

Plan for Sharing Crop Modeling expertise during 2019

Introduction

The Community of Practice on Crop Modeling aims to collectively strengthen crop modeling capabilities among the CGIAR centres and collaborators. For achieving this purpose, the Community wants to play a critical role in facilitating and sharing knowledge, resources and information and by promoting the capacity building within its members.

One of the main objectives of the CoP on Crop Modeling was to conduct a **CGIAR wide gap analysis** to determine the strengths and weaknesses of each CGIAR center in terms of modeling capacity, **skills** and **expertise**, and to determine how modeling can support other research and outreach activities at the CGIAR centers. With this analysis, we aim to identify:



- Different **models, tools and databases** used for each center.
- Main **modeling goals** within each area
- Main **modeling inputs** in each area
- Necessities (tools, methods, access to databases, funding, needs for infrastructural support...) to achieve desired goals

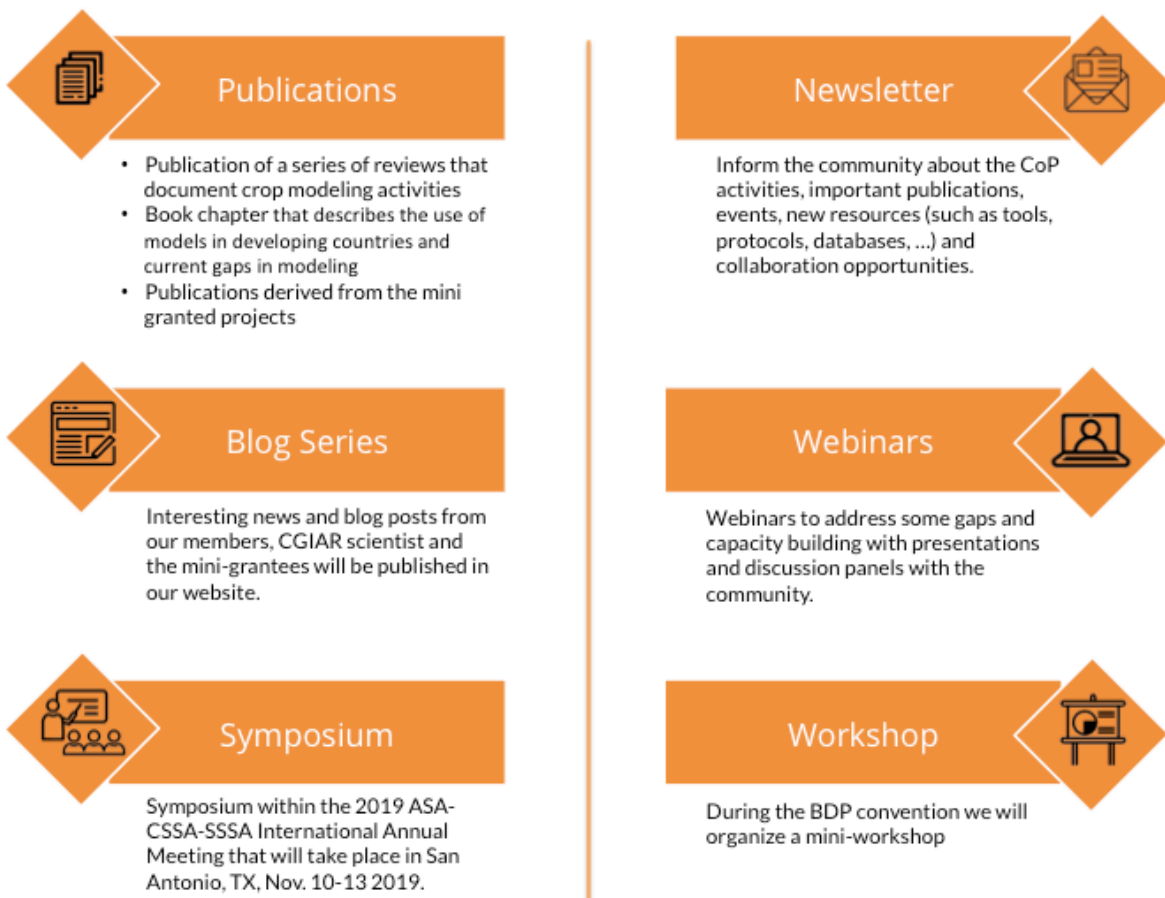
Based on these results, we have elaborated a plan for sharing the crop modeling expertise during 2019 that consists of different actions and channels.



