



TRansition paths to sUustainable
legume-based systems in EEurope

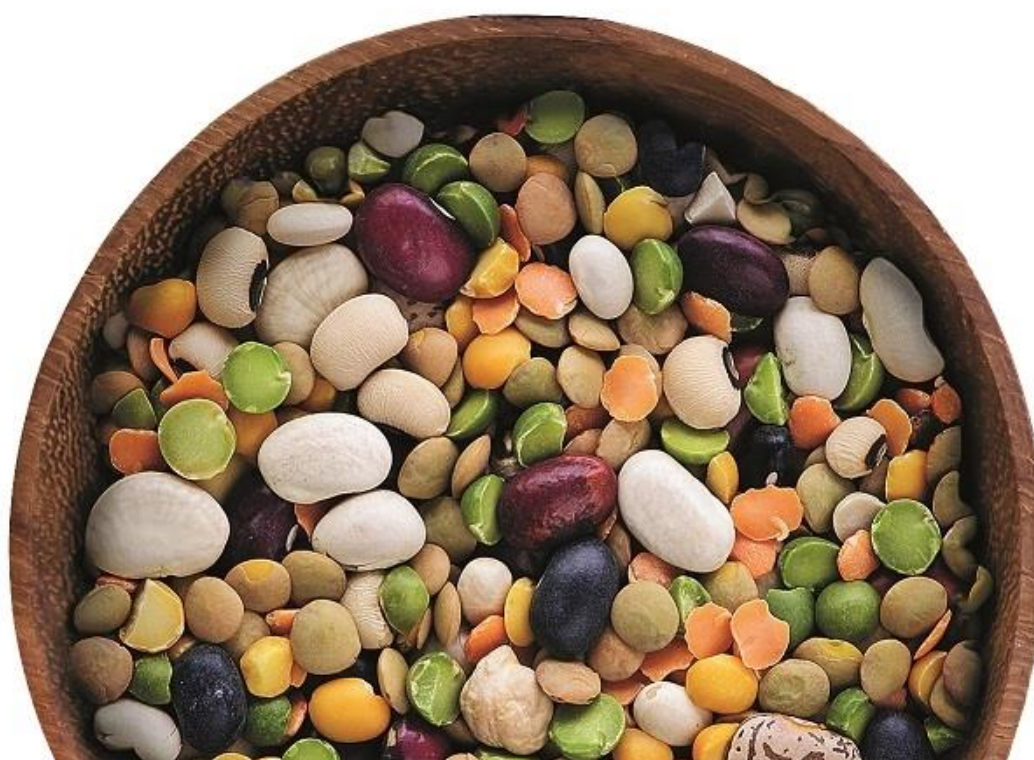
Scientific, Practice and Policy Publications, Year 4

Work Package: 1

Deliverable (D): 1.7 (D7)

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www.true-project.eu



Deliverable Description & Contributors

- **Due date:** 30st September 2021
- **Actual submission date:** 30st September 2021
- **Project start date:** 1st April 2017
- **Duration:** 54 months
- **Work package:** Knowledge Exchange and Communication (WP1)
- **Work package leader:** Carolin Callenius (UHOH)
- **Deliverable Title:** Scientific, practice and policy publications, Year 4
- **Nature of deliverable:** Report
- **Dissemination level:** PU, Public
- **Deliverable description:** Annually, data and key outputs/deliverables are gathered by WP1 and synthesised into practical briefing media such as notes for stakeholders, to inform members of the public of new insight and products via press releases, including trade press. These will be circulated in a range of languages of the Regional Clusters and will also be aimed to policymakers at regional, national and EU level.
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- **Key Words**

Knowledge Exchange; Communication; Dissemination; Deliverable; Impact.





