CropBooster-P

"Preparatory action to Boost Global Crop Yield for Food & Nutrition Security and fueling a Bioeconomy"

Type of action: CSA

Coordination and Support Action (CSA) aims to build the foundations and framework for a pan-European initiative

Horizon 2020
Call: H2020-SFS-2018-2020
(Sustainable Food Security)
Topic: LC-SFS-15-2018

Scope of CropBooster-P

- CropBooster-P main drivers are food security and climate change
  - How to we feed the global population in 2050?
  - How can we protect agriculture from the negative effects of climate change?

- CropBooster-P will draft a Roadmap to future-proof our crops
  - CropBooster-P explores options to improve plants, including aquatic plants, by breeding and/or by biotechnology.
  - CropBooster-P focus on yield, quality and sustainability

- Broad definitions:
  - Yield = total plant yield or yield of harvestable/edible parts of a plant
  - Quality = nutritional quality (e.g. protein content, carbohydrates, vitamins, minerals) or industrial quality (e.g. fibre composition, etc.).
    - Out of scope: organoleptic quality (taste, smell, mouth feeling, etc.)
  - Sustainability = resource use efficiency (e.g. water use, nitrogen use, etc) and abiotic stress resistance (e.g. heat stress, drought stress, mineral stress, etc.)
    - Out of scope: biotic stress resistance

- CropBooster-P intent to form a future, large scale consortium to execute the Roadmap
  - The Roadmap will also propose a blueprint for such a consortium, including its *modus operandi*

CropBooster-P: the participants

#	Participant Legal Name	Country
1	STICHTING **WAGENINGEN** RESEARCH (WR)	**NL**
2	**VIB**	BE
3	**WAGENINGEN** UNIVERSITY (WU)	NL
4	**CONSIGLIO NAZIONALE DELLE RICERCHE (CNR)**	IT
5	EUROPESE ORGANISATIE VOOR WETENSCHAPPELIJK PLANTENONDERZOEK (**EPSO**) IVZW	BE
6	HEINRICH-HEINE-UNIVERSITAET **DUESSELDORF** (UDUS)	DE
7	THE UNIVERSITY OF **NOTTINGHAM** (UNOTT)	UK
8	**JULIUS KUHN-INSTITUT** BUNDESFORSCHUNGSINSTITUT FUR KULTURPFLANZEN (JKI)	DE
9	CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE (**CNRS**)	FR
10	**KOBENHAVNS** UNIVERSITET (UCPH)	DK
11	**INSTITUT NATIONAL DE LA RECHERCHE AGRONOMIQUE (INRAE)**	**FR**
12	European Technology Platform **"Plants for the Future" (Plant ETP)** BE	
13	**LANCASTER** UNIVERSITY (ULANC)	UK
14	UNIVERSITATEA DE STIINTE AGRICOLE SI MEDICINA VETERINARA **CLUJ NAPOCA**	RO
15	**EUROPEAN SEED ASSOCIATION (ESA)**	BE
16	Association de Coordination Technique Agricole (**ACTA**)	FR

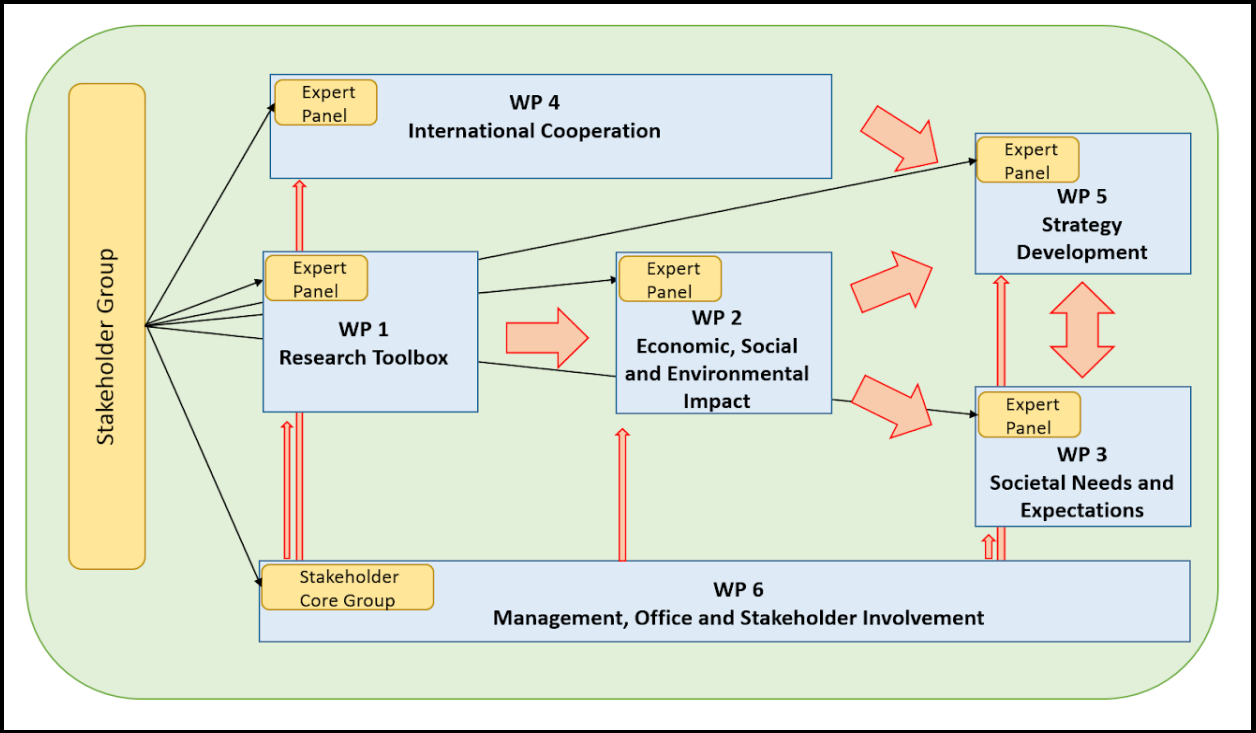


Table 3.1. a: List of work packages

Work package	Work Package Title	Lead Participant	Lead Participant Short Name	Person-Months	Start Month	End month
1	**Research Toolbox**	**2**	**VIB**	**64.7**	**1**	**12**
2	Economic, Social and Environmental Impact	13	ULANC	56		
3	Societal Needs and Expectations	8	JKI	46	12	30
4	**International Cooperation**	**11**	**INRAE**	**30.8**	**1**	**33**
5	**Strategy Development**	**3**	**WU**	**34.8**	**1**	**36**
6	Management, Office and Stakeholder Involvement	1	WR	19.6	1	36
				person -months	251.9	

WP1 Research Toolbox (VIB)

Participants: VIB, CNR, UDUS, UNOTT, JKI, UCPH, **INRA**, ULANC, WU, ACTA, EPSO, **CNRS**, Plant ETP, USA MV CLUJ

Objectives

Overall Objective: Compile a **matrix listing transferable strategies, methods and technologies for a sustainable yield improvement of nutritious crops to achieve food security, indicating future trends and enablers to increase or unlock the potential of certain crops or technologies in Europe**. This **toolbox can be used to direct future plant research in Europe**. Discussions with relevant Stakeholders, and their insight, will be crucial to achieve this.

Task 1.1 Perform integrated and forward-looking analyses with the stakeholders (two-day workshop) **(M1-M7)**
Task leader: **ETP**; other partners: EPSO, JKI, ULANC, VIB, INRA, UCPH, CNRS

Task 1.2 Study program to map current and future methods/technologies for improvement of yield in different terrestrial and aquatic species **(M1-M8)**
Task leader: **VIB**; other partners: CNR, UDUS, UNOTT, JKI, UCPH, INRA, ULANC, WU, ACTA, EPSO, CNRS

Task 1.3 Study program to map current and future methods/technologies for improvement of nutritional quality in different terrestrial and aquatic species **(M1-M8)**
Task leader: **UCPH**; other partners: INRA, JKI, USAMV, ACTA, UDUS, CNR, CNRS, EPSO

Task 1.4 Study program to map current and future methods/technologies/traits for improvement of sustainability in different terrestrial species **(M1-M8)**
Task leader: INRA; other partners: UCPH, UNOTT, EPSO

Task 1.5 Compile a matrix listing transferable strategies, methods and technologies for a sustainable yield improvement of nutritious crops to achieve food security **(M8-M12)**
Task leader: **VIB** other partners: INRA, UCPH, JKI, CNRS, EPSO, ULAN

Milestones and Deliverables

D1.1: Outcome of the two-day workshop with SHG – Report with meeting minutes and action points, D1.2a: Preparatory documents ready for discussions during workshop with Stakeholder (Core) Group on yield improvement –M5
D1.2b: Assess and digest the outcome and recommendations of the workshop regarding yield improvement as input for Task 1.5 –M8
D1.3a: Preparatory documents ready for discussions during workshop with Stakeholder on nutritional improvement –
D1.3b: Assess and digest the outcome and recommendations of the workshop regarding nutritional improvement as input for Task 1.5
D1.4a: Preparatory documents ready for discussions during workshop with Stakeholder (Core) Group on improvement of sustainability–
D1.4b: Assess and digest the outcome and recommendations of the workshop regarding sustainability improvement as input for Task 1.5
D1.5: **Deliver Matrix and Report discussing strategy forward for future plant research in Europe that can be used as input for subsequent WPs** - M12.

WP2 Assessing Economic, Social and Environmental Impact (ULANC)

Participants: ULANC, WU, ESA, ACTA, WR, INRAE, JKI

Objectives

Overall Objective: **Assess the potential economic, social and environmental impact of the most highly-ranked future proofing strategies**, as indicated by the multi-dimensional performance matrix resulting from WP1.

