



## **The phenological observation network and the phenological database of Germany's national meteorological service (Deutscher Wetterdienst)**

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Germany's national meteorological service (Deutscher Wetterdienst, DWD) maintains a dense phenological observation network. The beginning of characteristic vegetation stages ("phases") are observed and reported. These phases are closely connected to weather and climate.

Currently, approx. 1300 observers contribute to this network, the large majority of them on a voluntary basis. Approx. 160 phenological phases are observed and archived in the phenological data base of DWD. Two types of reporting strategies are applied: (a) 'yearly reporters' transmit their data once a year in a report sheet and (b) approx. 400 observers also submit their reports immediately after the occurrence of the phenological phase ('immediate reporters').

The observation program of the phenological yearly reporters contains widely distributed wild plants, forest trees and ornamental shrubs, the most important agricultural crops, as well as frequently grown fruit plants and grape vines.

Until 1991, data collection in the two German Republics had been carried out according to programs which agreed in large parts, but with the exception that partly not all phases were put to the archives in East Germany. In the meantime, however, it has been started retrospectively to put these data to the archive, too. After the German reunification, a new observation program with detailed observation instructions was put in place in 1992 and has been used since then.

The reports have been archived since 1951. They are a component of the national climate data base of DWD. 474 of the stations in the database cover a period of 50 years (or more), 164 stations cover a period of 60 years (within the period 1951-2010). However, not all phases have been observed over that interval. It was possible to expand the database to the time before 1951 based on historical documents. For the location Geisenheim these observations are available back to 1896.

The data are freely available (via the website of DWD; e.g. [www.dwd.de/phaenologie](http://www.dwd.de/phaenologie)) and are also provided to the PEP-database (Pan European Phenology; [www.pep725.eu](http://www.pep725.eu); hosted at ZAMG) and to the plant-phenological online database ([www.ppodb.de](http://www.ppodb.de)). The PPODB also contains phenological data from additional sources and supplements the DWD-data especially for periods prior to 1951.

The data have been used in many research activities, but are also used within DWD's agricultural advisory program and DWD's pollen information service.