Content

Deliverable Description & Contributors	2
Content.....	4
List of tables.....	6
Summary	7
Lists of communication and knowledge exchange activities.....	8
Scientific peer-reviewed publications	8
Scientific publications (non-peer-reviewed)	11
Organized sessions.....	12
Oral and poster presentations	13
Blog posts on the TRUE website	16
Press releases and media uptakes.....	17
Newsletter.....	20
Social media	20
Facebook.....	20
Twitter.....	22
Public Deliverables.....	25
European Legume Innovation Network (ELIN) workshops.....	26
Annexes	28
Annex 1: Stakeholder events (<i>excluding ELINs</i>)	28
Annex 2: Public events.....	29
Annex 3: Workshops attendance.....	30
Annex 4: TRUE partner social media activities	31
Annex 5: TRUE partner project subpages	33
Annex 6: Background to the TRUE-project	34
Executive Summary	34
Work-package structure	35
Project partners	36
Objectives	37
Legume Innovation Networks.....	38
Acknowledgement	39





Disclaimer	39
Copyright	39
Citation	39





List of tables

Table 1. List of scientific peer-reviewed publications during the 4 th project year..	8
Table 2. Other scientific publications during the 4 th project year.....	11
Table 3 Organised sessions. Year 4.....	12
Table 4. Oral presentations and posters by TRUE partners during the 4 rd project year.....	13
Table 5. Blog posts on the TRUE website, Year 4.	16
Table 6. List of press releases and media uptakes made by TRUE partners, Year 4.	17
Table 7. Examples of Facebook posts (past 6 months only).	21
Table 8. List of tweets made <i>via</i> Twitter by project partners (last 6 months only).	22
Table 9. Publicly available Deliverables of Year 4, available on the project website.....	25
Table 10. TRUE ELIN stakeholder workshops in project year 4.	26
Table 11. Stakeholder events (co-)organised by TRUE members in project year 4(<i>non-exhaustive list</i>).	28
Table 12. Public events organised by/with contributions from TRUE members in project year 4 (<i>non-exhaustive list</i>).	29
Table 14. TRUE partner social media activities, Year 3 (<i>non-exhaustive list</i>).....	31
Table 15. List of TRUE partner project subpages referring to the project and its website (<i>non-exhaustive list</i>).....	33



Summary

During the fourth year of the TRUE project, multiple and complementary knowledge sharing, and communication activities were carried out to disseminate the results of the work packages. To cope with the constraints of the COVID-19 pandemic, partners had to learn and adapt to new innovative ways of connecting with each other and with external stakeholders.

As it is the last period of the project, communication activities focused on the publication of scientific results (22 peer-reviewed publications and 7 other scientific publications), diffusion within the scientific community (1 organised session and 23 oral presentations), communication with the general public (31 media captures and press releases), activities through the TRUE website and project social media channels (13 blog posts and 218 social media posts), spread of scientific results to the practice community (publication on the website of 30 Practice Abstracts and 12 new public Deliverables) and policy-oriented outreach activities (1 organised session, publication of 4 policy briefs).

An important outcome to link stakeholders along the value chain is the LIN workshops that took place in the three geographical regions (Atlantic, Continental, and Mediterranean) in an online format. In May 2021, the Legume Innovation Network (LIN) was launched during a series of eight legume webinars entitled, "*European Legumes in Transition*", organised by the EU H2020 legume projects LegValue and TRUE.

This report provides the details of the scientific, practice and policy publications mentioned previously. Most of the contributions listed include internet links, when available. Following the principles of Open Science, all the deliverables are available in the [TRUE open access repository Zenodo](#).



Lists of communication and knowledge exchange activities

The following tables present the broad diversity of knowledge exchange, communication, and outreach activities of the TRUE project, which were undertaken by its partners during its fourth year. Wherever possible, a web-link to the original material or source is provided.

Scientific peer-reviewed publications

Scientific peer reviewed publications include those which have been published and can be found using the digital object identifier (DOI).

Table 1. List of scientific peer-reviewed publications during the 4th project year. Lead partner named first.