***Task 2.1: Agricultural production impact assessment* (M12-M24)**
Task leader: ULANC, other partners: Plant ETP, ACTA

***Task 2.2: Business impact assessment* (M12-M24)**
Task leader: ULANC, other partners: Plant ETP, ESA, INRA, JKI

***Task 2.3: Consumer impact assessment* (M12-M24)**
Task leader: **WU**, other partners: WR

***Task 2.4: Food system impact assessment integration* (M21-M30)**
Task leader: ULANC, other partners: WR, WU, ACTA, INRA, Plant ETP, ESA, JKI

Deliverables

D2.1: Agricultural production impact **working paper** (M22) to be developed into international journal article.
D2.2: Business impact **working paper** (M22) to be developed into international journal article.
D2.3: Consumer impact **working paper** (M22) to be developed into international journal article.
D2.4: **Integrated impact assessment outcomes report** to the commission (M30)

WP3 Societal Needs and Expectations (JKI)

Novembre 2019-octobre 2021

Participants: JKI, CNR, ULANC, WU, Plant ETP, VIB, EPSO, USAMV CLUJ

Objectives

This work package **involves societal (including non-expert) actors to consider their values, needs, and expectations being associated with novel technologies for increasing crop yield and nutritional quality in future agriculture**, elaborate on an appropriate strategy to improve public awareness and trust ensuring a full understanding and uptake of novel technologies relative to plant improvement and nutrition security in mid-term.

Task 3.1: Implementing the engagement with social actors following RRI principles **(M12-M34)**
Task leader: **WU**, other partners: CNR, EPSO, ULANC, USAMV CLUJ, VIB, WR

Task 3.2: Increase public awareness and trust in novel technologies – an outreach strategy **(M1-M36)**
Task leader: **JKI** other partners: CNR, EPSO, ESA, ETP, ULANC, USAMV CLUJ , WR

Deliverables

D3.1a: Consultation report on the first consultation step (M26)
D3.1b: Consultation report on the second consultation step (M34)
D3.2: **Recommendation dossier on mid-term outreach measures to increase public awareness and understanding of novel technologies** (M36)

WP4 International Cooperation (INRAE)

Participants: VIB, WR, WU, CNR, EPSO, UDUS, UNOTT, JKI, CNRS, UCPH, INRA, ULANC, USAMV, ESA, ACTA

Objectives

The overall objective of the WP4 is **to set up the framework necessary for the WP5 by strengthening the international research cooperation** on sustainable improvement of crop yield, and nutritional quality.

This aim will be first achieved by assessing and connecting pre-existing research networks and projects (see Table 1.3), and mapping gaps of cooperation and areas where international cooperation promises fruitful results (T4.1). Then, based on scientific evidences, tools, strategies and approaches identified in WP1, environmental and economic impact assessments (WP1, task "sustainability" and WP2) and stakeholder's demand (WP3), **joint meetings will be organized between European plant scientist from different disciplines and ongoing research programs** (T4.2) and identified SHG members (see Table 4.3). **White Papers and joint research visions will then be produced (T4.3) by groups of international experts reviewing literature and synthesizing strategies on the scientific basis of existing and future tools and approaches to feed WP5**

Task 4.1. ***Map gaps of cooperation and areas where international cooperation promises fruitful results*** **(M1-M18)**
Task leader: **UDUS;** other partners: WR, VIB, CNR, EPSO, UNOTT, **CNRS**, UCPH, **INRA**, ULANC, USAMV, ESA

T4.2: **(M12-M24)** ***Strengthening the international research interaction***

Meeting Versailles June 2021

Task leader: **INRA;** other partners: WR, VIB, WU, CNR, EPSO, UDUS, UNOTT, JKI, **CNRS**, UCPH, ULANC, USAMV, ACTA, ESA

T4.3 ***Reviewing scientific and technical strategies on the scientific basis of existing and future tools and approaches*** **(M12-M33)**
Task leader: **CNRS;** other partners: WR, WU, CNR, EPSO, UDUS, UNOTT, JKI, INRA, UCPH, ULANC, ACTA

Deliverables

D4.1: Network map of interactions (M18) that will provide **the first stock-take of research networks available for further scientific interaction**s and will provide evidence for presence, or deficiency, of relationship among and across existing networks.

D4.3: **Areas for sustainable improvement of crop yield, and nutritional quality defined and white papers on the scientific basis of a strategic research agenda available** (M33).

WP5 Strategy Development (WU)

Participants: WU, WR, EPSO, ESA, ETP, JKI, CNRS, ULANC, UDUS, INRAE, UNOTT, CNR

Objectives

The goal of this work of package is **to develop a strategy, or roadmap, for the implementation of Europe-wide programme to improve crop yield and resource-use efficiency** (especially for water and fertilisers), **and guarantee crop nutritional quality for food and feed.** … The final product of this work package will be the **production of a white paper that summarises the outcomes of the programme as a whole, lays out the options for a European programme on crop yield improvement that will maintain product quality…**

Task 5.1: Product quality **(M3 - M7)**
Task leader **WU**, with ETP, CNR, ESA.

Task 5.2. IP management **(M7 - M11)**
Task leader **WU**, with WR, JKI

Task 5.3. Programme management and supervision **(M12-M18)**
Task leader **WU**, with EPSO, JKI, INRA

Task 5.4 Responsibility and morality **(M17-M24)**
Task Leader **WU**, with UNOTT, JKI

Task 5.5. Communication and outreach strategy **(M10 -M16)**
Task Leader **WU**, with EPSO, ESA, CNR, JKI

Task 5.6 . Research Plan **(M19-M29)**
Task Leader **WU** with UDUS, JKI, CNR, ULANC, CNRS

Task 5.7 White Paper **(M26-M35)**
Task Leader **WU** with UDUS, JKI, CNR, ULANC, CNRS

Milestones and Deliverables

D5.1: A report specifying of the form in which the products of research will be best made available to the plant breeding sector (M7)
D5.2: A report describing the intellectual property management framework (M11)
D5.3: A report describing programme management structure (M18)
D5.4: A report describing the framework for expressing the moral correctness of the programme + ensure public support for the programme (M24)
D5.5: A report describing communication policy for the programme (M16)
D5.6: A research plan for a future European crop yield programme (M30)
D5.7: A white paper describing the route to improved crop yields, nutritional quality and environmental protection in Europe, including the future consortium M36

WP6 Management, Office and Stakeholder Involvement (WU)

Participants: WU, WR, EPSO, ESA, ETP, JKI, **CNRS**, ULANC

Objectives

This work package will **ensure the realization of the overall project objectives, milestones and deliverables**, and the efficient execution of the project over the funding period in accordance with European regulations. In addition, a Project Office will be established which, amongst other, will be the central hub for all **dissemination and communication activities** of the project.

Task 6.1: Overall project management, strategic coordination and risk management **(M1-36).**
Task leader: **WR**; other partners: VIB, WU, JKI, ULANC, **CNRS**

Task 6.2: Establishment and coordination of the Stakeholder Group (SHG) **(M1-36)**
Task leader: EPSO, other partner: Plant-ETP

Task 6.3: External project oversight **(M1-36)**
Task leader: **WR**

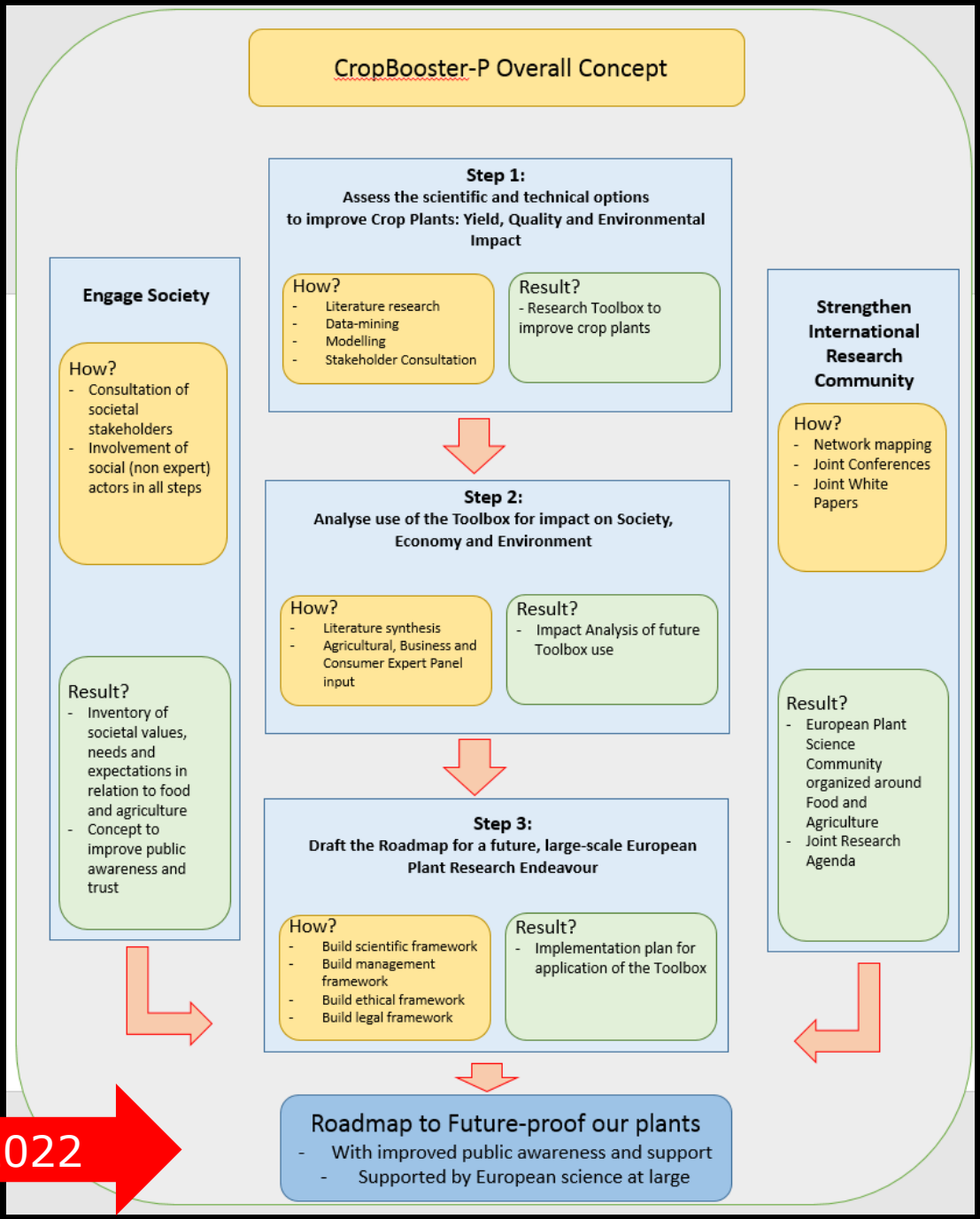
Task 6.4: Reporting and finance **(M1-36)**
Task leader: **WR**

