

## DATA SET DESCRIPTION

### *Phenological observations of crops from sowing to harvest (annual reporters, recent)*

#### Version recent

**Cite data set as:** DWD Climate Data Center (CDC): Phenological observations of crops from sowing to harvest (annual reporters, recent), Version recent, 2018.

#### INTENT OF THE DATASET

This describes the freely available data of the DWD Climate Data Center (CDC). The phenological data are quality controlled, flagged with a quality byte and partly corrected.

#### POINT OF CONTACT

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#### DATA DESCRIPTION

**Spatial coverage** Germany

**Temporal coverage** last year - current year

**Temporal resolution** annually

**Format(s)** Ascii. Each file PH\_Jahresmelder\* contains the observation of a certain species (e.g., oat), with fixed object\_id (e.g., 208). The rows are sorted according to Stations\_id, reference year, phase\_id. Each row corresponds to one observation. The list with all phenological stations and corresponding meta-data can be found here: [https://opendata.dwd.de/climate\\_environment/CDC/help/PH\\_Beschreibung\\_Phaenologie\\_Stationen\\_Jahresmelder.txt](https://opendata.dwd.de/climate_environment/CDC/help/PH_Beschreibung_Phaenologie_Stationen_Jahresmelder.txt).

**Parameters** meadows, winter wheat, winter rye, winter barley, winter oilseed rape, summer wheat, spring barley, oat, sunflower, maize, beet, sugar beet, fodder beet.

Qualitaetsniveau	see	Quality_flags
Stations_id	see	<a href="#">stations annual reporters</a>
Referenzjahr		year corresponding to phase
Objekt_id	see	<a href="#">phase definition</a>
Phase_id	see	<a href="#">phase definition</a>
Eintrittsdatum	date of observation	yyyymmdd
Eintrittsdatum_QB	see	Quality_flags
Jultag	date of observation	day of the year

**Uncertainties** Factors for uncertainties include: (1) change of observer (2) change of plants.

**Quality information** The Qualitaetsniveau describes the data control. The individual dates are flagged with a quality byte (Eintrittsdatum\_QB).  
Qualitaetsniveau:

1	only formal control
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	7	systematically controled and flagged but not corrected
	10	quality control and routine corrections finished (individual corrections later still possible)
Eintrittsdatum_QB	0	unchecked
	1	correct
	2	corrected
	3	ratified
	5	uncertain
	7	invalid date, e.g. 31. April, corrected automatically to 30. April
	8	incorrect
	10	meadows continuous green, anew beginning of turning green not detectable

## DATA ORIGIN

A fixed observation area is assigned to every phenological observer. Each observation area has a station-id assigned by the network administration. The observer registers the beginning of determined growth stages (pheno phases) and notes the date in the phenological observation journal, as soon as it occurred. Crops are observed from sowing to harvest on the same field. At the end of the year, the observer send the completed observation sheet to the network operator for data recording. In the long run, this system will be replaced by online data transmission (2015: 30 % of the observers).

## VALIDATION AND UNCERTAINTY ESTIMATE

During the operational handling of phenological data each year a gross error check and an additional spatial quality control has been performed. Each year 1 - 2 % of the data are flagged to be wrong. Causes could be confusion of months and phases.

## CONSIDERATIONS FOR APPLICATIONS

The current year data set is incomplete, naturally only online reported observations up to the current day are included, these stations are not spread evenly across Germany. In the current year, all data of beet are collected under the object-ID 25, see [https://opendata.dwd.de/climate\\_environment/CDC/observations\\_germany/phenology/annual\\_reporters/crops/recent/PH\\_Jahresmelder\\_Landwirtschaft\\_Kulturpflanze\\_Ruebe.txt](https://opendata.dwd.de/climate_environment/CDC/observations_germany/phenology/annual_reporters/crops/recent/PH_Jahresmelder_Landwirtschaft_Kulturpflanze_Ruebe.txt). After the end of the year, the object-ID of the actual beet variety replaces the object-ID 25, see [https://opendata.dwd.de/climate\\_environment/CDC/observations\\_germany/phenology/annual\\_reporters/crops/recent/PH\\_Jahresmelder\\_Landwirtschaft\\_Kulturpflanze\\_Ruebe\\_Spezifizierung.txt](https://opendata.dwd.de/climate_environment/CDC/observations_germany/phenology/annual_reporters/crops/recent/PH_Jahresmelder_Landwirtschaft_Kulturpflanze_Ruebe_Spezifizierung.txt). BBCH code see [phase definition](#).

## ADDITIONAL INFORMATION

English and Latin names of plants are listed in [https://opendata.dwd.de/climate\\_environment/CDC/observations\\_germany/help/PH\\_Beschreibung\\_Pflanze.txt](https://opendata.dwd.de/climate_environment/CDC/observations_germany/help/PH_Beschreibung_Pflanze.txt). For the English name of the phase see [https://opendata.dwd.de/climate\\_environment/CDC/observations\\_germany/help/PH\\_Beschreibung\\_Phase.txt](https://opendata.dwd.de/climate_environment/CDC/observations_germany/help/PH_Beschreibung_Phase.txt). According to experience, at some sites a few plant species are not, not continually or only partly observed. From 1991 (West Germany)/ 1992 (East Germany) a modified observation programme was introduce, see [https://opendata.dwd.de/climate\\_environment/CDC/observations\\_germany/help/PH\\_Beschreibung\\_Besonderheiten\\_Zeitreihen\\_Jahresmelder.txt](https://opendata.dwd.de/climate_environment/CDC/observations_germany/help/PH_Beschreibung_Besonderheiten_Zeitreihen_Jahresmelder.txt). When using phenological data, it is advisably to use several stations characteristically of a natural area or natural area group. In this way, the data have less gaps and the specifics of a single station are less prominently in influencing the results. The classification of natural areas and natural area groups used by Deutscher Wetterdienst (DWD) for phenological data is based on the map *Naturräumliche Gliederung und Waldverbreitung* (Meynen und Schmithüsen, 1953-1962), see also [https://de.wikipedia.org/wiki/Handbuch\\_der\\_naturr%C3%A4umlichen\\_Gliederung\\_Deutschlands](https://de.wikipedia.org/wiki/Handbuch_der_naturr%C3%A4umlichen_Gliederung_Deutschlands). Observation criteria for current pheno phases are defined in the [instructions for observers](#).

## REFERENCES

DWD, Anleitung für die phänologischen Beobachter des Deutschen Wetterdienstes, Vorschriften und Betriebsunterlagen Nr. 17, Deutscher Wetterdienst Offenbach 1991, überarbeitet 2014.

Kaspar, F., K. Zimmermann, and C. Polte-Rudolf: An overview of the phenological observation network and the phenological database of Germany's national meteorological service (Deutscher Wetterdienst). *Adv. Sci. Res.*, 11, 93-99, doi:10.5194/asr-11-93-2014, 2014.

Bruns, E., van Vliet, A.J.H.: Standardisation of phenological monitoring in Europe. Wageningen University, Deutscher Wetterdienst, 2003.

Emil Meynen, Josef Schmithüsen (Herausgeber): *Handbuch der naturräumlichen Gliederung Deutschlands*. Bundesanstalt für Landeskunde, Remagen/Bad Godesberg, 1953–1962.

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## **REVISION HISTORY**

The data are updated daily. This document is maintained by DWD National Climate Data Center (NKDZ), last edited on 19.12.2018.