Date	Title	Authors	Partner	Link
March 2020	Factors determining the spatial distribution of grain legume cultivation in the EU (p. 293-308)	Oré Barrios C.; Mäurer E.; Lippert C.	UHOH	https://gewisola.de/files/GeWiSoLa_Bd55_2020.pdf
22 March 2020	Legume biofortification and the role of plant growth-promoting bacteria in a sustainable agricultural era	Roriz, M.; Carvalho, S.M.P.; Castro, P.M.L.; Vasconcelos, M.W.	UCP	doi.org/10.3390/agronomy10030435
01 April 2020	The effect of sprouting in lentil (<i>Lens culinaris</i>) nutritional and microbiological profile	Santos, C.S., Silva, B., Valente, M.P.L., Gruber, S., Vasconcelos, M.W. (2020).	UCP UHOH	doi.org/10.3390/foods9040400
8 June 2020	Regional land use efficiency and nutritional quality of protein production	Leinonen I.; Iannetta P.P.M.; MacLeod M.; Rees R.M.; Russell W.; Watson C.; Barnes A.P.	SRUC JHU	doi.org/10.1016/j.gfs.2020.100386
25 June 2020	Substituting wheat with chickpea flour in pasta production delivers more nutrition at a lower environmental cost	Saget, M.C.; Barilli E.; Vasconcelos M.W., Santos, C.S., Styles, D., Williams, M.,	TCD; BU, SOL, UCP	doi.org/10.1016/j.spc.2020.06.012
02 July 2020	The biology of legumes and their agronomic, economic, and social impact (Book chapter)	Vasconcelos, M.P., Grusak, M.A., Pinto, E., Gomez, A., Ferraira, H., Balázs, B., Centofanti, T., Ntatsi, G., Savvas, D., Karkanis, A., Williams, M., Vandenberg, A., Toma, L., Shrestha, S., Akaichi, F., Oré Barrios, C., Gruber, S., James, E.K., Maluk, M., Karley, A., Iannetta, P.	UCP ESSRG AUA TCD SRUC UHOH JHI	doi.org/10.1007/978-981-15-4752-2_1
14 July 2020	Which agronomic practices increase the yield and quality of common bean (<i>Phaseolus</i>	Ntatsi, G.; Karkanis, A.; Tran, F.; Savvas, D.; Iannetta, P.P.M	AUA JHU	doi.org/10.3390/agronomy10071008



Date	Title	Authors	Partner	Link
	<i>vulgaris</i> L.)? A systematic review protocol			
21 Aug 2020	Utilization of low nitrogen barley for production of distilling quality malt	Black K.; Daute M.; Tziboula-Clarke A.; White P.J.; Iannetta P.M.; Walker G.	ADL, JHU	doi.org/10.1080/03610470.2020.1796090
22 August 2020	Representing crop rotations in life cycle assessment: a review of legume LCA studies	Costa, M.P., Chadwick, D., Saget, S., Rees, R.M., Williams, M. and Styles, D.	BU, SRUC, TCD	doi.org/10.1007/s11367-020-01812-x
27 August 2020	Comparative assessment of different crop rotation schemes for organic common bean production	Karavidas, I.; Ntatsi, G.; Ntanasi, T.; Vlachos, I.; Tampakaki, A.; Iannetta, P.P.M.; Savvas, D.	AUA JHU	doi.org/10.3390/agronomy10091269
30 October 2020	Pulse consumption among Portuguese adults: potential drivers and barriers towards a sustainable diet	Duarte, M.; Vasconcelos, M.; Pinto, E.	UCP	doi.org/10.3390/nu12113336
2020	Health benefits of pulse consumption – An overview	Ferreira H.; Vasconcelos M.W.; Gil A.M.; Pinto E.	UCP	https://www.teknoscienze.com/tks_article/health-benefits-of-pulse-consumption-an-overview/
25 December 2020	Reviving a neglected crop: a case study on lentil cultivation in Germany	Reif, T.M.; Zikeli, S.; Rieps, A.-M.; Lang, C.P.; Hartung, J.; Gruber, S.	UHOH	doi.org/10.3390/su13010133
28 December 2020	Optimised processing of faba bean kernels as a brewing adjunct	Black K.; Tziboula-Clarke A.; White P.J.; Iannetta P.M.; Walker G.	ADL, JHU	doi.org/10.1002/jib.632
7 January 2021	Agroecological practices for whole-system sustainability	Hawes, C.; Iannetta, P. P. M.; Squire, G. R.	JHU	10.1079/PAVSNNR202116005
28 February 2021	Substitution of beef with pea protein reduces the environmental footprint of meat balls whilst supporting health and climate stabilisation goals	Saget, M.C.; Costa M.; Santos, C.S.; Vasconcelos M.W.; Gibbons J.; Styles, D.; Williams, M.	TCD; BU, UCP	doi.org/10.1016/j.jclepro.2021.126447
28 February 2021	Integrated policy analysis to identify transformation paths to more-sustainable legume-based food and feed value-chains in Europe	Balázs, B.; Kelemen, E.; Centofanti, T.; Vasconcelos, M.W.; Iannetta, P.P.M.	ESSRG UCP JHU	doi.org/10.1080/21683565.2021.1884165
13 April 2021	Legume-modified rotations deliver nutrition with lower environmental impact	Costa M.P.; Reckling M.; Chadwick D.; Rees R. M.; Saget S.; Williams M.; Styles D.	BU SRC TCD	doi.org/10.3389/fsubs.2021.656005
30 April 2021	Effect of nutritional variation and LCA methodology on the carbon footprint of milk	March M.D., Hargreaves P.R.; Sykes A. J.; Rees R.M.	SRUC	doi.org/10.3389/fsubs.2021.588158