Task 6.5: Contractual and legal management **(M1-36)**
Task leader: **WR**

Task 6.6 Outreach and Communication **(M1-36)**
Task leader: **WR**, other partners : ACTA

Milestones and Deliverables

M6.1a-d Kick-off and Annual Project **Meetings** organised (M2, M12, M24, M34)
M6.1e-g **ExCom meetings** organized (M6, M18, M30)
M6.2 **Stakeholder Group** established (M4)
M6.3 Stakeholder Core Group (SH Core Group) installed (M4)
D6.6 Project **Website** (M4)
D6.5 **Data Management** Plan (M6)


CropBooster-P Overall Concept
Step 1:
Assess the scientific and technical options to improve Crop Plants: Yield, Quality and Environmental Impact
How?
- Literature research
- Data-mining
- Modelling
- Stakeholder Consultation
Result?
- Research Toolbox to improve crop plants
Step 2:
Analyse use of the Toolbox for impact on Society, Economy and Environment
How?
- Literature synthesis
- Agricultural, Business and Consumer Expert Panel input
Result?
- Impact Analysis of future Toolbox use
Step 3:
Draft the Roadmap for a future, large-scale European Plant Research Endeavour
How?
- Build scientific framework
- Build management framework
- Build ethical framework
- Build legal framework
Result?
- Implementation plan for application of the Toolbox
Engage Society
How?
- Consultation of societal stakeholders
- Involvement of social (non expert) actors in all steps
Result?
- Inventory of societal values, needs and expectations in relation to food and agriculture
- Concept to improve public awareness and trust
Strengthen International Research Community
How?
- Network mapping
- Joint Conferences
- Joint White Papers
Result?
- European Plant Science Community organized around Food and Agriculture
- Joint Research Agenda
Roadmap to Future-proof our plants
- With improved public awareness and support
- Supported by European science at large
2022

CropBooster-P

Roadmap to future-proof Europe's plants

WP4: International Cooperation

Norbert Rolland (INRAE/CNRS)
Peter Westhoff (UDUS)
Günter Strittmatter (CEPLAS/UDUS)

European Commission
Horizon 2020
European Union funding for Research & Innovation

Work package 4: International Cooperation [Months: 1-36]
INRAE, WR, VIB, WU, CNR, EPSO, UDUS, UNOTT, CNRS, UCPH, ULANC, USAMV CLUJ, ESA, ACTA

Task 4.1. This task aims to map the existing research communities using existing formal and informal EU networks **(M1-M18->M24).**
Task leader: UDUS; other partners: WR, VIB, CNR, EPSO, UNOTT, CNRS, UCPH, INRA, ULANC, USAMV, ESA, SORBONNE, ARVALIS

- Research communities (physiologists, geneticists, breeders, modellers, agronomists, socio-economists, pathologists, etc…) who are mostly coming from academic organisations (Research Institutes and Universities).
- Create a network model of existing or lacking interactions from the mapping of national or international communities and projects, and their distribution within Europe.
- Applied Research communities (Private companies, R&D services of Cooperatives, Technical Institutes, networks of Experimental Stations etc.).
- Selecting people from all partners at European level to assemble an expert panel.

Aim of the first step:

- Research communities (physiologists, geneticists, breeders, modellers, agronomists, socio-economists, pathologists, etc…) who are mostly coming from academic organisations (Research Institutes and Universities).

The aim of this study was to **identify the main European institutions** which publish in the fields corresponding to the different traits identified during WP1 as being able to improve yield.

Method: Screening of the scientific production (**WoS**) during five years **(2015-2019)** using key terms linked to traits (Yield, Sustainability, Nutritional quality) selected during the WP1.

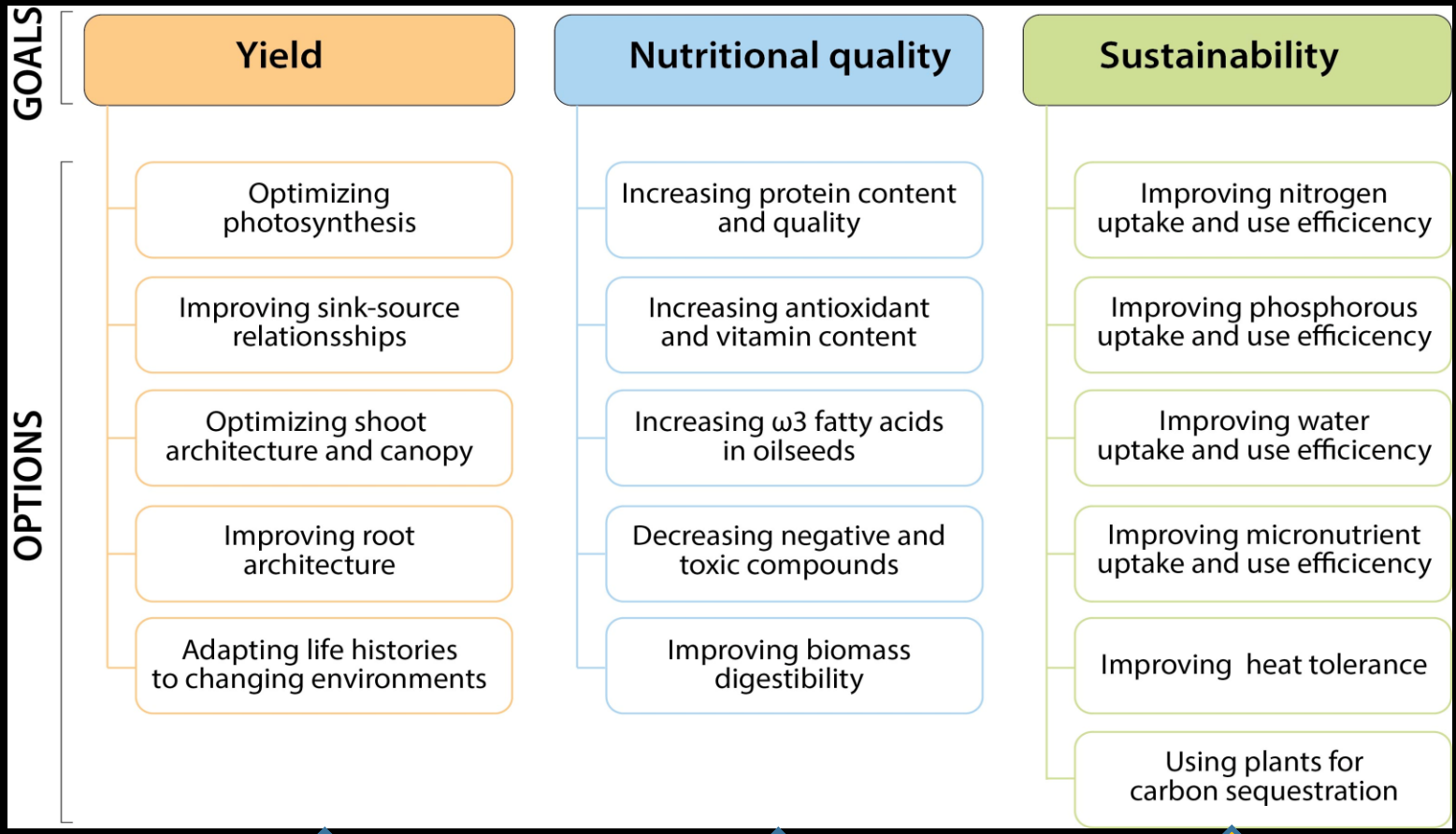
A **total of 14,053 publications were collected and analyzed for "yield" and "sustainability" (step 1) + > 10,000 publications for "nutritional quality" (step 2)**.

Dominique Fournier, INRAE, Montpellier, France
Jacqueline Martin-Laffon, CNRS, Grenoble, France
Bertrand Muller, INRAE, Montpellier, France
Philippe Nacry, INRAE, Montpellier, France
Norbert Rolland, INRAE/CNRS, Grenoble, France

Selected traits for the literature screening

(According to WP1 and WP2)

Step 1: "Yield" and "sustainability"

