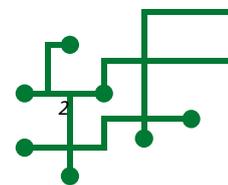


INNOVAR





Minutes of Annual Consortium Meetings Month 13

21st October 8.30am- 23rd October 4.00pm 2020

This report only reflects the views of the author(s).

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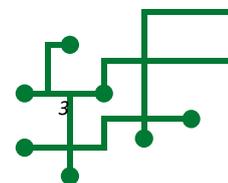


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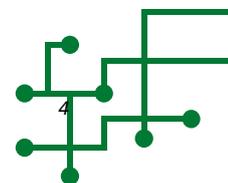


Table 1: InnoVar Partners

Partner No.	Acronym	Entity	Country
1	AFBI	Agri-Food and Biosciences Institute	UK
2	UCD	University College of Dublin	Ireland
3	CSIC	Consejo Superior de Investigaciones Cientificas	Spain
4	ADAS	RSK ADAS Limited	UK
5	UNIDEB	Debreceni Egyetem	Hungary
6	UNITUS	Università degli studi della Tuscia	Italy
7	TYST	Tystofte Foundation	Denmark
8	IPPL	I.P. Pragmatics	UK
9	ICARDIA	International Centre for Agricultural Research in the Dry Areas	Lebanon
10	UNIBO	Alma Mater Studiorum Università di Bologna	Italy
11	DAFM	Department of Agriculture, Food and the Marine	Ireland
12	DEFRA	Department for Environment, Food & Rural Affairs	UK
13	AHDB	Agriculture and Horticulture Development Board	UK
14	CREA-DC	Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria	Italy
15	ORIGIN	Origin Enterprises PLC	Ireland
16	UPM	Universidad Politécnica de Madrid	Spain
17	ISRIC	International Soil Reference and Information Centre	Netherlands
18	HORTA	HORTA S.r.l.	Italy
19	CONSULAI	CONSULAI, Consultoria Agroindustrial LDA	Portugal
20	NUIM	National University of Ireland Maynooth	Ireland
21	LESP	Lesprojekt-Služby Ltd	Czech Republic



Minutes of the first annual meeting for the InnoVar project:

21st – 23rd October 2020, Zoom, hosted by CONSULAI

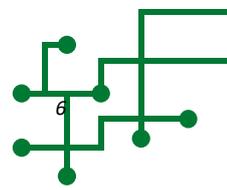
Minutes prepared by Hazel Brown and Lisa Black (AFBI)

Attendees:

InnoVar Partners			
AFBI	Lisa Black	CSIC	Gracia Montilla
AFBI	Gareth Burns	ORIGIN	Jimmy Burke
AFBI	Elaine Groom	ORIGIN	Varerian Istoc
AFBI	Hazel Brown	ORIGIN	Oleksiy Stetsenko
AFBI	Paul Cottney	ORIGIN	Marek Reich
UCD	Fiona Doohan	ORIGIN	Colin Lloyd
UCD	Harriet Benbow	ORIGIN	Colin Patrick
ADAS	Sarah Clarke	ORIGIN	Vasyl Moskalyuk
ADAS	Dave Skirvan	ORIGIN	Tomasz Haase
ADAS	Kate Storer	UPM	Patricia Giraldo
ADAS	David Green	UPM	Mario Fernandez
ADAS	John Boyce	UPM	Julio Isidro Sánchez
UNIDEB	Nóra Mender-Drienyovszki	UPM	Simon Rio
UNIDEB	Dr. Katalin Magyar-Tábori	ISRIC	Stephan Mantel
UNITUS	Roberto Mancinelli	ISRIC	Fenny van Egmond
TYST	Preben Klarskov Hansen	ISRIC	Johan Leenaars
IPPL	Rupert Osborn	ISRIC	Zhanguo Bai
IPPL	Ana Munoz	ISRIC	Jorge Mendes de Jesus
IPPL	Emma Walker	ISRIC	Eloi Ribeiro
ICARDA	Sripada Udupa	ISRIC	Luis de Sousa
UNIBO	Marco Maccaferri	HORTA	Matteo Ruggeri
UNIBO	Maria Angela Cane	HORTA	Valentina Manstretta
UNIBO	Matteo Bozzoli	CONSULAI	Dina Lopes
UNIBO	Danara Ormanbekova	CONSULAI	Carolina Mendes
DAFM	John Joe Byrne	CONSULAI	Francisca Viveiros
DEFRA	Michael Brown	NUIM	Andrew Parnell
AHDB	Sean Burns	NUIM	Rafael De Andrade Moral
CREA-DC	Anna Giuliani	NUIM	Danilo Sarti
CREA-DC	Tommaso Bardelli	NUIM	Alessandra Lemos Dos Santos
CREA-DC	Elena Novarina	LESP	Tony Kubicek
CSIC	Elena Prats	LESP	Karel Charvat

