



Crop Modelling for Agriculture and Food Security under Global Change

February 2-4, 2026

Palazzo degli Affari
Florence, Italy



icropm2026.org



ENDORSEMENT



UNIVERSITÀ
DEGLI STUDI
FIRENZE
DAGRI
DIPARTIMENTO DI SCIENZE
E TECNOLOGIE AGRARIE,
ALIMENTARI, AMBIENTALI E FORESTALI

Start time	End time	Monday 2 February		
08:30	09:00	Registration open		
09:00	09:30	Institutional Welcome and Opening		
		Plenary Keynotes		
09:30	10:00	Cynthia Rosenzweig – Why We Model: Scientific Advances, “What If” Questions, and Aids for Decision Making		
10:00	10:30	Joachim von Braun – Food Systems Transformation Needs – Challenges for Policy and Opportunities for Modelling Systems, Crops, and Food Security		
10:30	11:10	Break		
		Advances in Models Chair: Gerrit Hoogenboom	Sustainability & ESS Chairs: Martin Volk; Marc Corbeels	Decision Making & Innovation Chair: To be defined
		Spotlight Presentation	Spotlight Presentation	Spotlight Presentation
11:00	11:34	Scott Chapman – Integrating crop models with deep learning: from synthetic datasets to tunable algorithms	Luis Junghanns – Global hotspots of future cropland expansion vs. intensification and impacts on biodiversity	Meijian Yang – Machine Learning-Enhanced Crop Modeling with Multidimensional Data Assimilation for Agricultural Decision Support
11:34	11:46	Yvonne Stickler – Integrating Process-Based and Data-Driven Models for Wheat Yield Prediction Under Variable Meteorological Conditions	Iris Vogeler – From Long-Term Experiments to Models: Evaluating Set-Aside as a Strategy to Reduce N Leaching in Intensive Cropping Systems	Pepijn A.J. van Oort – A potato digital twin for decision support
11:46	11:58	Ioannis Athanasiadis – From theory to gradients: crop growth models for the AI era	Mara Gabbrielli – Process-based regional assessment of nitrogen dynamics in arable farms under increasing organic fertilisation	Vijaya Joshi – Leveraging GenAI for crop simulation model applications
11:58	12:10	Enli Wang – Integrating molecular and physiological models improves genotype-phenotype prediction of wheat flowering time	Antoine Couède – Assessing the performance of DayCent and STICS in simulating soil carbon and maize yield responses to contrasting organic resources in sub-Saharan Africa	Malte von Bloh – Growing Smarter: Hybrid Models for Crop Yield Prediction
12:10	12:22	Pierre Martre – Enhancing predictions through model component exchange: A case study on soil temperature models using Crop2ML	Cyrille Midingoyi – A credible crop model ensemble to simulate maize response to intensification and climate variability in sub-Saharan Africa	Andreas Tewes – Near-daily 10-m LAI maps for farmers by combining crop growth model simulations and Planet’s Biomass Proxy remote sensing product
12:22	12:34	Teiki Raihauthi – LLM-assisted workflow for crop model components generation towards interoperable agricultural platforms	Magdalena Schwartzkopff – Increasing grass-clover ley duration and proportion in dairy crop rotations increases SOC but also increases N leaching	Offer Rozenstein – Bridging the Gap: Integrating Remote Sensing Data with a Coupled Crop-Radiative Transfer Model for Improved Agricultural Decision Support
12:34	12:46	Benjamin Dumont – Does model formalization impact its ability to simulate high yielding situations : Lessons learned from a multi-model ensemble	Marijn van der Velde – New European datasets on agricultural land use and farming practices from Earth Observation, survey, administrative sources, and model applications	Lucas Nicolas Vitantonio-Mazzini – Real-time crop modelling APIs for optimizing agricultural decisions