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How knowledge will be shared by the CoP:



Sharing Crop Modeling expertise

PUBLICATIONS

Scientific publications are a great channel to share the last crop modeling results, express opinions and inform the scientific community about the research that an organization is conducting. During 2019 the Crop Modeling CoP will continue to share the expertise via scientific publications in high ranked journals. We plan to publish the following documents:



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- **A series of 4 Reviews** that document **crop modeling activities within CGIAR and collaborators** in the areas of **Crop Management, Environment, Breeding and Socio-Economics and Policy**.
- A **Book Chapter** for a book published by ASA-CSSA-SSSA will be written describing the use of models in developing countries, current **gaps in terms of modeling capacity**, skills and expertise, opportunities and moving forward.
- Support the **publications that derive from the CoP mini-grants** outcomes

As part of the CGIAR Platform for Big Data in Agriculture initiative, the Community of Practice on Crop Modeling was commissioned to develop a working document that reviewed the major work carried out on crop modeling activities at different CGIAR centers and external collaborators. To accomplish this goal, the CoP decided to elaborate a series of 4 different reviews under each of the four main drivers of crop production: Crop Management, Environment, Breeding, and Policy/Socio-Economic modeling activities. The reviews will showcase the value and potential impact of modeling/quantitative approaches in crop research at CG centers. The objective of these reviews is not only to present the main achievements on crop modeling, but detect the strengths, weakness and areas of expertise among the different CGIAR centers and collaborators. This will help us to determine the main crop modeling gaps and strategies for collaboration.

The CoP have contacted over 50 people from different CGIAR centers (CIAT, CIMMYT, IFPRI, ICRISAT, ICARDA, CIP, IRRI, and AfricaRice) and external collaborators (University of Florida, CSIRO, Wageningen UR, University of Leeds, Stanford University, INRA, Texas A&M, among others) who are contributing to the different manuscripts.

The tentative title of the reviews can be seen in Table 1:



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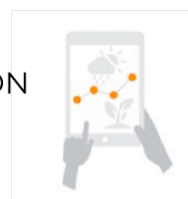


Table 1. Titles and main leaders of the Crop Modeling reviews

Review	Title	Review Main Leader
Policy/Socio-Economic	Policy and socio-economic crop modeling: overview and case studies from resource-constrained agricultural regions	<i>Gideon Kruseman, CIMMYT</i>
Crop Management	Modeling Crop Management of Resource and Climate Challenged Cropping Systems	<i>Balwinder-Singh, CIMMYT</i>
Breeding	Modeling in crop breeding: approaches used by CGIAR research centers for regional and global germplasm deployment	<i>Julian Ramirez-Villegas, CIAT</i>
Environment	Modeling the environment to better understand the challenges of resource-constrained farmers globally	<i>Glenn Hyman, CIAT</i>

The first drafts of the Policy and Socio-Economic modeling and the Crop Management reviews have been elaborated by the Crop Modeling CoP coordinator Dr. A. Molero-Milan and have been shared with the main leaders, Gideon Kruseman and Balwinder-Singh, respectively. The CoP coordinator is currently working in finishing a first draft of the remaining 2 reviews, which will be shared with the respective main leaders in March 2019. These 4 reviews will be published in a **special issue in Crop Science during 2019**.

SYMPOSIUM

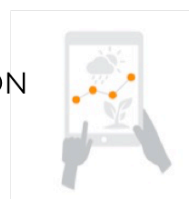
The Crop Modeling CoP will hold a **Symposium within the 2019 [ASA-CSSA-SSSA International Annual Meeting](#)** that will take place in San Antonio, TX, Nov. 10-13 2019.