External Advisory Board		INVITE Partners	
QUB	Ethel White	INRA	Francois Laurens
QUB	Trevor Gilliland	CPVO	Cecile Collonnier
John Innes	Cristobal Uauy	Agroscope	Juan Herrera
BSPB	Sam Brooke	Teagasc	Ewen Mullins





Day 1- Wednesday 21st October

64 attendees

This day was for discussion of internal work package progress. Attendees included InnoVar partners, some INVITE partners, and members of the External Advisory Board (EAB).

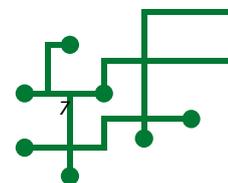
Before the meeting began Hazel Brown (Project Manager) reminded the attendees:

- Mics should be muted when not speaking
- The meeting is being recorded for internal purposes
- Partners are encouraged to use the chat function to ask questions and the “raise hand” function if they wish to speak during a presentation.

08.30am Opening meeting: Lisa Black and Fiona Doohan discussed progress and direction of the project, focusing on key areas:

- Data and machine learning: the database has been defined and developed; some historic data has been collected but this task has been slower than anticipated.
- Trials: trial sites identified, varieties selected, randomisations generated, protocols near finalisations, sowing commenced.
- Genomics: Seed sent for DNA extraction, QTL/MetaQTL analysis underway, and Association transcriptomics underway.
- Phenomics: 3 InnoVar partners and 1 INVITE partner conducting phenomics, drone specifications finalised, phenomics protocol near finalisation.
- Communication and stakeholder engagement: SharePoint for InnoVar partners, Increase in Stakeholder engagement, social media strategy, Website developed and launched, first newsletter produced.
- Deliverables: 16 deliverables submitted so far in the project.





08.45am: Work package presentations: WPLs present 20-minute PowerPoint on the progress of the work package and planning for the coming year, followed by time for questions from partners.

WP1 Project Co-ordination and Management: Lisa Black and Fiona Doohan.

Main issues in this work package in year 1:

- Movement of scientist
- Covid-19 impact on work planning
- Changes to budget due to Covid-19
- Retirement of Work Package 6 Leader
- Access to historic data more complex than anticipated.

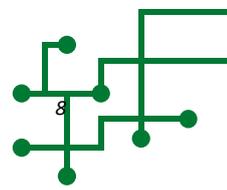
Amendments: 7 amendment types submitted as a package to the EC under the guidance of Silvia Abad, EC Project Officer:

- Modification of task
- Submission error - change to categorisation of personnel costs
- Move of deliverable submission dates (with associated extension of Task duration) and bringing forward a task.
- Task subcontracting.
- Move of scientist between beneficiaries
- Change of WP leader and EAB members.

Highlights:

- Task 1.1 Implementation of project support structures.
- Task 1.2 Data Protection Officer has been selected.
- Task 1.3 Distribution of funding, budget monitoring, financial reporting to commence.
- Task 1.4 On-going and unchanged.
- Task 1.5 all held virtually following the KOM.
- Task 1.6 WP6 will work closely with the Stakeholder Platform.
- Task 1.7 New exciting opportunities to collaborate with INVITE.





