CropBooster-P summary progress year 3

Introduction

In the third year of the project, the progress of the CropBooster-P project was hampered due to the negative effects of the Covid-19 pandemic. To compensate for this, the European Commission did grant the project a 6-months extension, leading to a new end date of April 30th 2022. This will allow the successful completion of all Milestones and Deliverables with only a moderate delay.

As result of the international restrictions on travel and on organizing life events, all planned workshops and meetings in year 3 had to be cancelled and were replaced by online-alternatives. In this way, we were able to collect all relevant data needed for the completion of the CropBooster-P project.

Below, the main results and highlights of year 3 are presented:

WP2

An assessment was made by the WP2-team of the economic, social, and environmental impact of the identified strategies to future proof European crops, taking into account potential for increased yields, superior nutritional quality, and sustainability. This was achieved through a combination of expert panels, literature review, and data synthesis, and a workshop integrating and reviewing the partial outcomes from the tasks of WP2. The approach taken was to involve insights from key actors at each stage across the food-system considering economic, social, and environmental impacts of the future-proofing strategies. These actors were subsequently brought together to provide a food-system analysis in an integrating workshop. In the current reporting period, a multi-actor workshop was organized to integrate the different perspectives across farm, business and consumer level stakeholders. The main priorities identified in this workshop were:

- Farmers, consumers and plant scientists selected sustainability as the priority goal for crop improvement in the EU, whereas agribusiness representatives prioritised yields.
- Stakeholders across the agri-food system broadly agree that crop improvements that enhance sustainability- related traits are important for future-proofing the food system in Europe
- Improving plant water use, improving photosynthesis and increasing protein content and quality were identified as priority crop improvements in most stakeholder categories.

The outcome of the workshop was published in the report "Integrated Impact Assessment" (Deliverable 2.4).

WP3

The Work Package 3 team organized six online workshop focus groups with 30 participants from across the European agri-food sector.

Farmers, non-governmental organisations, reporters, community leaders, agri-food researchers, plant breeders, and businesses were invited to discuss the societal future-proofing needs and expectations regarding applying new plant breeding strategies in the European agri-food system. In the workshops a wide range of potential future-proofing strategies and their expectation and acceptability of new plant breeding techniques were discussed, leading to general agreements in decreasing order of importance as mentioned:

- Increasing food system resilience should go beyond the sole focus of plant improvement. It should also include integrated approaches on:
  - Digitisation to manage agricultural production systems
  - Improvement of soil quality
  - Reduced food loss and waste.

- Nonetheless, crop improvements are vital and should include strategies aimed at improving
  - protein quality,
  - nutrient uptake
  - water-use efficiency.

- For innovative plant breeding techniques, regulation and communication are deemed critical.
  - Regulations that keep up with technology are essential as large numbers of new plant varieties developed is difficult to trace from farm to fork and complicated by the geographically dispersed initiatives.
  - Open and transparent communication about the risks and benefits of the production chain and society is essential.
  - Involving society is essential to avoid the backlash GMOs faced.

The outcome of the workshops was published in the report "Societal Needs and Expectations on CropBoosting" (Deliverable 3.1).

Also in the framework of WP3, two "Citizen Juries" were organized to discuss with the general public the pro's and con's of modern plant breeding and to obtain their opinion about the potential use of New Breeding Technology. These juries were organized as online events and were held respectively in The Netherlands and in the UK. The most important outcome of these Citizen Juries was that both in The Netherlands as in the UK, the juries deemed the use of New Breeding Technologies acceptable, but under conditions, for instance, that the use of these technologies would be safe, and some kind of regulation and supervision would be in place.

WP4

In WP4, International Cooperation, 15 Focus Groups were established consisting of both members of the CropBooster-P consortium and of international academic experts outside of the consortium. These Focus Groups did evaluate the different options to increase crop yield, sustainability and quality, as defined by WP1, and broadened the scientific base underlying these options. Examples of topics that these groups did study are "Optimizing photosynthesis", "Increasing protein content and quality" and "Improving water uptake and water use efficiency". The results of these Focus Groups were presented and discussed in a 2-days online workshop and are reported in the "White Paper and Scientific Basis of the Strategic Research Agenda" (Deliverable 4.2).

WP6

The CropBooster-P Executive Committee together with EPSO director Karin Metzlaff published the opinion paper "Designing the Crops for the Future " in the Special Issue of Biology: Crop Improvement Now and Beyond. In this paper, the plans are presented for a large, pan-European research program: "The CropBooster Program". This proposed 10-year research program is envisioned to executed the Research Agenda that the CropBooster-P project is developing.