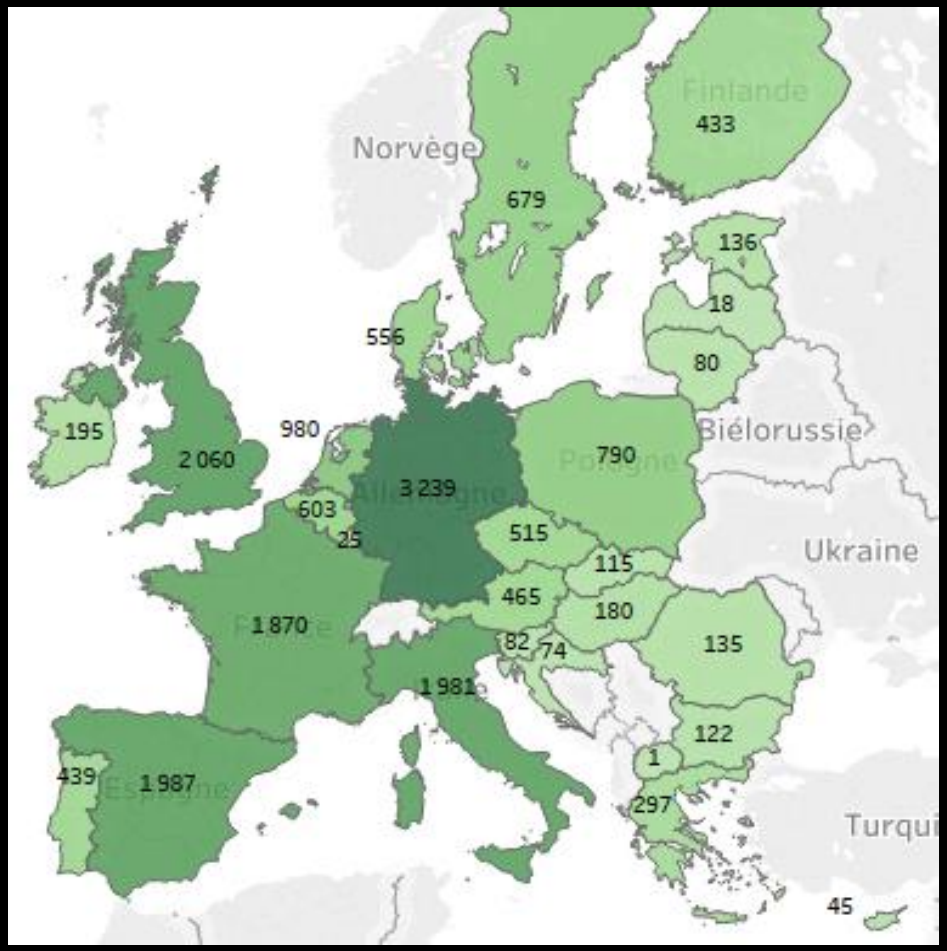


Part of UE28 in the publications collected and analyzed

Traits identified by experts in WP1	Publications UE28	Publications World	Publications UE28 / World
Nutrient-uptake	3 070	8 822	35%
Secondary-metabolism	3 040	8 880	34%
Growth-rate	1 960	7 119	28%
Nutrient-metabolism-transport	1 655	5 585	30%
Biochemistry-carbon-assimilation	1 372	3 491	39%
water-use-efficiency	1 226	4 371	28%
Nutrient-use-efficiency	824	3 001	27%
Photochemistry	669	1 543	43%
Photoprotection	556	1 288	43%
Shoot-architecture	492	1 454	34%
Primary-metabolism	455	973	47%
Source-Sink Balance	414	1 209	34%
Leaf-anatomy	263	885	30%
Source Web of Science Clarivate Analytics – 2015-2019 – Treatment INRAE/CNRS 2020 - Article , Review, Proceeding Papers or Letters			

Note that, in these research fields, publications signed by EU28 scientists represent between 27% and 47% of global scientific production.

Origin of the 14,053 publications at EU28 scale

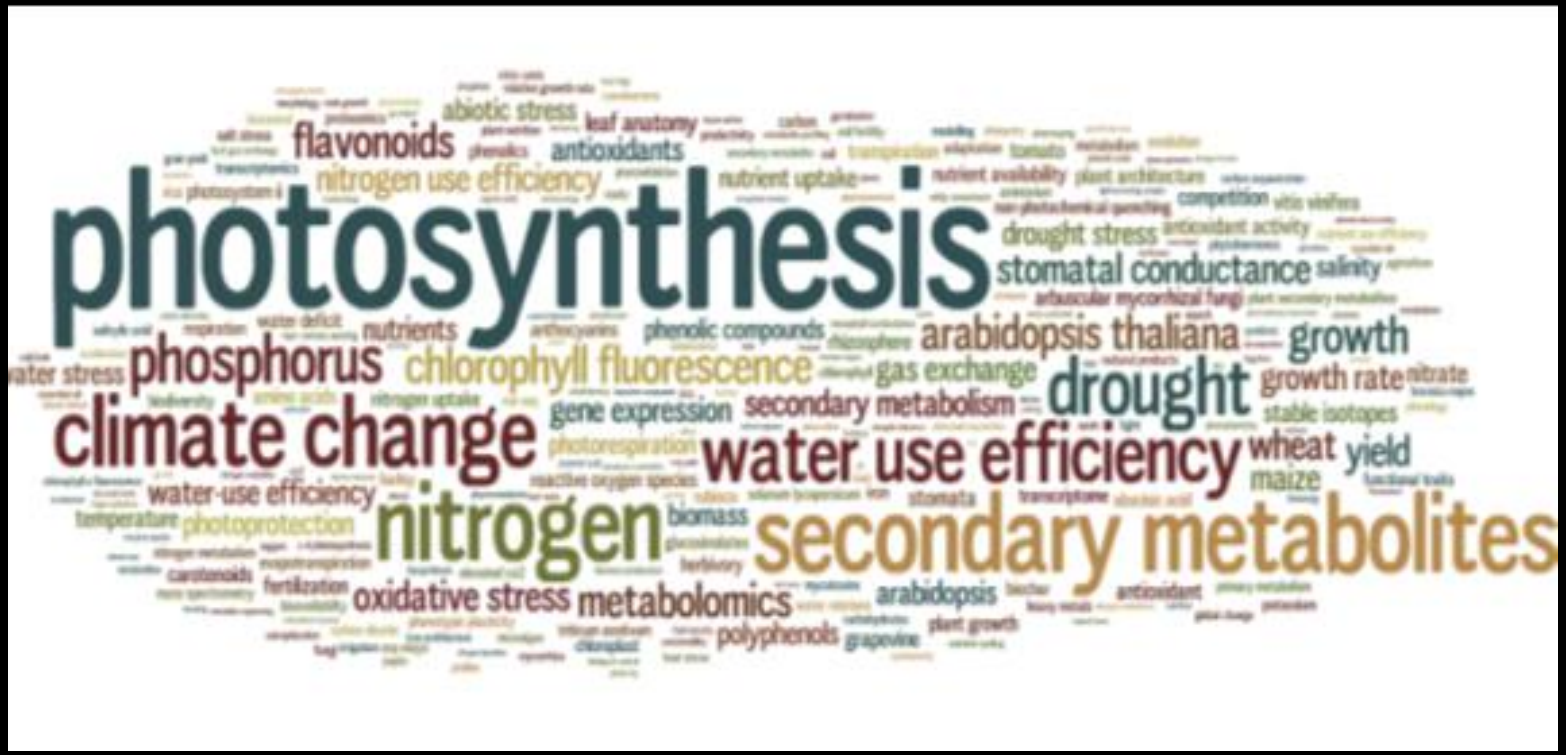


Analysis of publications Web of Science™ 2015-2019

Author Keywords

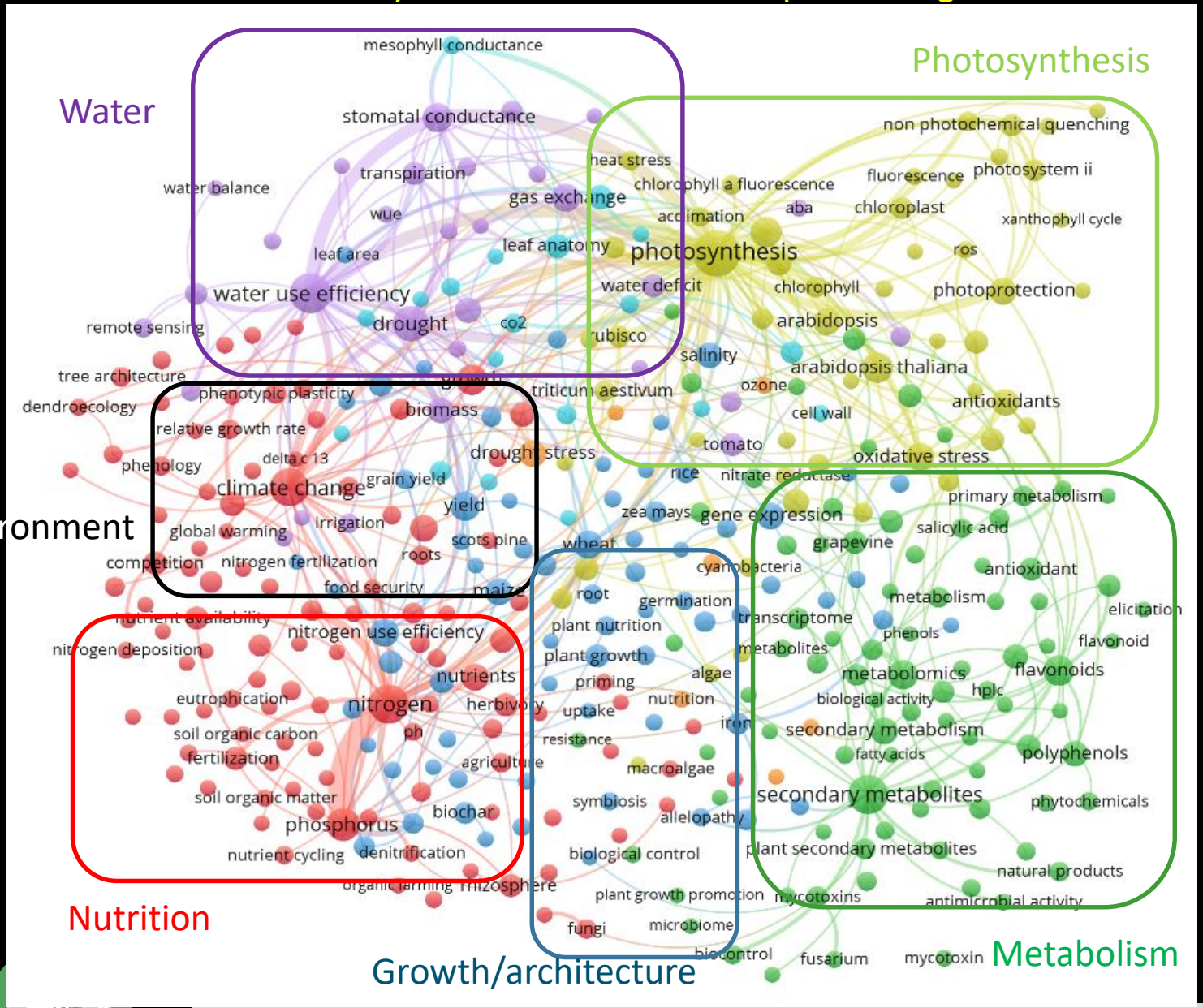
Keywords (>24 occurrence) associated to WP1 selected traits (Yield, Sustainability) as cited by authors of the 14,053 publications published by UE28 institutions (2015-2019)