WP2 Defining characters and their genes: Tony Kubicek and Julio Isidro

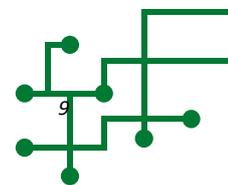
- Task 2.1: D2.1 “Identification of baseline data and data gaps” was submitted, after identifying gaps in historic data and genotypic data.
- Task 2.2: D2.2 “Online database structure developed” was submitted and the database was deployed on time. A report on this process was submitted to the EC as evidence.
- Task 2.3: Classify VCU trial and farm locations for type and degree of stress. Historic data is required for this task and due to the new protocol to acquire this data the task has been postponed to M28.
- Task 2.4: Augmenting the database with *de novo* genome-wide marker analysis data. This task is ongoing. D2.7 SNP analysis to be completed M15 pending partners sending seed to UPM
- Task 2.5: standardisation of protocols and selection of varieties for use in WP3 and 4. Varieties have been selected, site characters have been defined, DUS protocols have been defined, VCU protocols are near finalisation as this task was postponed, trial coordination is ongoing, meteo stations are expected by the end of November.
- Task 2.6: Maintain database with *de novo* data is ongoing.
- Task 2.7: Define and agree the models to test for predicting existing and new DUS and VCU characters is ongoing.
- Planning and risks: Currently the biggest risk for this WP is the collection of historic data. This task is crucial for many other tasks in the project.
- Negotiations with breeders and EOs are ongoing
- Fenny Van Egmond suggests the use of open soil data where possible.
- WP2 amendments: task 2.3, 2.5a with milestones and deliverables were transferred to UPM.

WP3 Innovation in DUS testing: Fiona Doohan and Preben Klarskov Hansen

- DUS trials for *T. aestivum* will comprise 286 varieties. The trial design and protocol has been established. A detailed description is available to partners on the SharePoint.
- Seed has been sourced and sent by partners to Denmark and Italy. Planting will commence next week, which is later than expected.
- Association transcriptomics will use a new technique to identify gene trait associations for *Septoria tritici* blotch. There have been delays due to covid-19 but all seed has been sourced and deliverables are on track.
- Rust trials need to be discussed with partners to solidify the plan.
- Literature search to source QTLs for important agronomic traits

10.30-11.00: Tea break





WP4 Innovation in VCU testing: Elena Prats and Lisa Black

- Task 4.1: A standardised VCU protocol has been agreed in task 2.5 covering *T.a* and *T.d*. Trials will be conducted to these protocols at locations which have now been set.
- Some decisions still need to be made at the trials workshop on day 3 of the meeting, including decisions about the organic trials which will begin next year.
- Task 4.2: All data from field trials, including soil, weather, agronomic and phenomic data collected according to the agreed protocols outlined in Task 2.5d and will be included in the *InnoVar* database (Task 2.6). Weather and soil characteristics of the sites will be assessed (by ISRIC and LESP). All data will be entered in the *InnoVar* database (WP2).
- Plans for WP4 include: perform the trials (M12-52); populate the database with the results of the trials (M12-52); Develop genetic and enviro-genetic models (M14-52); revise VCU protocols (M27-53); create a variety x HPLR category matrix at the end of each trial year (M20-52).
- Risks for this WP include: Difficulty accessing seeds and/or trials due to travel and transport restrictions; Staff managing the trials become ill or have to quarantine; Delays hiring staff.
- A question arose about the use of PGR which will be discussed at the trials workshop.

WP5 Translating knowledge to other crops: Anna Giulini and Nóra Mendler-Drienyovszki

- Partners will apply the approach developed using wheat to other important European crops which have now been chosen.

Progress so far:

- InnoVar partners have been asked for the VCU protocols in force in their countries for the selected crop types; built a model with the information collected
- sent the VCU table to other Europe countries to get information about their procedures and their skills on genomic and digital technologies, as we have done with bread and durum wheat
- Historical data accessible in Hungary and Italy includes Lucerne, maize, OSR, and potato.

Risks:

- Difficulty accessing VCU protocols; can be mitigated by collaborating with INVITE;
- Difficulty accessing historical data; can be mitigated by collaborating with national authorities or INVITE. This WP will be affected by the difficulty in accessing historic data which has been encountered throughout the project.



