation in the application dates selection for fate modeling - To support the assessment of the geographical and temporal representativeness of higher tier effect studies - To provide information for a landscape approach to the ERA.

Highlights:

☐ Data from a number of efficacy trials were collected in a database that could realistically represent growing conditions of typical Italian crops.

TRIALS NUMBER AND DISTRIBUTION

Crop	Trials	Observations
Fruiting veg.	**84**	**604**
Solanaceous	*57*	*408*
Cucurbits	*27*	*196*
Grapes	**103**	**732**
Tot.	**187**	**1336**

SCATTERPLOT OF INDIVIDUAL TRIALS (BBCH VS JULIAN DAY)

☐ A set of explorative attempts to model BBCH to date curves was carried out. The dataset was elaborated in R (version 3.4.4 - package DRC). Different modeling functions were initially selected on the basis of visual matching: three and four parameters log-logistic function and the three parameters Weibull function were used. Different crop groups were analysed separately.

☐ Due to the independent nature of the trials considered, the combination of the mixed effect model and the spline approach is deemed more appropriate.

Results:
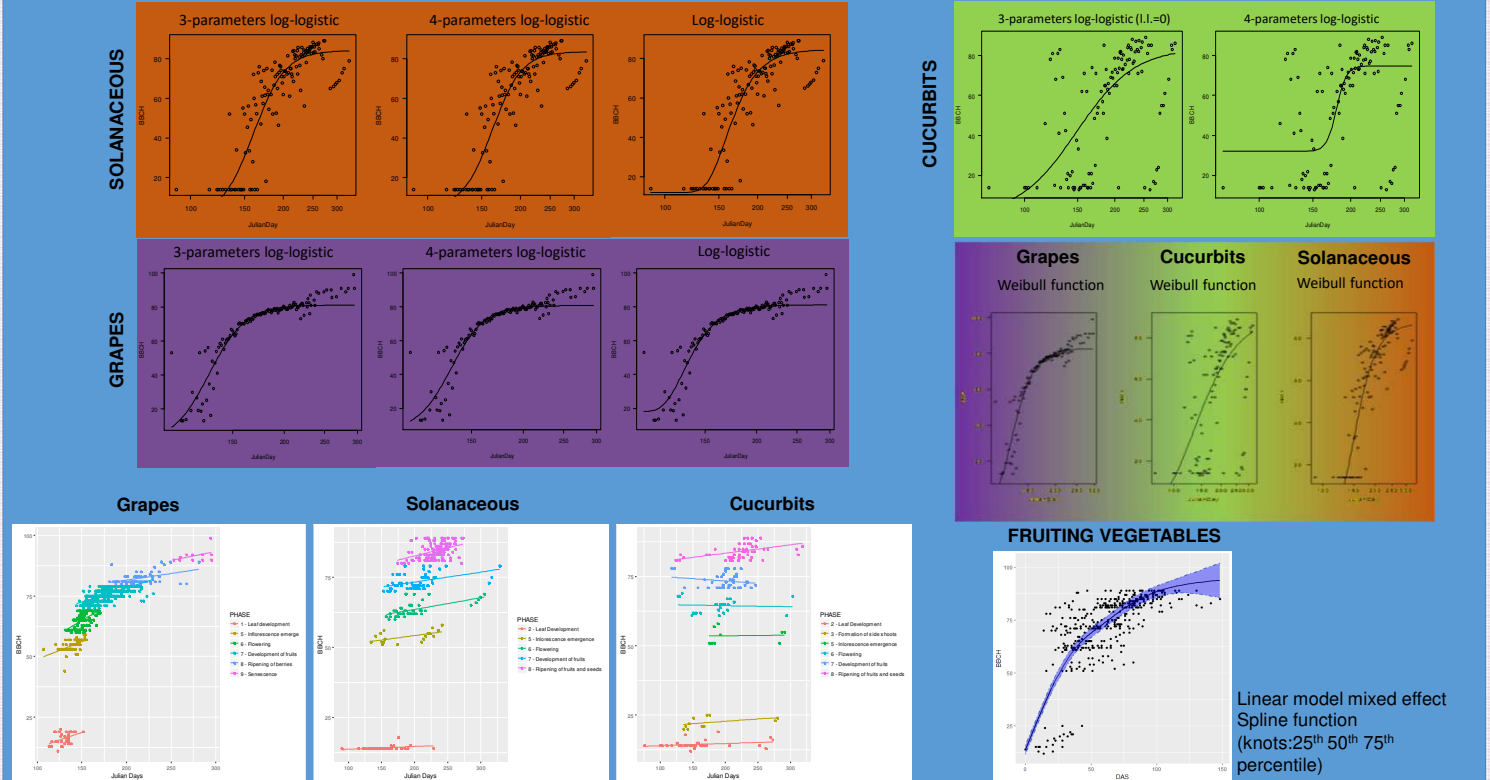
Preliminary considerations:

The tool is currently in its initial phase of development. We believe it has the potential to provide accurate realistic estimations of crop phenology on a regional scale and to provide a valuable support for the ERA of pesticides. The next step is to enrich our database in order to cover all major EU crops and to improve the geographical representativeness of our data for the Southern Zone and, ideally, for the whole EU.

References:
https://cran.r-project.org/web/packages/lme4/index.html
https://cran.r-project.org/web/packages/drc/index.html