Session: Scientific and Methodological Advances in Crop Modelling

Session: Climate Change – Impacts, Adaptation, Mitigation

Session: Sustainability, Ecosystem Services, and Biodiversity

Session: Food Systems and Food Security

Session: Decision making and innovation support

Plenary Sessions

Poster Sessions

Institutional Sessions



12:46	12:58	3-5 Poster Pitches (2-3 min each, 1 slide): to be defined	Shi Yuning - Developing 2-D and 3-D variants of the Cycles agroecosystem model for farm practice optimization and landscape design	Poster Pitches Kallenberg M - interoperable reinforcement learning-augmented crop-model digital twins for field decisions: spraying and fertilization (To be confirmed) Kern J. - Frequent flyer: UAV-based crop model calibration Rinaldi M. - Development of Easy Simulator Crop Model (EaSiCroM) for irrigation management in water scarce environments Berger A. - Using the critical nitrogen uptake curve to drive nitrogen demand within an in-season decision support system for wheat Taulemesse F. - Integral nitrogen fertilization management of bread wheat in France with FERTI-ADAPT CHN
13:00	14:30	Break		
14:30	15:30	Poster session 1 (Theme Sessions 1 & 5)		
		Advances in Models Chair: Enli Wang	Food Systems Chair: To be defined	Advances in Models Chair: To be defined
15:30	15:42	Henrike Mielenz - The AgMIP calibration protocol	Seyyedmajid Alimaghham - Rebalancing macronutrient supply in sub-Saharan Africa: Climate-smart optimization of cereal-legume systems	Claas Nendel - Combining process-based modelling and remote sensing to quantify state-scale groundwater extraction for irrigation in Brandenburg, Germany
15:42	15:54	Samuel Buis - Advances in Crop-timizR and CroPlotR R packages for crop model parameter estimation and evaluation	Mkuhlani Siyabusa - Quantifying and analyzing planting date gaps in Sub-Saharan African maize systems: a hybrid approach	Maximilian Zachow - Integrating forecasted weather conditions into data-driven models for wheat yield forecasts before harvest
15:54	16:06	Daniel Pasquel - On the interest of using high-throughput field phenotyping and satellite data for crop model calibration	Marloes P. van Loon - Sustainable intensification of grain legume production in sub-Saharan Africa and the impact of climate change	Nathalie Colbach - FLORSYS: a mechanistic model bridging scientists, advisors and farmers for designing agroecological weed management
16:06	16:18	Irina Heiss - Improving phenology and yield predictions in APSIMx using exclusively public data: a reproducible calibration workflow	Lioba Martin - Capturing yield failure due to heat vs. drought in Germany	Alex Ruane - A Virtual Agricultural Innovations Laboratory (AVAIL) - Crop Model Data Assimilation and Machine Learning for Innovations in Iowa
16:18	16:30	Delhez Laura - Revealing carbon-water trade-offs in Daisy crop model using Pareto-based calibration	3-5 Poster Pitches (2-3 min each, 1 slide): to be defined	Meshach Ojo Aderere - MLDNDC: A machine learning-based surrogate model for the optimisation of cropping systems in Denmark
16:30	17:00	Break		
		Advances in Models Chair: To be defined	Climate Change Chair: To be defined	Decision Making & Innovation Chair: To be defined
17:00	17:12	Alessandro Triacca - A Process-Based Framework for Simulating Cereal-Grain Legume Intercropping Systems	Henrik Eckersten - What did climate-change scenarios of Swedish agricultural crop production predict for 2000 onward, and what actually happened?	Krishnagopal Halder - Forecasting End-of-Season Winter Wheat Yields Across Germany Using an Enhanced Temporal Fusion Transformer

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17:12	17:24	Júlia Rasera - Modeling perennial fruit trees with DSSAT-CSM: integration and evaluation of TREGRO	Lisma Safitri - Assessing Climate-Smartness of Agronomic Practices in Oil Palm Production Under Climate Change	Michal Antala - Remote Sensing Meets Crop Models: Improving Potato Yield Simulations under Diverse Management
17:24	17:36	Niloofar Shahidi - Modelling kiwifruit (<i>Actinidia deliciosa</i>) phenology and fruit growth with APSIM (To be confirmed)	Mathieu Delandmeter - Potential of crop diversification and integrated crop-livestock systems for climate change adaptation and mitigation	Amal Chakhar - Drought stress monitoring for climate resilience: maize monocrop vs. intercrop in western Kenya
17:36	17:48	Vittoria Viglione - The quest for balance between accuracy and robustness in crop model-aided genomic prediction	Alessia Perego - Restoring Farming Systems: SOC and N ₂ O driven by practices and crops	Siddharth Singh - Integrated Soil-Weather-Irrigation Fusion System for Adaptive Alternate Wetting and Drying in Rice Cultivation under Climate Variability (To be confirmed)
17:48	18:00	Andrianasolo Fety Nambinina - Operational parameterization of 800 soft wheat varieties: reconciling decision support with unequal levels of knowledge	Nadia Testani - Integrating stakeholder knowledge and crop modeling to assess climate adaptation options in Northern European agriculture	Jamina Gabrielle Bondad - Process-Based Detection of Drought Stress at Scale: Insights from Silage Maize and Winter Wheat Dynamics in Germany
18:00		End of the Day		