WP6 Synergies and future development: Gareth Burns and Preben Klarskov Hansen

Progress to Date:

- Deliverable 6.1 was successfully achieved through a report produced and submitted from the outcomes of the stakeholder platform forum that was held at Kick-off Meeting.
- An internal review of the stakeholder policies and processes in relation to Data Governance and GDPR compliance. An updated privacy policy, data privacy impact assessment and Legitimate Interests Assessment was carried out and associated documentation and processes were updated.
- The stakeholder questionnaire was disseminated and data collated, with a preliminary report produced to carry out a strategy review of the future direction of stakeholder engagement.
- Developed dissemination material, including content for website and social media.

Ongoing:

- Promoting Stakeholder platform via social media and partners' contacts.
- Arranging Annual Stakeholder platform forum(day 2 of meeting).
- Realising commitments in the MoU with INVITE.
- Engagement with INVITE in relation to areas of collaboration with both stakeholder platforms.

Planning:

- To improve stakeholder engagement, disseminate information from SH platform (task 6.1). Partners are encouraged to invite new stakeholders to the platform. Partners are also encouraged to update Gareth and Preben with any news that should be disseminated to the stakeholder platform.
- Collating and translating VCU protocols (task 6.2).
- Investigate synergies between DUS and VCU characters, including phenomics
- Drive for new stakeholders and the organisation of shared stakeholder events as outlined in the MOU. Shared stakeholder events between projects may be impeded by GDPR. Caution should be taken since this approach is still recommended because some SH companies don't like to be contacted multiple times. This will be linked to cross project working groups for collaboration.

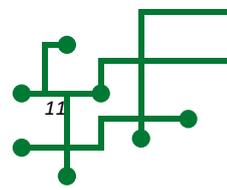
Realised risks:

- Loss of key staff member who has been replaced with minimal disruption.
- The ongoing covid-19 pandemic has had a low impact on this WP but the stakeholder event is being held online for the time being.

Emerging risks:

- There is an emerging risk of negative interactions with stakeholders in connection with data requests. Partners will be increasing positive engagement of stakeholders with the project.
- Some stakeholder demographics may be unresponsive. WP6 will review the process of targeting appropriate demographics.





12.30-13.30: Break for lunch

WP7 Variety recommendations and decision support for farmers: Sarah Clarke and Valentina Manstretta

Updates:

- Evaluation of current decision making systems was carried out and D7.1 was submitted in M12.
- Decision making methods developed D7.2 due in M15. Delays to Task 2.3 affecting 7.2.
- A variety decision making questionnaire was sent to partners and VCU authorities in the EU

Planning:

- 7.2 Share and agree HPLR categorisation methods. Agree definition of HPLR sustainability.
- 7.2 Update HPLR after task 2.3 reported (M28).
- 7.3 Start consultation with farmers about what they would like from a recommendation system.
- Explore collaboration possibilities with INVITE.

Risks:

- Further delay to reporting from Task 2.3 affecting HPLR category determination and development of web tool and app. Mitigated by communicating with relevant partners. Data from VCU trials will be available from 2020/21 season.
- Continuing Covid-19 restrictions limit opportunities for farmer consultation on app development plans. This may be mitigated by planning these sessions for later in the project so restrictions should ease by then. Utilise online forums which are now more familiar to farmers.



WP8 Communication, dissemination and exploitation: Dina Lopes and Gareth Burns

Updates:

- Communication Plan and Capacity Building Strategy was submitted as D8.1, and presented to WPLs as Ms8.1
- The project website has been developed and is now live, meeting Ms 8.1. This will be presented to meeting attendees at day 2 of the annual meeting.
- Social media strategy was approved as part of the CCB in March 2020, and implemented in August.
- Dissemination materials will include videos. Partners are requested to help with supplying footage as due to the pandemic CONSULAI can't use their usual techniques. A Newsletter has been prepared which will be uploaded to the website. Partners are reminded that the H2020 grant should be acknowledged in all outputs in accordance with the Grant agreement. Outputs should be made available by M18 reporting period.
- IP management and exploitation plan was submitted as D8.2 in June 2020. For Ms 8.3 Rupert will hold an IP exploitation workshop on day 3 of the annual meeting.

Planning:

- D8.3 Exploitation Strategy including action plans for key exploitable results (M18).
- D8.6 Report on implementation communication and capacity building strategy (M18).
- Website inputs.
- Publishing social media content is a continuous task throughout the project and AFBI & Consulai will engage with all partner to provide a diverse range in content.
- Video shooting/ editing.
- Update glossary to include EU acronyms.