WP4 literature screening



Keywords > 20 occurrences

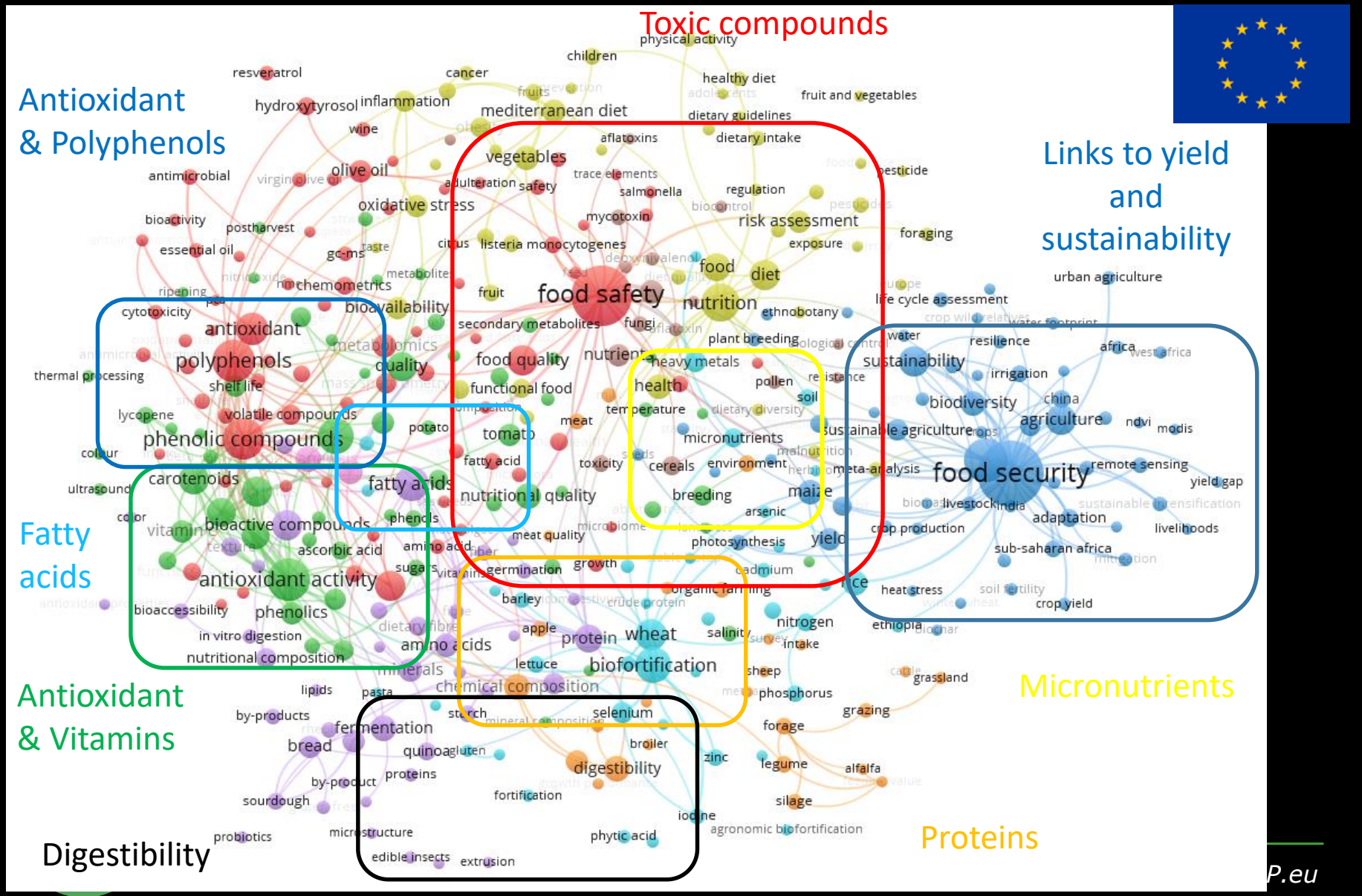
Network of keyword co-occurrence helps defining main research fields



The network represents the co-occurrences of the main author keywords (minimum 20 occurrences, or 370 keywords) and the links indicate the existence of at least 5 publications with the 2 terms (threshold: 5, files Vosviewer network-Keywords-DE-20min-link-5-map.txt and network-Keywords-DE-20min-link-5-net.txt).

- ***Nutritional quality:*** ***General analysis (> 10,000 publications)***

Keywords Network of **keyword co-occurrence** defines **research fields**



Main actors (institutions) in all fields

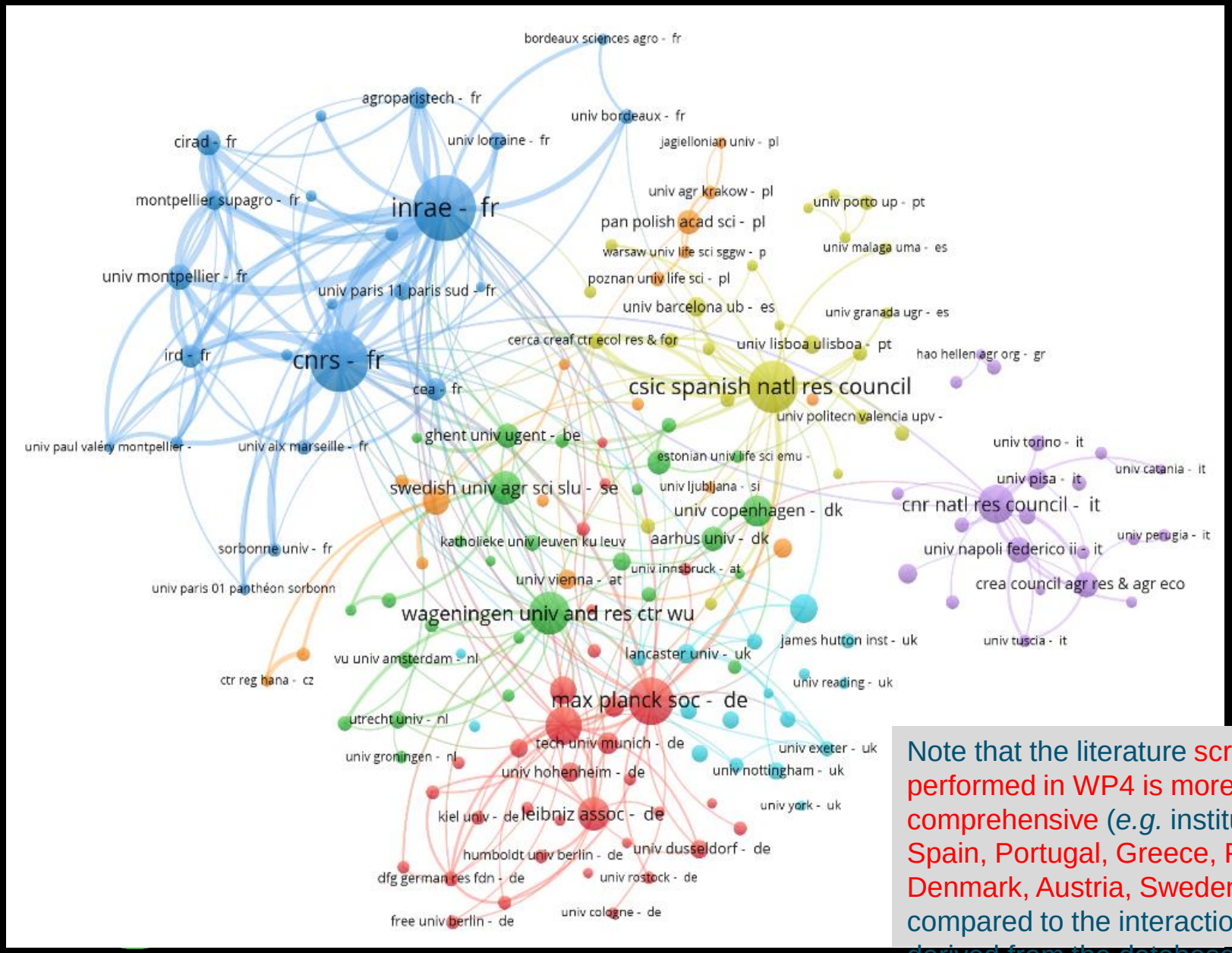
Publications by EU28 institutions
(threshold: at least 200 publications, 2015-2019 period).

Main actors in UE28 (> 200 publications)	Publications 2015-2019	Publications with UE28	% publications with UE28
INRAE - FR	1012	351	34,7%
CNRS - FR	885	345	39,0%
CSIC Spanish Natl Res Council - ES	690	281	40,7%
Max Planck Soc - DE	574	271	47,2%
Wageningen Univ and Res Ctr WUR - NL	496	231	46,6%
Helmholtz Assoc - DE	413	194	47,0%
CNR Natl Res Council - IT	405	141	34,8%
Leibniz Assoc - DE	331	126	38,1%
Swedish Univ Agr Sci SLU - SE	323	159	49,2%
Univ Copenhagen - DK	297	118	39,7%
BBSRC Biotech & Biol Sci Res Council - UK	266	98	36,8%
Univ Gottingen - DE	247	64	25,9%
Acad Sci Czech Rep - CZ	245	118	48,2%
CREA Council Agr Res & Agr Economics - IT	215	60	27,9%
Univ Montpellier - FR	210	73	34,8%
Univ Napoli Federico II - IT	210	72	34,3%
Cirad - FR	206	40	19,4%
Ghent Univ UGent - BE	201	95	47,3%
Aarhus Univ - DK	200	80	40,0%
Source Web of Science Clarivate Analytics – 2015-2019 – Treatment INRAE CNRS 2020 - Article, Review, Proceeding Papers or Letters			

