Database of non-target invertebrates recorded in field experiments of genetically engineered Bt maize and corresponding non-Bt maize

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**Data file 2:** List and definitions of variables in the database. Presented are the variable names as in the first row of the database (data file 1), the definition of the variables, and the type of the variable. Closed terms indicate that predefined terms were used when entering the data (in contrast to free text). Missing values for numerical variables (integer, real) are labelled with NA in the database.

All data files are available on Dryad: <https://doi.org/10.5061/dryad.3j9kd51jq>

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This database was created for the following systematic review:

**Does the growing of Bt maize change abundance or ecological function of non-target animals compared to the growing of non-GM maize? A systematic review**

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| --- | --- | --- | --- |
| Variable name | Definition | Type | Closed terms |
| recordID | Unique identification number assigned to each record (row) of the database | integer | no |
| articleID | Unique identification number assigned to each article (publication) | integer | no |
| experimentID | Unique identification number assigned to each experiment (field trial conducted at one location in one year) | integer | no |
| author | Author(s) of the listed publication | string | no |
| publication\_year | Year of publication of study | integer | no |
| title | Title of publication | string | no |
| citation | Citation, e.g. journal name, volume and page numbers | string | no |
| link | Hyperlink to online publication, preferably doi (accessed 10 January 2022) | string | no |
| author\_affiliation | Type(s) of institutions that the author(s) are affiliated with (academic, government, private sector product developer, and combinations) | string | yes |
| author\_institute | Institutions and departments of all authors | string | no |
| peer\_reviewed | Indicates whether study was published in a peer reviewed journal (as specified on the journal’s homepage) (no, yes) | string | yes |
| study\_funding | Information on funding sources of the study (company, public, unknown, and combinations). Funding information as specified in the article, e.g. in the acknowledgement section. If no information was available, it was assumed that the main author’s institution provided funding. Public funding includes government, EU, and university grants. | string | yes |
| event | Name of the tested transgenic Bt maize event | string | yes |
| bt\_protein | Insecticidal Bt protein(s) produced by the Bt maize | string | yes |
| target | Insect order(s) targeted by the Bt protein(s) (Coleoptera, Lepidoptera, Coleoptera & Lepidoptera) | string | yes |
| bt\_hybrid | Bt maize hybrid or variety name | string | no |
| nonBt\_hybrid | Non-Bt maize hybrid or variety name | string | no |
| country | Country where field study was performed | string | yes |
| continent | Continent where field study was performed | string | yes |
| field\_location | Location of field(s) as provided by the author(s) | string | no |
| loc\_short | 4 characters to identify each location uniquely | string | no |
| longitude | GPS longitude coordinates of the field (WGS84 decimal format) | real | no |
| latitude | GPS latitude coordinates of the field (WGS84 decimal format) | real | no |
| field\_characterization | Information on site particularities including pressure of target pests, weed infestation, disease infestation, soil characteristics, rotation, field size, etc. | string | no |
| number\_of\_fields | Number of fields as described by the author(s) (usually 1 for plot designs) | integer | no |
| plot\_size | Size of replicated plots (in hectares) | real | no |
| is\_plot\_size\_avg | Indicates whether the listed plot size is averaged, estimated, or exact | string | yes |
| plot\_size\_explanation | Explanations for calculations done to obtain plot size (e.g. x by y meters) | string | no |
| exp\_design | Experimental design (e.g. alternating plots, field comparisons, randomized complete block design, split fields, …) | string | yes |
| years\_Bt | Number of years in which Bt maize was grown on the respective plots/fields before the experiment started | integer | no |
| planting\_date | Date on which maize seeds were planted (estimated if authors provided imprecise information) | date | no |
| planting\_year | Year of the experiment | integer | no |
| cultivation | Field management details (e.g. cultivation practices, tillage, herbicides, fungicides, irrigation, …) | string | no |
| comparison\_type | Indicates whether the comparison is u/u (untreated Bt vs. untreated non-Bt), u/i (untreated Bt vs. insecticide treated non-Bt), i/i (insecticide treated Bt vs. insecticide treated non-Bt), or i/i+i (Bt with insecticide 1 vs. non-Bt with insecticides 1+2) | string | yes |
| insecticide\_name | Brand name of applied insecticide, () if only active ingredient is known, or no insecticide | string | yes |
| insecticide\_ai | Active ingredient of applied insecticide | string | yes |
| insecticide\_class | Chemical class of applied insecticide | string | yes |
| insecticide\_app\_mech | Indicates if insecticide was applied as foliar spray, granular soil insecticide, seed treatment, soil treatment, combination, or not specified | string | yes |
| insecticide\_amount | Application rate of product or active ingredient per application | string | no |
| insecticide\_num\_app | Number of insecticide applications in the respective season | real | no |
| is\_num\_app\_avg | Indicates if the number of insecticide applications is averaged or exact | string | yes |
| insecticide\_dose | Indicates if full or half dose of insecticide was applied. If not specified by the author(s), full dose according to product label was assumed | string | yes |
| insecticide\_details | Additional information on insecticide applications, e.g. date or growth stage of application | string | no |
| sampling\_method | Sampling method applied to record invertebrate data in the field | string | yes |
| sampling\_method\_details | Detailed description of sampling method | string | no |
| first\_sample | Date on which first sample was taken | date | no |