Date	Title	Authors	Partner	Link
	production from Holstein Friesian dairy cows			
7 July 2021	Policy interventions promoting sustainable food- and feed-systems: a Delphi study of legume production and consumption	Balázs, B.; Kelemen, E.; Centofanti, T.; Vasconcelos, M.W.; Iannetta, P.P.M.	ESSRG UCP JHU	doi.org/10.3390/su13147597
19 July 2021	Comparative life cycle assessment of plant and beef-based patties, including carbon opportunity costs	Saget, M.C.; Costa M.P.; Santos, C.S; Vasconcelos M.W; Gibbons J.; Styles, D.; Williams, M.	TCD; BU, UCP	doi.org/10.1016/j.spc.2021.07.017
23 July 2021	A multifunctional solution for wicked problems: value-chain wide facilitation of legumes cultivated at bioregional scales is necessary to address the climate-biodiversity-nutrition nexus.	Iannetta P. P. M.; Hawes C.; Begg G.S.; Maaß H.; Ntatsi G.; Savvas D.; Vasconcelos M.; Hamann K.; Williams M.; Styles D.; Toma L.; Shrestha S.; Balázs B.; Kelemen E.; Debeljak M.; Trajanov A.; Vickers R.; Rees R. M.	JHU UHOH AUA UCP IFAU TCD BU SRUC ESSRG JSI IPGRO	doi.org/10.3389/fufs.2021.692137



Scientific publications (non-peer-reviewed)

Scientific work which has been presented or submitted but not yet published are presented in this table.

Table 2. Other scientific publications during the 4th project year.

Date	Title	Authors	Partner	Link
31 January 2021	The effect of diets based on plant protein sources on Atlantic Salmon in RAS aquaculture	Meyer zu Westerhausen, M	AWI	(Master thesis)
April 2021	Greenhouse gas emissions: A dairy systems approach	March, M.D., Hargreaves, P.R., Rees, R.M., Sykes, A.J.	SRUC	Forthcoming
26 February 2021	The biodiversity of <i>Rhizobium leguminosarum</i> in Eastern Spain	Fernando-Molina, F., Maluk, M., James, E.K., Iannetta, P.P.M.	JHI	Undergraduate student project
September 2021	Impact of conventional and organic farming practices on yield and quality of fresh common bean pods.	Karavidas I., Ntatsi G., Marka S., Ntansi T., Sabatino L., Savvas D.	AUA	Forthcoming
September 2021	Responses of biological N fixation of common bean to different N fertigation schemes combined by root inoculation with rhizobia.	Karavidas I., Ntatsi G., Ntansi T., Tampakaki A., Iannetta P.M., Savvas D.	AUA	Forthcoming
September 2021	Impact of different rootstocks on common bean cultivated under saline conditions	Vougeleka V., Ntatsi G., Tampakaki A., Iannetta P.M., Saitanis C., Savvas D.	AUA	Forthcoming
September 2021	Effect of grafting on yield and biological nitrogen fixation of greek landraces of common bean	V. Vougeleka, G. Ntatsi, F. Mylona, A. Tampakaki, C.J. Saitanis, D. Savvas	AUA	Forthcoming
September 2021	Impact of different rootstocks on common bean cultivated under drought stress	Vougeleka V., Ntatsi G., Tampakaki A., Saitanis C., Savvas D.	AUA	Forthcoming



Organised sessions

TRUE partners led sessions, including several scientific presentations, within a broader event. During the 4th year TRUE results were presented in two important events: European Green Week and 16th Congress of the European Association of Agricultural Economists.

Table 3 Organised sessions - Year 4.