Partner of CropBooster-P

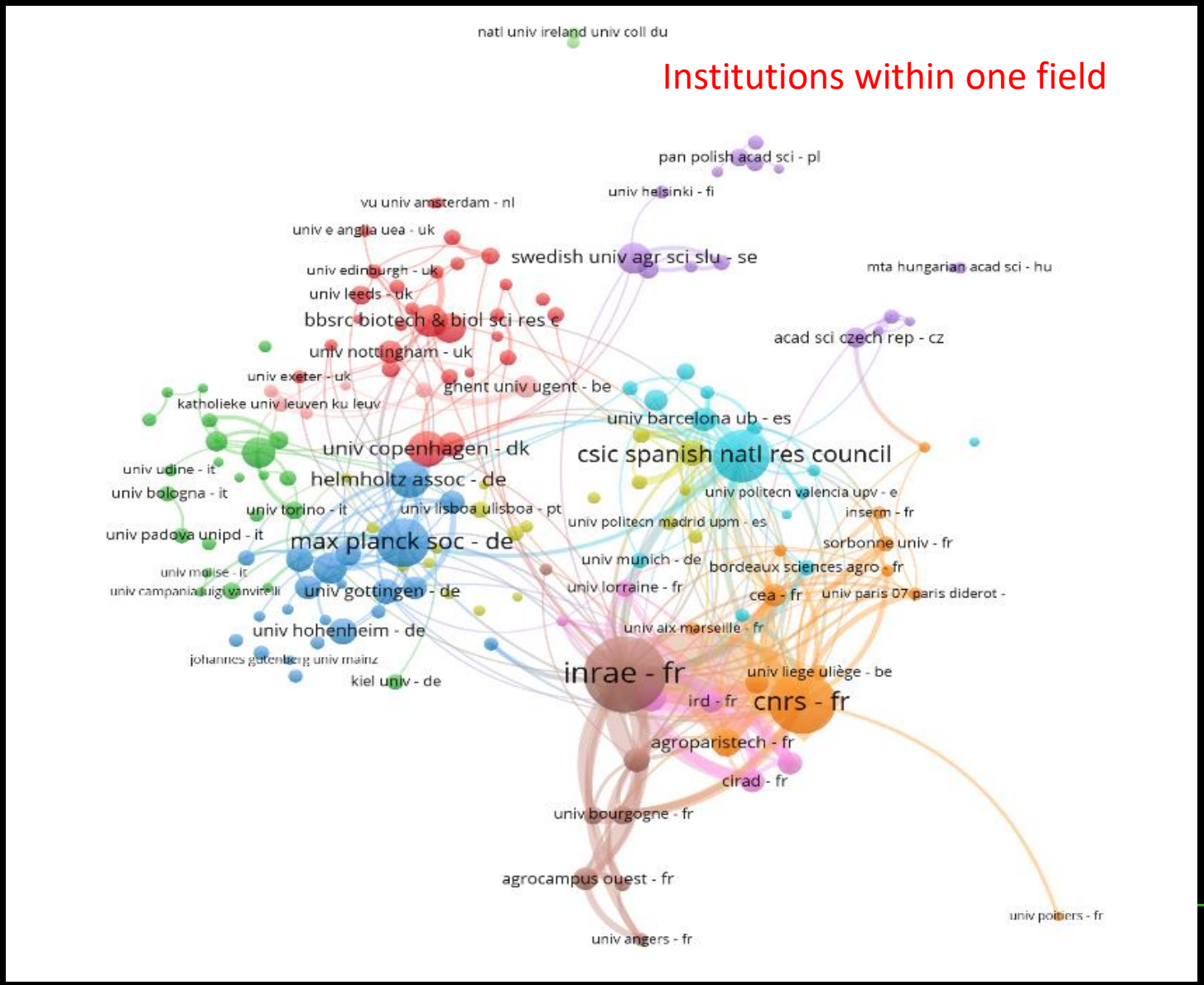
Collaborations of the main institutions (which have at least 200 publications)

The links shown correspond to a minimum of 10 co-publications between the institution and its partner



Note that the literature screening performed in WP4 is more comprehensive (*e.g.* institutions from Spain, Portugal, Greece, Poland, Denmark, Austria, Sweden…), when compared to the interaction network derived from the database produced in

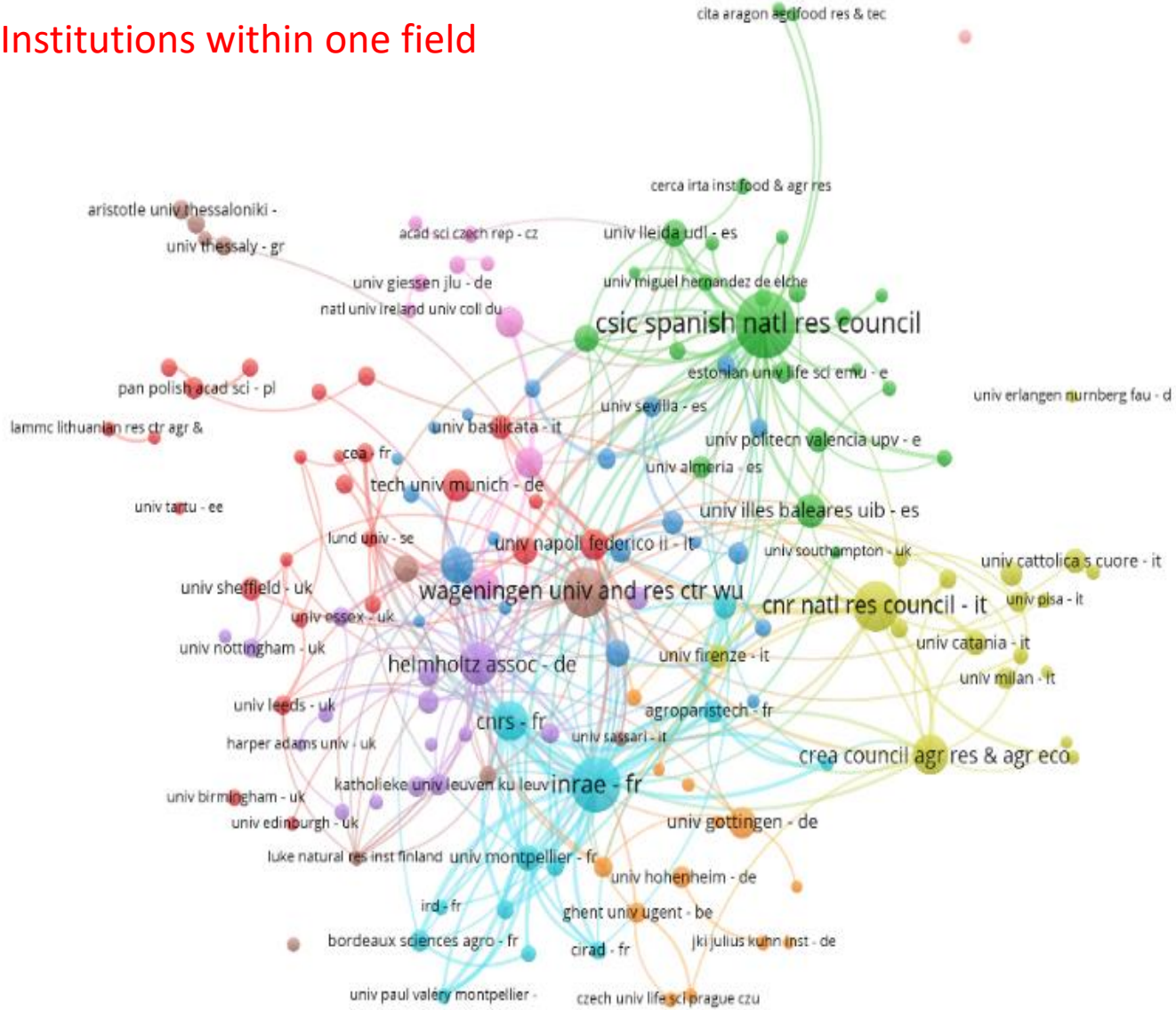
UE28 institutions with other UE Institutions within a field
e.g. Nutrient-metabolism-transport
(threshold: 5 occurrences, links> 1)



Relative impact of UE Institutions and their interactions within a specific field

UE28 institutions with other UE Institutions within a field
e.g. Water Use Efficiency
(threshold: 5 occurrences, links> 1)

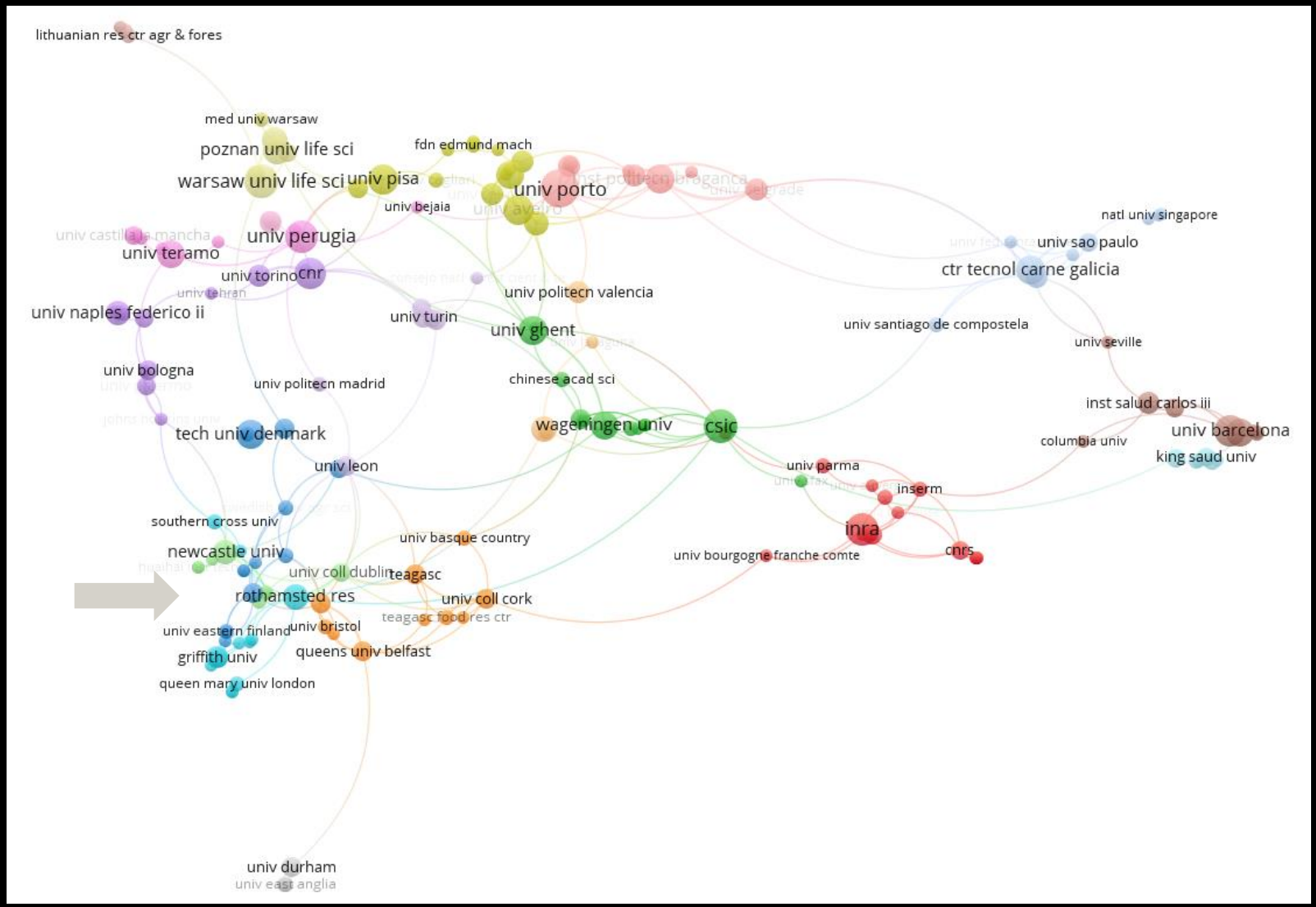
Institutions within one field



Relative impact of UE Institutions and their interactions within a specific field