No risks or amendments to declare for this work package.

15.00: End of day



Day 2- Thursday 22nd

Open to external stakeholders, the EAB, and some INVITE partners.

55 attendees

Before the start of the meeting Hazel gave the same housekeeping advice as on day 1 of the meeting.

8.30: Overview for the stakeholders - Lisa Black and Fiona Doohan

Lisa and Fiona introduced the project for the stakeholders, including:

- The purpose and importance of the project
- Why the test crops were chosen
- The technologies exploited by the project (machine learning, phenotyping and phenomics, genomics)

9.00: Website Tour - Francisca Viveiros

Francisca presented the website to the attendees <http://www.h2020innovar.eu/>

Dissemination of news is an important part of the project. Partners are encouraged to share news with WP8 partners in order to share on the website and on social media.

Social media content can form the basis of the news items but these should be expanded to include more information. For example; partners are posting photographs of the trial planting process on social media so these should be gathered together with an explanation and posted as a news item on the website.

09.30: INVITE collaboration: Lisa Black and Francois Laurens

4 key collaboration areas:

1. Project level meetings: reciprocal invitations to kick-off meetings and annual meetings. Additional meeting have been limited because of the pandemic, but there have been several virtual meetings held between project management teams from each project.
2. Meetings with stakeholders: INVITE did not hold a stakeholder platform this year but going forward these meetings should be a collaborative effort.
3. Communication and dissemination: reciprocal links on project websites. InnoVar has promoted INVITE on social media.
4. Technical and scientific tasks: shared common varieties, shared trial, shared approach to analysis of recommendation systems, phenomics.



10.00: Stakeholder Platform Meeting: Gareth Burns and Preben Klarskov Hansen

- Gareth gave an overview of the role of the stakeholder platform within the InnoVar project.
- The UK is currently overrepresented in the stakeholder forum. Partners are encouraged to invite more stakeholders to the platform to ensure the representation of stakeholders is reflective.
- Breeders are the most prominent interest group at this point.
- The stakeholder feedback implementation strategy will ensure the views and representations of key stakeholders are met and acted upon.
- Feedback will be disseminated through the website.
- Publicly available data is an important area to consider when taking in to account anonymization and data protection.
- Gareth invited stakeholders to discuss several areas of interest. The discussions focused on the area on data sharing and there was an ongoing discussion in relation to permission to use data and how to use it. Plant Breeders in the room emphasised the importance to them of anonymization of varietal names and protection of their commercial property was important if they are to engage in the plant variety testing processes.
- Discussion of society expectation of public granted project versus breeders' expectations to confidentiality.

11- 11.30: Tea Break

11.30- 12.30 External Advisory Board: Ethel White

This session was chaired by Ethel White and heard feedback on the project so far from four members of the EAB.

Cristobal Uauy- John Innes Centre, UK.

1. This is an exciting and ambitious project, which has so far dealt well with challenges. These new plant breeding technologies have the potential to be an important voice in that space. InnoVar is a powerful collective.
2. Weather information integration into machine learning will include future weather patterns. It would be beneficial to see varieties last longer so for this it is important to consider how the weather is going to be in 20-30 years, and include extreme weather events. Project partners should liaise with weather data providers including the met office who have a network of trialling sites to address this.
3. Think about DSS – stability criteria, indexes for stability and sustainability. What would a variety recommendation system look like with lower inputs – e.g. Weed burden?
4. Sustainability INDEX may be less focused on yield and more focused on sustainability, disease resistance etc. Consider a consistent definition of sustainability. “the past should inform the future”.
5. Genes- finding more relevant markers, as WP3 intends to, will help inform on disease resistance. This should be communicated to farmers by including this information prominently in the recommendation systems.