The exact program will be defined during 2019, but the idea is to organize one or two symposiums of 2 hours each with the titles:

- 1) Predictive Agriculture Foundations I: Forecasting Crop Adaptation in International Agriculture (2 hours ~ 6 talks of 20 min)**



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2) Predictive Agriculture Foundations II: Advances in Predictive Breeding (2 hours, ~ 6 talks of 20 min)

The tentative list of the speakers with tentative topics to address:

- Presentation of the Crop Modeling Environment review led by the CoP on Crop Modeling (speaker: t.b.d, ideas: Glenn Hyman, Matthew Reynolds or Kai Sonder)
- Presentation of the Crop Modeling Crop Management review led by the CoP on Crop Modeling (speaker: Balwinder-Singh)
- Presentation of the Crop Modeling Breeding review led by the CoP on Crop Modeling (speaker: Julian Ramirez-Villegas)
- Senthold Asseng: Presenting some of his work (in col. with CGIAR?) about crop adaptation strategies

More details about the Symposium will be available during 2019. As an outcome from the Symposium, we plan to elaborate a booklet of extended abstracts that will be shared with the Community.

WEBINARS

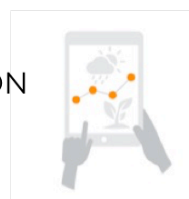
We plan to hold **two webinars** during 2019 to address some gaps and capacity building with presentations and discussion panels with the community. The proposed topics for the webinars are:

Webinar #1: GARDIAN and GEMS: Platforms for discovering, sharing and storing datasets and tools

- Speaker 1 (25 mins): Medha Devare. **Data sets discoverability by GARDIAN.**
- Speaker 2 (25 mins): Philip Pardey. **GxExMxS: A platform for sharing and storing data and tools.**



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- Open Discussion and questions (approx. 60 mins): Participants will be invited to address questions to the speakers, share their experiences/challenges regarding these two platforms.

Webinar #2: Minimum Data requirements for Crop Modeling purposes (in col. With AgMIP and the UF)

- **Minimum data requirements for crop modeling purposes (45 mins)**
 - Present the idea of different datasets categories for different levels of modelling, the minim standards in each category, and start a discussion about the requirements vs. reality. Speaker/s: Gerrit Hoogenboom, Senthold Asseng (t.b.d)
- **AgrO: Promoting model-ready data by GARDIAN (20 mins)**
 - Speaker: Medha Devare and Cheryl Porter
- **Standards protocols for data management (20 mins)**
 - Promoting standards protocols within the CGIAR centers for data management. Speaker: t.b.d (Someone from EiB)
- Open Discussion and questions (approx. 60 mins): Participants will be invited to address questions to the speakers, share their experiences/challenges regarding minimum data requirements.

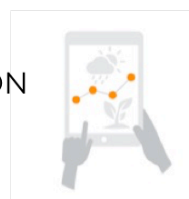
The webinars will be 2-2.5 hours long and will be afterwards published in the Crop Modeling website for a major diffusion among the CoP members. We plan to carry out the first webinar the first half of 2019 and the second webinar the second half of 2019. We plan to promote the webinars via the Newsletter, our Website and via email.

WORKSHOP

During the 2019 Big Data Platform convention that will be held on ICRISAT, the Crop Modeling CoP will organize a mini-workshop to present:



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- Updates from mini-projects
- Results from the reviews and gap analysis.

We will also take the opportunity to discuss desired learning topics and sharing activities with our members and to evaluate the CoP performance. The agenda for this mini-workshop is still provisional and will be better defined during 2019.

BLOG SERIES

During 2019 we plan to post and promote more news for the community, as well as the results from the mini-grants projects. The Crop Modeling CoP aims to **post at least 6 interesting news** in the CoP News section. So far, during 2019 we have posted the following news related to the outcomes of two of the mini projects that received funds from the CoP during 2017 and 2018:

- **Combining crop and disease modeling with numerical weather forecasting to inform wheat blast early warning systems in Bangladesh, Brazil and beyond**, led by Tim Krupnik.
<https://bigdata.cgiar.org/blog-post/cross-continental-disease-and-crop-modeling-collaborations-to-beat-back-wheat-blast/>
- **GARDIAN and facilitating data interoperability at CGIAR**, led by Cheryl Porter.
<https://bigdata.cgiar.org/blog-post/gardian-and-facilitating-data-interoperability-at-cgiar/>

NEWSLETTER

During 2019, the CoP will send a total of **4 Newsletters** (1 every quarter) to inform the community about:



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- CoP on Crop Modeling activities
- CoP Work plan validation
- Important publications
- Events
- New resources of interest for the community, such as tools, protocols, databases, ...
- Collaboration opportunities.