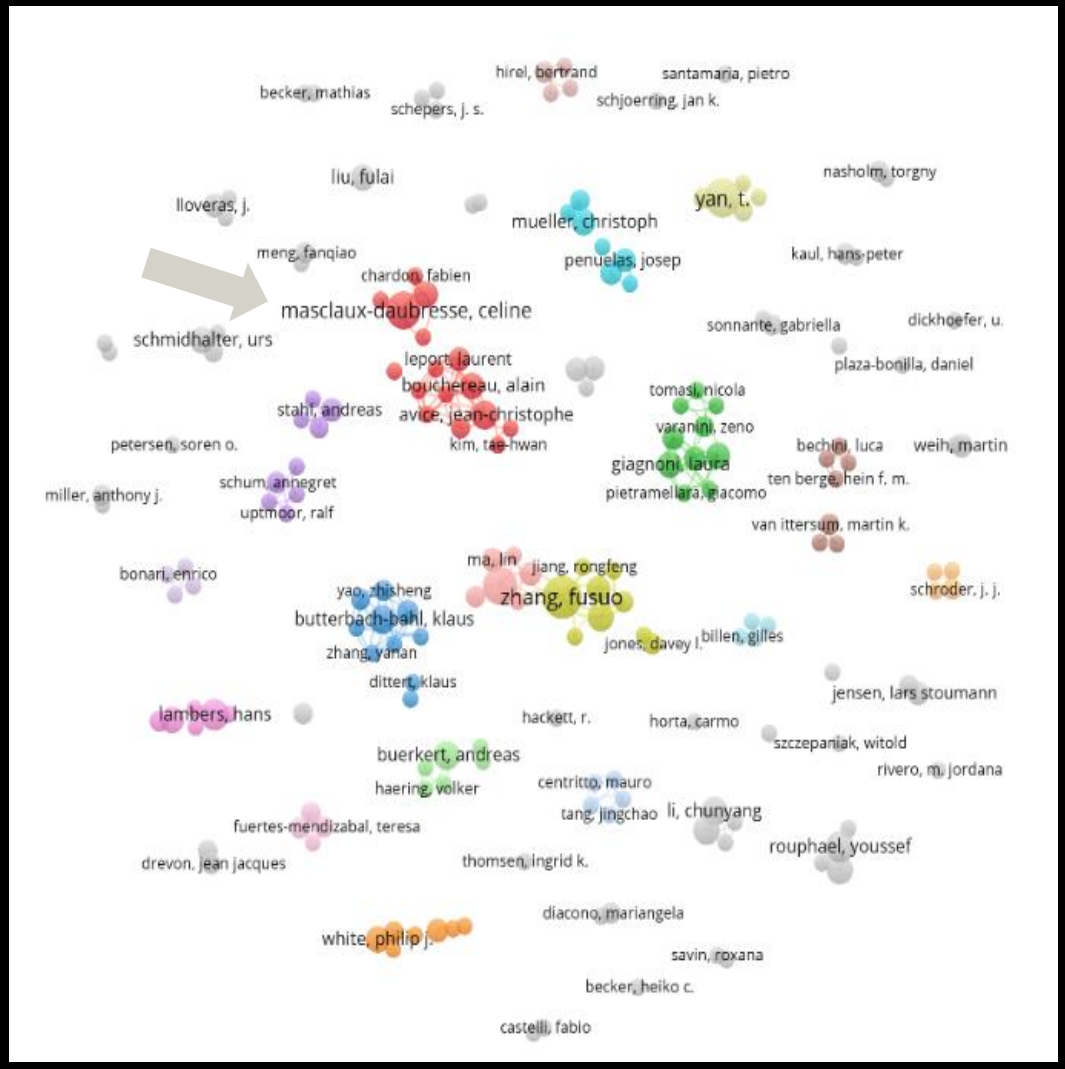
- ***Nutritional quality: Fatty acids – Omega3***

Main institutions and their interactions in the field ***"Fatty acids – Omega3"***



Contacted Focus group coordinator

Mains actors in a specific field and their interactions
e.g. Nutrient use efficiency
(threshold: 2 occurrences, links> 1)

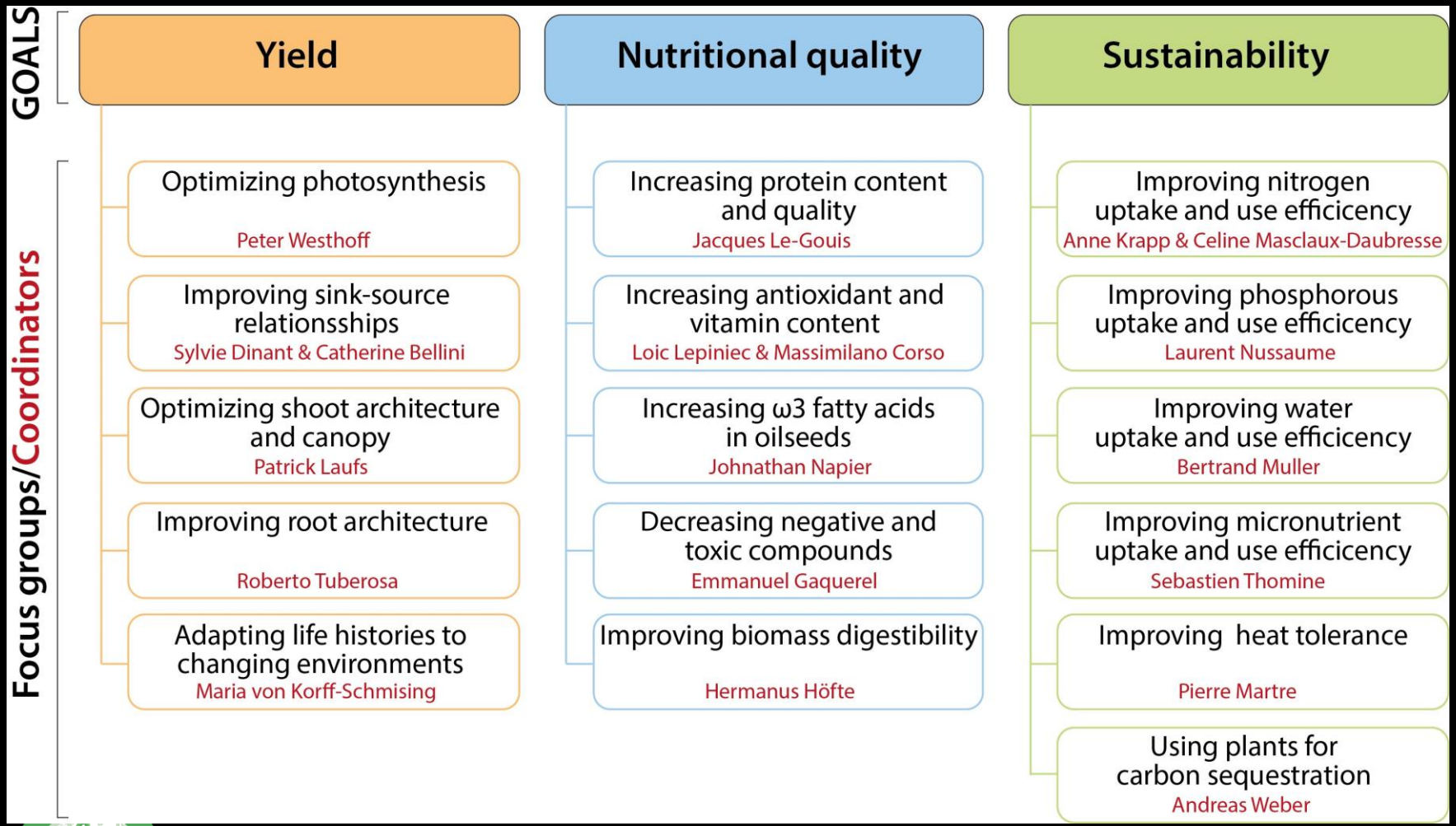


Contacted
Focus group
coordinator

Main actors within a field: lack of interaction in this field?

Focus groups & their coordinators

(According to WP1, WP2, and literature screening in WP4)



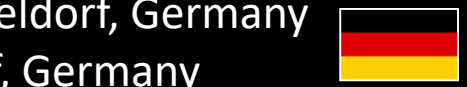
Major Players in Private-Public-Partnerships inside EU countries

- Applied Research communities (Private companies, R&D services of Cooperatives, Technical Institutes, networks of Experimental Stations etc.).