Start time	End time	Monday 2 February		
		Plenary Keynotes		
09:00	09:30	Lily-belle Sweet - Pathways towards trustworthy, transparent and transferable machine learning for agricultural modelling		
09:10	10:00	Bing Liu - Integrative adaptation strategies for stabilizing wheat productivity with climate warming in China		
10:00	10:30	Christopher Topping - Functional Biodiversity Modelling for Agricultural Systems: Lessons from Environmental Risk Assessment		
10:30	11:10	Break		
		Advances in Models Chair: Taru Palosuo	Climate Change Chair: To be defined	Sustainability & ESS Chair: Jørgen Eivind Olesen; Martin Volk
11:10	11:22	Kenneth Boote - Adapting the CROPGRO Model for Winter and Spring Field Peas	Spotlight Presentation	Ahmad Manschadi - Simulating competition, facilitation, and yield dynamics in cereal-legume intercrops – The SSM-InterCrop model
11:22	11:34	Celine Schoving - Enhancing soybean phenology in crop models to evaluate its suitability.	Simone Bregaglio - Climate risk and suitability for European hazelnut (<i>Corylus avellana</i> L.) from expert knowledge, climate indicators, and process-based modelling	Adam Muhammad - A conceptual intercomparison of intercropping models: Insights from model developers and expert users

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11:34	11:46	Royer Pierrick - From measured traits to genotype-specific parameters: a modeling approach applied to maize phenology and development components	Jonas Jaegermeyr - Addressing near-term climate impacts in agriculture – comparing decadal predictions with scenario-based projections	Illiana winnemore Kwenda - Drivers of inter-annual variability in maize-cowpea intercropping performance along a climate gradient (To be confirmed)
11:46	11:58	Shinhye Lee - Simulating seasonal dynamics of P and N concentrations in maize aboveground biomass using DSSAT CSM-CERES and CSM-IXIM	Hélène Raynal - Identifying new agrometeorological zones for lucerne in present and future European climates using STICS model	Ermes Movedi - Simulation of the interspecific dynamics of Mediterranean annual sown grasslands.
11:58	12:10	Montserrat Salmeron - Uncertainties among soybean models in simulating N balance	Niccolò Renzi - Climate Change and Vineyard Irrigation in Tuscany: Environmental Impacts from a Multi-Model Perspective (To be confirmed)	Giorgio Ragolini - Modelling the Impact of Animal Stocking Rate and Crop Diversity on N circularity of European Dairy Cattle Systems
12:10	12:22	Xin Ge - An integrated energy balance framework for wheat leaf and spike under compound heat-drought stress	Mareike Koester - Climate change impact assessment on spring barley production across European environmental zones: Model-based projections using CMIP6	Ixchel Hernandez Ochoa - Optimizing crop allocation to improve field productivity and resilience under heterogeneous soil conditions
12:22	12:34	Joseph Vernier - How can microclimate simulation enhance plant growth modelling in complex environments?	David Ahiamadia - Predicting the impact of climate change on grass growth in the Republic of Ireland	Dominik Behrend - Continental-scale differences in winter wheat transpiration between historic and modern cultivars
12:34	12:46	Gerrit Hoogenboom - Using the ICASA Data Dictionary to Increase the “FAIRness” of Datasets for Crop Model Improvement and Applications	Madina Diancumba - Biophysical assessment of sustainable intensification in Northern Ghana under current and +2 °c conditions	Mirela Mujkic - DSSAT modelling of cover crop residues and tillage effects on N dynamics and maize productivity in Mediterranean climate
12:46	12:58	Xinxin Chen - Bridging literature and models: a workflow for creating agricultural datasets for model applications using AI	Poster Pitches Yusara A. - Estimating global soybean yield under multiple climate change projections using a process-based model MA-TCRO-Soy Folberth C. - Crop climate impacts and drivers across the CMIP6 ensemble and sub-ensembles Joshi M. - Linking climatic suitability and productivity of dryland crops during the Holocene using EcoCrop and LPJmL models Florian Z. - Bitter or Better? The climate future of cocoa cultivation De Freitas C.H. - Shifting Calendars? Spatial Patterns of Arabica Coffee Anthesis and Maturation under Climate Change in Brazil	Poster Pitches Cavalli D. - Towards dynamic and integrated modelling of plant-microbe interactions for sustainable multispecies agroecosystems Leolini L. - Diagnostic vs. prognostic modelling approach to estimate ecosystem fluxes in grasslands Katte A.S. - An integrated modeling framework for assessing environmental and agronomic outcomes for farm typologies in Germany
13:00	14:30	Break		