| last\_sample | Date on which last sample was taken | date | no |
| sampling\_interval | Frequency how often samples were taken | string | yes |
| sample\_days | Number of samples taken over the season | real | no |
| subsamples | Number of subsamples per plot/field | real | no |
| sampling\_interval\_details | More detailed description of sampling dates or intervals | string | no |
| nontarget\_finest\_grouping | Finest level of taxonomic resolution reported for the non-target | string | yes |
| nontarget\_species | Non-target taxonomic species | string | yes |
| nontarget\_genus | Non-target taxonomic genus | string | yes |
| nontarget\_family | Non-target taxonomic family | string | yes |
| nontarget\_order | Non-target taxonomic order | string | yes |
| nontarget\_class | Non-target taxonomic class | string | yes |
| nontarget\_f\_group | Non-target functional group | string | yes |
| nontarget\_life\_stage | Non-target stage or sex | string | yes |
| more\_info\_from\_author | Indicates whether author provided additional details or data | YesNo | yes |
| data\_location | Figure number, table number or page number, where means and standard deviations were found. | string | no |
| data\_from\_figures | Indicates whether figures were scanned to obtain data using WebPlotDigitizer, Version 3.8-4.2 (<https://apps.automeris.io/wpd/>, accessed 6.1.2022) | YesNo | yes |
| response\_variable | Indicates if response variable reports abundance, activity density, parasitism rate, or predation rate | string | yes |
| mean\_unit | Unit of measurement for the response variable | string | yes |
| mean\_cumulative | Indicates if unit of measurement is per sample or cumulative over the field season | string | yes |
| info\_variation | Gives information on the availability of mean and SD or SE values and on the uncertainty of the given value (e.g. replicate-to-replicate data available, seasonal means with SD or SE available, means and SDs calculated from values of individual sampling dates, …) | string | yes |
| info\_N | Gives information on which N the mean and SD or SE provided by the authors is based (N confirmed or not confirmed, SD’s calculated based on true replicates or based on other units) | string | yes |
| SD\_details | Explains how we calculated the SD of the seasonal mean | string | no |
| selection\_means | Indicates if non-Bt (CMUE), Bt (EMUE), or both values were used multiple times in the database (e.g. if different Bt lines were compared to one non-Bt line or if plots treated with different insecticides were compared to one untreated plot with the Bt line) | string | yes |
| selection\_taxonomy | Indicates if the record represents a lower taxon (while the aggregated higher taxon is also in the database), a higher taxon (while several records of lower taxa are also in the database), or a unique entry  | string | yes |
| selection\_stages | Indicates if the life stage is an individual stage (while aggregated life stages are also in the database), an aggregated stage (while several records of individual stages are also in the database), or a unique entry | string | yes |
| NBt | True sample size (replicated fields or plots) for the Bt maize treatment | real | no |
| meanBt | Mean for the Bt maize treatment | real | no |
| SDBt | Standard deviation for the Bt maize treatment | real | no |
| SEBt | Standard error for the Bt maize treatment (not consistently provided) | real | no |
| NControl | True sample size (replicated fields or plots) for the non-Bt control treatment | real | no |
| meanControl | Mean for the non-Bt control treatment | real | no |
| SDControl | Standard deviation for the non-Bt control treatment | real | no |
| SEControl | Standard error for the non-Bt control treatment (not consistently provided) | real | no |
| remarks | Any additional remarks for this record | string | no |
| RC\_cultivars | Critical appraisal: Is the used non-Bt line the near-isoline to the Bt line? | string | yes |
| EX\_expression | Critical appraisal: Do the Bt plants express Bt protein in concentrations sufficient for controlling the target pests? | string | yes |
| FC\_clustering | Critical appraisal: Are Bt and non-Bt replicates (fields or plots) evenly dispersed in a homogenous landscape? | string | yes |
| RE\_replication | Critical appraisal: Does the study include a sufficient number of replicated plots or fields? | string | yes |
| HM\_field\_manag | Critical appraisal: Do Bt and non-Bt fields have a similar history of management before the start of the experiment? | string | yes |
| IB\_insecticide\_before | Critical appraisal: Did all fields remain free of insecticides and other uncommon interventions that might affect non-targets shortly before the sampling? | string | yes |
| PD\_pesticide\_during | Critical appraisal: Did the Bt plots/fields receive the same pesticide (herbicide, fungicide, etc.) treatments than the non-Bt plots/fields during the experiment? (This excludes the insecticide treatments that are part of the desired comparison of the experiment) | string | yes |
| ES\_equal\_sampling | Critical appraisal: Are non-target populations or functions (outcomes) measured in the same way for all treatments? | string | yes |
| MS\_method\_suit | Critical appraisal: Is the method commonly used for the sampled taxon and life stage? | string | yes |
| MT\_method\_timing | Critical appraisal: Is the sampling done at an appropriate time period? | string | yes |
| SD\_sampl\_dates | Critical appraisal: Is the sampling repeated over time? | string | yes |
| SP\_sampling\_process | Critical appraisal: Is the sampling procedure clearly described in a way that it could be easily repeated? | string | yes |
| SS\_sample\_size | Critical appraisal: Is the sample size equal for all treatments? | string | yes |
| VA\_variation | Critical appraisal: Do the authors report seasonal means and SD/SEs based on the number of true replicates? | string | yes |
| LN\_low\_numbers | Critical appraisal: Is the taxon collected in sufficient numbers to allow reliable comparisons? | string | yes |
| DP\_data\_plausibility | Critical appraisal: Are the reported means and variations plausible, trustworthy, and genuine? | string | yes |
| RE\_remarks | Critical appraisal: Additional text-remarks to explain and justify the decisions made for the individual critical appraisal criteria | string | no |