Method:

- Screening of the scientific production (**WoS**) during **five years (2015-2019)** (funding e.g. REMIX – H2020 – 727217, BACI – H2020 – 640176, FACCE SURPUS – H2020 – 652614, GoodBerry – H2020 – 679303, MycoKey – H2020 – 678781, PAPETS - FP7 – 323901, Innovine - FP7 – 311775, Watbio - FP7 – 311929…)
- List of actors coming from the biotechnology industries also inventoried using available **lists of previously funded projects by EU, DFG, ANR… + GABI** funded projects in Germany, **Biovegen** projects in Spain, private companies involved in the French Investments for the Future (**PIA**), private partners of the **French GIS-BV** (public private partnership for plant biotechnologies)…

Günter Strittmatter, Heinrich-Heine-Universität Düsseldorf, Germany
Peter Westoff, Heinrich-Heine-Universität Düsseldorf, Germany
Francesco Loreto, CNR, Roma, Italy
Erik Murchie, UNOTT, Nottingham, UK
Rene Klein Lankhorst, WUR, Wageningen, NL
Pablo Vera, IBMCP CSIC, Valencia, Spain
Gonzaga Ruiz de Gauna, Biovegen, Madrid, Spain
Peter Rogowsky, INRAE, Lyon, France
Norbert Rolland, INRAE/CNRS, Grenoble, France
Mathias Pribil, Univ. Copenhagen, Denmark







Major Players in Private-Public-Partnerships:

Inside Germany, and interaction of German PPPs with EU countries

1 Germany/Private Sector

- KWS SAAT SE & Co. KGaA
- Saaten Union Biotec GmbH
- BASF SE
- Norddeutsche Pflanzenzucht Hans Georg Lembke KG
- Bayer CropScience AG
- Nordasaat Saatzuchgesellschaft mbH

1 Germany / Public Sector

- Leibniz-Institut für Pflanzengenetik u. Kulturpflanzenforschung Gatersleben
- MPI f. Pflanzenzüchtungsforschung Köln
- MPI f. mol. Pflanzenphysiologie Golm
- Heinrich-Heine-Universität Düsseldorf
- Justus-Liebig-Universität Gießen
- Georg-August-Universität Göttingen
- Forschungszentrum Jülich
- Universität Hohenheim
- Christian-Albrechts-Universität zu Kiel
- Martin-Luther Universität Halle-Wittenberg

Major Players in Private-Public-Partnerships:

Inside France, and interaction of French PPPs with EU countries

2 France / Private Sector

- Bayer CropScience
- BASF SE
- Vilmorin
- Limagrain
- Innolea
- RAGT Semences
- Florimond Desprez
- Momont / KWS France
- Euralis/Caussade
- Syngenta
- Gautier Semences
- MAS Seeds
- Agri Obtentions
- Secobra
- Danone
- Nestlé
- Roquette
- Vegenov BBV

- Arvalis
- Vegepolys Valley
- Terres Inovia
- Sofiproteol
- Gnis

2 France / Public Sector

- **INRAE**
- **CNRS**
- **Cirad**
- **CEA**
- **IRD**
- **Institut Agro**
  (fusion of SupAgro and AgroCampusOuest in Montpellier)
- **Université Paris-Saclay**
  (incl. AgroParisTech + Université Paris-Sud)

Etc...

Public-Private-Partnerships in Europe: Summary

- Intensively used system in F, D, NL, DK, E, I, GB, B
- Strong interactions F/D, F/NL, F/E, NL/D, B/NL, D/GB, GB/NL, D/I, I/NL
- Independent organizations for steering in E and DK
- Major players visible in all countries, at public and at private level

Work package 4: International Cooperation [Months: 1-36]
INRAE, WR, VIB, WU, CNR, EPSO, UDUS, UNOTT, CNRS, UCPH, ULANC, USAMV CLUJ, ESA, ACTA

Task 4.1. This task aims to map the existing research communities using existing formal and informal EU networks **(M1-M18 ->M24).**
Task leader: UDUS; other partners: WR, VIB, CNR, EPSO, UNOTT, CNRS, UCPH, INRA, ULANC, USAMV, ESA, SORBONNE, ARVALIS

- Research communities (physiologists, geneticists, breeders, modellers, agronomists, socio-economists, pathologists, etc…) who are mostly coming from academic organisations (Research Institutes and Universities).

- Create a network model of existing or lacking interactions from the mapping of national or international communities and projects, and their distribution within Europe.

- Applied Research communities (Private companies, R&D services of Cooperatives, Technical Institutes, networks of Experimental Stations etc.).

- Selecting people from all partners at European level to assemble an expert panel (focus groups).




Work package 4: International Cooperation [Months: 1-36]
INRAE, WR, VIB, WU, CNR, EPSO, UDUS, UNOTT, CNRS, UCPH, ULANC, USAMV CLUJ, ESA, ACTA

Task 4.2. This task aims to link research communities identified during task 4.1 by organizing joint meetings betweeen plant scientists **(M12-M24 ->M28).**
Task leader: INRAE; other partners: WR, VIB, WU, CNR, EPSO, UDUS, UNOTT, JKI, CNRS, UCPH, ULANC, USAMV, ACTA, ESA

- Organize networking activities with the different Research communities to identify experts for sustainable improvement of crop yield, and nutritional quality (link with WP1).

- Organize a joint meeting between European plants scientists from different disciplines and ongoing research programs to inventory areas of sustainable improvement of crop yield, and nutritional quality.

- Assemble an expert panel to review strategies (see task 4.3)

Focus groups meetings

WP4 meeting June 2021

Focus groups reports and reviews

Focus Groups: Tasks of Coordinators

1. **Gathering a team of experts**

● Organize networking activities with the different Research communities

The coordinators of the 16 "Focus Groups", established contacts with an average of 9 experts per "Focus Group". Altogether, this approach involved more than 130 experts, from 70 institutes or universities and 15 countries.

2. **Report (end of January 2021)**

- Status quo of research in the field
  - Current know-how
  - Most relevant latest research results
  - Trends in research, new technology applied or potentially applicable
- Future challenges in the field to be addressed with high priority
  - What are the most relevant unsolved questions (questions scientific questions, societal and economic challenges)
  - Aspects/opportunities for application of research results
- Action points for a future research program in the field
  - What needs to be done to solve the scientific questions and to meet the societal and economic challenges ?
  - Projects with application relevance
  - What needs to be done to support the translation of research results into societal and economic value?

3. **Presentation/discussion of report at Versailles-Meeting (8-9 June2021)**

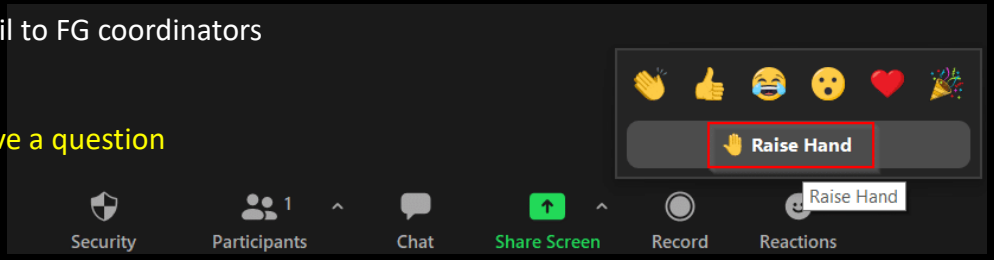
● Organize a joint meeting between European plants scientists from different disciplines

4. **Coming to a joint proposal of action points adjusted between all Focus Goups**

WP4 meeting: how to proceed

Presentations of Focus Groups

- 30 minutes allocated to Focus groups
- Suggestions for optimization of the reports should be sent by mail to FG coordinators
- A final version of the FG report will be diffused after the meeting
- Raise your virtual hand (rather than writing in the chat) if you have a question



Break-up sessions

- **In order to help us identifying over-arching topics of the Focus Groups, we organized discussions in "break-up groups" (June 9, 11:30).**

- Topics to be discussed in the Break-up Groups:
- The **highlights** in the reports of the Focus Groups
- Identify/suggest **links between the topics of the Focus Groups**
- Identify/suggest **over-arching topics** of the Focus Groups with respect to:
  - ❖ common to all Focus Groups
  - ❖ priority and strategic relevance
- Identify **links to the "Green Deal" and the "Farm-to-Fork" strategy**
- Comments, suggestions… should be written in the chat (will be stored)

Next presentation Green Deal & Farm-to-Fork Strategies of the EU, Cesar Gonzalez, Euroseeds

Acknowledgements

Special thanks to:

Evelyne Barbin
Laurence Piguel
Christina Gacic

Peter Westhoff (UDUS)
Günter Strittmatter (CEPLAS/UDUS)

Task 4.1

- Dominique Fournier, INRAE, Montpellier, France
- Rene Klein Lankhorst, WUR, Wageningen, NL
- Francesco Loreto, CNR, Roma, Italy
- Jacqueline Martin-Laffon, CNRS, Grenoble, France
- Bertrand Muller, INRAE, Montpellier, France
- Erik Murchie, UNOTT, Nottingham, UK
- Philippe Nacry, INRAE, Montpellier, France
- Mathias Pribil, Univ. Copenhagen, Denmark
- Peter Rogowsky, INRAE, Lyon, France
- Norbert Rolland, INRAE/CNRS, Grenoble, France
- Gonzaga Ruiz de Gauna, Biovegen, Madrid, Spain
- Günter Strittmatter, Heinrich-Heine-Univ. Düsseldorf, Germany
- Pablo Vera, IBMCP CSIC, Valencia, Spain
- Peter Westoff, Heinrich-Heine-Univ. Düsseldorf, Germany

Task 4.2

- Catherine Bellini, INRAE, Versailles, France + UMEA Univ., Sweden
- Massimiliano Corso, INRAE, Versailles, France
- Sylvie Dinant, INRAE, Versailles, France
- Emmanuel Gaquerel, Univ Strasbourg, France
- Hermanus Höfte, INRAE, Versailles, France
- Anne Krapp, INRAE, Versailles, France
- Patrick Laufs, INRAE, Versailles, France
- Jacques Le-Gouis, INRAE, Clermont-Ferrand, France
- Loïc Lepiniec, INRAE, Versailles, France
- Pierre Martre, INRAE Montpellier, France
- Céline Masclaux-Daubresse, INRAE, Versailles, France
- Bertrand Muller, INRAE, Montpellier, France
- Johnathan Napier, Rothamsted, UK
- Laurent Nussaume, CEA, Cadarache, France
- Norbert Rolland, INRAE/CNRS, Grenoble, France
- Sébastien Thomine, CNRS, Gif sur Yvette/Paris Saclay, France
- Roberto Tuberosa, Univ Bologna, Italy
- Günter Strittmatter, Heinrich-Heine-Univ. Düsseldorf, Germany
- Maria von Korff-Schmising, Heinrich-Heine-Univ. Düsseldorf, Germany
- Andreas Weber, Heinrich-Heine-Univ. Düsseldorf, Germany
- Peter Westoff, Heinrich-Heine-Univ. Düsseldorf, Germany

and > 100 other members of Focus Groups