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14:30		15:30		Poster session 2 (Themes 2, 3 & 4)		
		Decision Making & Innovation Chair: To be defined	Climate Change Chair: To be defined	Sustainability & ESS Chair: Marc Corbeels; Martin Volk		
15:30	15:42	Ahmed Kheir - Hybrid ML_Hi-sA-Fe_LCA framework for climate-smart agroforestry decision support	Liangliang Zhang - Accelerated Variety Replacement Need for Climate Adaptation of Maize and Rice	Jing Yu - Modelling relay cropping in Germany		
15:42	15:54	Manpreet Singh - Growth-stage-based nitrogen management in cotton using critical N dilution and NNI (To be confirmed)	Ehsan Eyshi Rezaei - Warming winters enable water-saving shift to autumn sugar beet cultivation in Iran	Audrey Irene Deheinzelin - Disease regulation in intercropping systems depends on spatial arrangement – a modelling study		
15:54	16:06	Cameron Simoleit - Hybrid Training for the Prediction of Fungi on Winter Wheat	Quanbo Zhao - Air temperature thresholds of extreme heat exposure for maize and soybean in Northern Hemisphere breadbaskets	Yushan Wu - Modeling strip intercropping systems in APSIM Next Generation: The importance of strip width specification and intercrop traits		
16:06	16:18	Sahut Adèle - A parsimonious mechanistic crop model for decision support in herbaceous perennial crops: A case study on Asparagus (To be confirmed)	David Helman - Heatwaves, warming, and CO2 effects on U.S. Midwest soybean and maize: A functional comparison of process-based models (To be confirmed)	Corisande Douay - Multi-model predictive analysis of apple scab for apple tree pest management		
16:18	16:30	Allard de Wit - Predicting BBCH crop growth stages across the EU for regulation of pesticide application	Yutaka Tsutsumi-Morita - Fertilizer dependency of ground-level ozone impact on photosynthesis in rice: implications for crop modelling	Clement Sohoulade - Identifying Best Fertilization and Harvest Management for Forage Production under Supplemental Irrigation: A Model-Based Approach (To be confirmed)		
16:30	17:00	Break				
		Decision Making & Innovation Chair: To be defined	Climate Change Chair: To be defined	Food Systems Chair: To be defined		
17:00	17:12	Katrien Descheemaeker - Enabling farmers' innovation with models: A framework for mobilizing crop models into participatory approaches.	Frank Dentener - Effect of change in surface ozone pollution during the 2020 COVID-19 lockdown on wheat yields in Europe.	Spotlight Presentation		
17:12	17:24	Freeman Akaribo - Agricultural systems modelling and stakeholder engagement: A review of approaches and impact in Sub-Saharan African	Thuy Huu Nguyen - Combining ozone-T-FACE experimental data and crop models to assess elevated ozone and temperature effects on wheat growth in China	Tom Desmarez - Territorial food self-sufficiency under climate change through optimised crop rotations and STICS simulations		
17:24	17:36	Riccardo Rossi - Optimizing nomadic beekeeping management through integrated phenological models and short-term weather forecasts	Shaohui Zhang - Uncertainty of the rising atmospheric CO2 concentration on the global wheat productivity	Joao Vasco Silva - Agronomy, not genetics nor climate change, explains wheat yield plateaus in high-yielding environments of Northwest Europe		

