

Julian Nick Bauer

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Education

Doctoral candidate

University of Bonn, Germany

Horticultural Sciences Group, under the supervision of Prof. Luedeling

Oct 2025 – present

- **Thesis topic:** *Modeling fruit tree phenology: Exploring climate change adaptation pathways with emphasis on extrapolative model validity*

Research stay – Integrating DBA in phenology models

Pontificia Universidad Católica de Valparaíso, Chile

Laboratorio de Dormancia y Fenología Frutal; supervised by Prof. Fernández

Jan 2025 – May 2025

- Developed methods to integrate the effects of dormancy-breaking agents (DBA), growth regulators used to induce bloom in temperate fruit trees under suboptimal conditions, into phenology models

M.Sc. Crop Science (Focus: Digital Agriculture)

University of Bonn, Germany

Oct 2021 – Sep 2024

- **Final Grade:** 1.1

- **Thesis:** *Phenology prediction under climate change – Mapping validity domains for Japanese cherry blossom models.*

Research semester – Cherry bloom phenology modeling

Kyoto University, Japan

Lab of Prof. Tao; supervised by Prof. Yamane

Oct 2023 – Apr 2024

- Trained machine learning and process-based models to predict bloom dates of Japanese cherry trees for diverse conditions along the latitudinal temperature gradient

B.Sc. Agricultural Sciences (Focus: Crop Science)

University of Bonn, Germany

Oct 2017 – Sep 2021

Work Experience

Principal Engineer – PhenoDecisions GmbH

Bonn, Germany · *Aug 2025 – present*

- Designed and automated data processing and model calibration pipelines in R for phenological and climatic analysis, supporting predictive research in fruit and nut tree systems
- Engineered and implemented the company's website platform, integrating dynamic content and responsive design
- Built PhenoMon, an end-to-end Android phenotyping platform with a FastAPI backend for structured field data collection, image capture and phenological annotation for research and industry applications
- Developed the end-to-end computer vision pipeline, including dataset preparation, annotation workflows and YOLO-based model training to enable automated phenological stage analysis

Consultant / Intern – CIFOR-ICRAF

Bonn, Germany · *Sep 2024 – Dec 2024*

- Reviewed and synthesized literature on European family farm structures and succession pathways
- Compiled and analyzed bibliometric datasets, including network analysis of research fields
- Extracted, analyzed and visualized data regarding family farms from FADN and EUROSTAT
- Compared organic and conventional farming system with an applied decision analysis to model farm trajectories and decision-making contexts

Data Analyst Intern – Xarvio BASF Digital Farming GmbH

Cologne, Germany · *May 2024 – Jul 2024*

- Processed and condensed complex, multi-source agronomic and geospatial datasets, including satellite-based remote sensing data and soil-level measurements, into interpretable analytical outputs
- Visualized and analyzed data to identify relationships, trends and spatial patterns
- Implemented algorithms to support the development of analytical models
- Harmonized heterogeneous datasets across spatial scales, integrating field and satellite-derived information
- Worked primarily in R and Python; applied QGIS for advanced geospatial analysis and management of raster (e.g. GeoTIFF), vector (e.g. Shapefile, GeoJSON), metadata (XML) and data exchange (JSON) formats

Student assistant – University of Bonn (Crop Science Group / IGG)

Bonn, Germany · *Oct 2022 – Dec 2022*

- Contributed to a computer vision project by labeling data and adjusting the YOLO-based detection pipeline (Python & PyTorch)

Intern – AOC-Farm

Malindi, Kenya · Jan 2020 – Mar 2020

- Conducted temperature monitoring and analysis inside and outside greenhouse environment
- Supported delivery of ICT lessons and training sessions
- Contributed to waste-management workshops and farm process improvement activities

Harvest helper – Lake Ladoga Farm

Kimba, Australia · Oct 2019 – Nov 2019

- Assisted with harvest operations and machinery maintenance on a 4,000 ha arable farm.

Trainings

- University of Bonn – *Certificate of Intercultural Competence*
- University of Bonn & Ghana – *Joint Skills Enhancement Program for Master Students*
- Coursera – *Supervised Machine Learning: Regression and Classification*

Scholarships & Awards

- **International Society for Horticultural Science (ISHS)** · *Young Minds Award for Best Poster Presentation* (2025)
- **German Academic Exchange Service (DAAD)** · *Research Scholarship for Doctoral Candidates* (2025)
- **Theodor Brinkmann Foundation** · *Spring Master Scholarship for Best Master Thesis* (2024)
- **Japanese Student Services Organization (JASSO)** · *Exchange Scholarship* (2023)

Publications

J. N. Bauer, Valentina Jüngert, Anja Gassner, Dave Harris, Kai Mausch. How are Europe's small and family farmers doing? A literature review of economic and social factors. *Outlook on Agriculture*. (accepted)

J. N. Bauer, L. Caspersen, E. Luedeling, H. Yamane. Rethinking model transferability: Validity domains as a new approach to delineate the limits of bloom date projections. *Global Change Biology*. (accepted)

J. N. Bauer, L. Caspersen, E. Luedeling, H. Yamane (2025). Modeling Japan's Yoshino cherry blooming with the PhenoFlex framework. *V International Symposium on Woody Ornamentals of the Temperate Zone 1434*, 83-90. doi: 10.17660/ActaHortic.2025.1434.12

Conference Contributions

J.N. Bauer, L. Caspersen, E. Luedeling, E. Fernandez

Integrating dormancy-breaking agents into cherry blossom modelling: preliminary insights from using the PhenoFlex framework. *10th International Cherry Symposium, June 2025, Richland, USA.*

J.N. Bauer, L. Caspersen, E. Luedeling, H. Yamane

Modeling Yoshino cherry flowering phenology with the PhenoFlex framework. *5th International Symposium on Woody Ornamentals of the Temperate Zone, April 2024, Matsue, Japan.*

P. Nachtweide, **J.N. Bauer**, J. Kierdorf, L. Chong, R. Roscher, T.F. Döring, A. Hamm, S.J. Seidel

Classical and image-based pollinator identification and quantification in agroecosystems. *Fachforum Bienen und Landwirtschaft – Strategiekonferenz, Jan 2024, Berlin, Germany.*

P. Nachtweide, **J.N. Bauer**, J. Kierdorf, L. Chong, R. Roscher, R. Bayati, F. Kurth, T.F. Döring, A. Hamm, S.J. Seidel

Classical, audio-, image- and video-based pollinator identification and quantification to evaluate biodiversity in agroecosystems. *64th Conference of the Society for Crop Science (Gesellschaft für Pflanzenbauwissenschaften e.V.), Oct 2023, Göttingen, Germany.*