Samantha Brooke- British Society of Plant Breeders, UK

1. There are incredibly exciting aspects to the project. This project is massively ambitious and will produce huge amounts of data.
2. Breeder buy in through communication and interaction is absolutely key to the success of InnoVar. Breeders are well set up to current system, which may make breeders reluctant to increase diversity without encouragement. There are challenging times ahead for UK agriculture making InnoVar critical for UK breeding going forward.
3. DUS – synergies between DUS and VCU raise questions if the DUS protocol is to be altered. InnoVar is targeting the VCU protocol for now with an aim to add additional characters to DUS. VCU testing should be altered to fit its purpose: DUS benefits the breeders while VCU benefits the end market. Sustainability and resilience -> how to feed into VCU. How can DUS adapt and change?
4. Genomics for DUS testing is an exciting area of study, this has been explored in the past to determine distinctness. Would it increase the cost to breeder if more genomic tests were incorporated?
5. Stakeholders should be sought in the **crop protection industry** since the aim is lowering agro-chemical inputs. Agriculture no longer has the option of the “answer in a can” for performance issues. Previously crop success was due 70% crop protection and 30% genetics. Going forward this will be closer to 50:50.

Trevor Gilliland- Queens University Belfast, UK.

All compliments on the project given previously are echoed, this project is an achievement. InnoVar is still largely in the planning and implementation process and progress so far is good.

1. The surveys of crop testing and recommendation across Europe is an interesting area of study, which leads to the concept of EU VCU. This project has the potential to broach the concept of data sharing across ACZ, or even a pan European approach without having to break down political boundaries.
2. ‘What does success look like for the project?’ Success is not just completing deliverables. Success is the momentum and legacy after the project has ended. Trevor’s measure of success is that the testers and farmers use the tools developed. Specific stakeholders will be targeted at key stages further down the line as will wholesalers, merchants, etc.



Ethel White- Queens University Belfast

1. The relationships formed between the partners are valuable, as are the relationships formed with partners of the INVITE project Challenges so far have included the ongoing covid-19 pandemic, and staffing shortages.
2. This project may be the first time DUS and VCU have been included on the same project. Harmonising these two tests and including genomics and phenomics is highly valuable for the future scope of plant variety testing.
3. The approach to data handling is a key outcome of both InnoVar and INVITE. This is crucial to breeder relations.
4. Everyone has a different idea about what a variety is with regards to the reference collection, commercial varieties, etc. Ensure everyone involved with the project is clear about what we mean by the term “varieties”. There is still work to do around mapping out what is meant by technical terms used by partners.
5. Sustainability: due to the covid-19 pandemic, the green recovery agenda not getting as much airtime as it was previously. What has come to the foreground with regards to biodiversity loss? We need to examine what this looks like going forward, especially regarding what weather is coming our way. **A workshop about sustainability** including a robust definition in this context is a potential area for external engagement.

12.30: The need for Genomics in DUS- Trevor Gilliland

Professor Trevor Gilliland presented his recent papers:

“VMDUS - VALUE-MOLECULAR LINKED DISTINCTNESS DETERMINATION” which was presented at the UPOV Working Group on Biochemical and Molecular Techniques and DNA-Profiling in Particular, 23rd-25thSeptember 2020.

And

“A proposal for enhanced EU herbage VCU and DUS testing procedures” by Trevor J. Gilliland, Paolo Annicchiarico, Bernadette Julier, Marc Ghesquière, published in *Grass and Forage Science*, 16th December 2019.

This presentation detailed the Potential for using Molecular Distances as a vmDUS test.

12.45: Closing session

The EAB and stakeholders were thanked for their valuable input on the project.



Day 3: Friday 23rd

Feedback and planning day. This was a closed session for partners only.

9.30: IP Workshop- Rupert Osborn gave an overview of IP rights and responsibilities of project partners, including some important areas of IP relating to specific tasks.

10.00: Data, database, and machine learning- Tony Kubicek discussed the database structure and development. Partners will receive instruction on how the database is to be used.

Danilo Sarti explained the various methods to be implemented for the machine learning aspect of the project.

10.30: Tea break

11.00: SharePoint tour- Francisca Viveiros gave partners a tour of the SharePoint, including the resources that have been uploaded by partners, the privacy capabilities, and the

11.30: Genomics- Marco Maccaferri, Fiona Do

13.30: Trials workshop including protocols, soil, trialling, and phenomics- Lisa Black, Elena Prats, Preben Klarskov Hansen,

16.00: Closing session- Lisa Black and Fiona Doohan

Date of next meeting: 6th and 7th October 2021