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17:36	17:48	Sara Elisabetta Legler - Integration of crop models, agronomic knowledge and technology for the success of decision making in crop management	Haas Edwin - Climate Impact Analysis of the full Nitrogen Balance with the LandscapeDN-DC Model and EURO-CORDEX Ensembles for Greece	Sotirios Archontoulis - Scaling APSIM to Benchmark and Adapt US Maize Production Through Hydrology, Genetics, and Management Integration
17:48	18:00	Sumit Kumar Vishwakarma - Biomass and Yield Estimation of Rice-Wheat Cropping System Using UAV-based Machine Learning Algorithms and DSSAT Crop Model (To be confirmed)	Uttam Puri Goswami - Millet under Climate Change: Impacts and Effectiveness of Adaptation Strategies in South Asia (To be confirmed)	Yuji Masutomi - Crop.MoniCast: A Global System for Crop Monitoring and Yield Forecasting
19:30	22:30	Social Event: Award-recognition - Happy Hour		

Start time	End time	Wednesday 4 February		
		Plenary Keynotes		
09:00	09:30	Jessica Fanzo - Crop models for a climate- and nutrition-resilient future		
09:30	10:00	Daniel Rodriguez - Systems modelling for Agriculture and Food Security		
		Food Systems Chair: To be defined	Climate Change Chair: To be defined	Decision Making & Innovation Chair: To be defined
10:00	10:12	Luigi Ponti - Enhanced food security under global change requires a tritrophic perspective	Jonas Jaegermeyr - Simulating Productivity of Climate-Resilient Opportunity Crops Across Africa	Thiago Berton Ferreira - Assimilation of Remotely Sensed Data into the DSSAT-CSM model
10:12	10:24	Edmar Teixeira - Integrating agricultural and techno-economic models for optimising food supply chains: A concept study with plant proteins in New Zealand (To be confirmed)	Chiara Marchetti - Modeling genetic adaptation to support food security under climate change. A case study on barley in Ethiopia	Luca Bechini - When properly instructed, ChatGPT can provide accurate and site-specific irrigation decisions
10:24	10:36	Christoph Müller - Crop-model informed economic analysis of nitrogen tax effects on food production	Muhammad Habib-Ur-Rahman - Adaptation strategies for winter wheat under climate change using CERES-Wheat and N-Wheat models and CMIP6 climate scenarios	Chiara Marchetti - A model-based decision support framework for optimizing cultivar choice. A case study on <i>Pisum sativum</i> L.)
10:36	10:48	Claudio Russo - Ensemble Modeling and Multi-Criteria Analysis for Biofuel on Italian Marginal Lands	Asmae Meziane - Modeling Adaptive Management Strategies: Yield Outcomes and Emission Implications	Annimari Hartikainen - Data model for a digital twin of a field supporting interchangeable modelling approaches
10:48	11:00	Nikolas Galli - Mapping Italian agriculture: high resolution crop-specific areas and green and blue water demand for Italy's food system (To be confirmed)	Vera Potopová - Tomato yield under climate and socio-economic scenarios in the Elbe Lowland: DSSAT-CROPGRO simulations (To be confirmed)	Willingthon Pavan - VISTAA - Virtual Intelligent Simulation Tool for Agriculture Advisor

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		Advances in Models Chair: Gerrit Hoogenboom	Food Systems Chair: To be defined	Decision Making & Innovation Chair: To be defined		
11:40	11:52	Thiago Berton Ferreira - Simulating the Impact of Biotic Stresses on Wheat through Disease-coupled Multi-Model Ensembles	Dima Sabboura - Modelling the carbon footprint of oat across environments for plant-based milk substitutes	Willingthon Pavan - Expanding the Generic Disease Model for multi-disease, multi-cycle, and user-defined applications		
11:52	12:04	Roberto Ferrise - The FraNchE-stYN modelling framework for the synchronous estimates of yield losses due to plant diseases	Lennart Jansen - Attributable economic impacts of climate change for crop production in Germany are positive and significant	Bright Salah Freduah - Evaluating sustainable maize intensification strategies in smallholder farming systems in northern Ghana		
12:04	12:16	Cyrille A. Midingoyi - AgriScale: A distributed framework for gridded crop model ensemble applications	Julie Constantin - Developing energy cover crops in France: potential production for biogas and greenhouse gas balance	Edmealem Temesgen - Aqua-Crop-Machine Learning and IoT-Based Modeling of Lowland Wheat Yield and Water Productivity under Alternative Irrigation Schedules (To be confirmed)		
12:16	12:28	Marco Perfetto - Estimating spatial and temporal variability of crop growth by radiation-driven models based on satellite data assimilation	Ahmed Attia - The climate change mitigation potential of improved crop rotations – a long-term simulation study for Germany for the 21st century	Elodie Ruelle - On farm weekly grass growth prediction in Ireland, from the farm to national television		
12:28	12:40	Gabriel Mulero - Systematic bias in scaling wheat canopy radiation-use-efficiency (RUE): Implications for crop models and remote sensing integration (To be confirmed)	Teresa Murgia - Maize productivity under low-N input: a modelling approach to a future climate scenarios in Malawi	Angelo Basile - Applying Digital Twins and Geospatial Cyber-Infrastructure to Agricultural Policy and Practice		
12:40	12:52	Christina Mathias - Towards improved modeling of sugarcane radiation use efficiency: temperature dependence, crop age effects, and model formalisms	Danaë M.A. Rozendaal - Can deforestation-free cocoa production meet demand by 2060 under climate change? A crop-modelling study	Guillaume Bruelle - Potential of seasonal rainfall forecast to improve yields in sub-Saharan Africa: a proof of concept		
13:00		14:30		Break		

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14:30	14:42	Mariely Lopes dos Santos - Introducing the Radish Crop into the DSSAT-Cropping System Model	Anna Hampf - Climate change impacts and adaptation strategies for smallholder farmers in Madagascar	Yazen Al-Salman - The drivers of water use efficiency in aerobic rice under tropical south Indian conditions
14:42	14:54	Seong Eun Lee - Crop yield prediction of kimchi cabbage based on model-informed machine learning approaches	Mathilde De Freitas - Modelling cereal-cowpea intercropping to close the yield gap while reducing N demand under climate variability and climate change in West Africa	Harsh Nanesha - Brackish water irrigation in the Mediterranean: modelling strategies for sustainable crop production (To be confirmed)
14:54	15:06	Corné Verburg - Data-driven and interpretable crop growth modeling using sparse identification of nonlinear dynamics (SINDy)	Beatrice Monteleone - Insights on the impact of climate change on maize production in Italy using Convection Permitting climate Models	Christian Kersebaum - The effect of using different pedotransfer functions on modelling crop yield, water and N fluxes
15:06	15:18	Jingye Han - DeepCGM-generic: A Deep Learning Based Crop Growth Model for Multi-Varieties	Martina Clerici - Modeling the impact of climate and management scenarios on olive production and olive tree-olive fly interaction	Francisco Rojo - Bond Graph Modelling of Soil-Plant Water Dynamics for Multi-Scale Agricultural Irrigation Management (To be confirmed)
15:18	15:30	Armen Kemanian - Algorithm-driven root optimization for maize water uptake and yield in the Midwest	Raniero Della Peruta - Coffee yields in a changing climate: insights from multi-scale process-based modelling	Paul Southard - Integrated Hydrologic Modeling to Quantify Hydrologic Impacts of Natural Small Water Retention Measures
15:30	15:42	Ines Astrid Tougma - Integrating measurable-pool soil organic carbon and nitrogen into cropping system models	Gatien N. Falconnier - Simulating water and nitrogen stress in maize and groundnut: Implications for climatic risk in sub-humid Zimbabwe	Harouna Ouedraogo - Influence of zaï, stone barriers, and organo-mineral fertilization on soil properties and groundnut yield in the Sudano-Sahelian zone of Burkina Faso (To be confirmed)
15:42	16:42	Plenary Discussion		
16:42	17:12	Closing Plenary: Summary & Farewell		

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ORGANIZING SECRETARIAT

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