Date	Title	Event	Partner	Link
26-05-2020	<i>Legumes' role post-COVID-19: reorienting the focus of policy on legume-based food and feed system</i>	<i>European Green Week</i>	<i>ESSRG; UHOH; JHU</i>	link
26-05-2020	Novel food innovations	European Green Week	UCP	link
26-05-2020	New plates old beans!	European Green Week	AK	link
26-05-2020	Just the tonic!	European Green Week	ADL	link
26-05-2020	Winning the market	European Green Week	IFAU	link
26-05-2020	Sustainable Food Products	European Green Week	TCD	link
22-07-2021	<i>Legumes and their economics</i>	<i>16th Congress of the European Association of Agricultural Economists</i>	<i>SRUC</i>	link
22-07-2021	Determinants of farmers' uptake of legumes – a structural equation modelling approach	16th Congress of the European Association of Agricultural Economists	SRUC, UHOH, JHU	link
22-07-2021	UK consumers' preferences and willingness to pay for pulse-based meat substitutes	16th Congress of the European Association of Agricultural Economists	SRC	link
22-07-2021	Life Cycle Analysis (LCA) of Novel Legume Products	16th Congress of the European Association of Agricultural Economists	TCD, BU, UCP	link
22-07-2021	Feed Legumes and Carbon Efficiency of Dairy Systems	16th Congress of the European Association of Agricultural Economists	SRC	link
22-07-2021	Economics of legumes	16th Congress of the European Association of Agricultural Economists	UHOH	link





Oral and poster presentations

During 2020 and 2021, TRUE partners participated in several on-line events of the scientific community as oral or posters presenters.

Table 4. Oral presentations and posters by TRUE partners during the 4th project year.

Date	Title	Event	Speaker and contributors	Partner	Link	Category
4 April 2020	Legume - rhizobia technology demonstration	Legume - rhizobia technology KEFRI Lab demonstration to Chuka University undergraduate students		KEFRI		Scientific and Practice
2 July 2020	Cropping pulses to maximise gross margins and ecosystem functions	Arable Scotland 2020 event	Iannetta, P.P.M.	JHI	Link	Scientific and Practice
6-9 October 2020	Climate neutral food: the pivotal role for legumes	EC meeting: Climate neutral food (and wood): Showcasing best climate practices in agriculture, forestry, food systems and the bioeconomy	Iannetta, P.P.M.	JHI	Link	Scientific and Practice
13 October 2020	Legume-Modified Rotations Deliver Nutrition with Lower Environmental Impact	12th International Conference on Life Cycle Assessment of Food	Costa M.P.; Reckling M.; Chadwick D.; Rees R.M; Saget S.; Williams M. and Styles D.	BU TCD SRUC	Link	Scientific and Practice
29 October 2020	Plant proteins and business cases - what can we learn from other countries (in Danish)	Network meeting - Danish network for plant proteins	Hamann K.	IFAU		Scientific and Practice
3- 4 November- 2020	Impact of different crop rotation schemes on biological nitrogen fixation, N availability and yield in common bean grown for fresh pod production	28th International Symposium of CIEC the International Scientific Centre for Fertilizers	Karavidas J., Ntatsi G., Ntansi T., Vlachos I., Tampakaki A., Iannetta P.P.M., Savvas D.	AUA JHI	Link	Scientific and Practice
20 November 2020	Development of decision support systems for application in agronomy	invited talk, L'Unité de Mathématiques et Informatique Appliquées de Toulouse; France	M. Debeljak	JSI	Link	Scientific and Practice





Date	Title	Event	Speaker and contributors	Partner	Link	Category
26 November 2020	A national protein plan: a step towards 'ecological food- and feed-systems'	Zero Waste Scotland: the future of food	Iannetta, P.P.M.	JHI	Link	Scientific and Practice
10 December 2020	Podcast: legume-based systems and breeding	Interview/podcast by Plant Breeding Services International	Iannetta, P.P.M.	JHI	Link	Scientific and Practice
17 December 2020	Gin research and education at Abertay	Institute of Brewing & Distilling webinar series	Black K, Walker G.	ADL		Scientific and Practice
18 January 2021	Tephrosia fallow enhances grain yield of maize-common bean intercrops: Results from a demonstration trial in western Kenya	Intercropping for sustainability: research developments and their application. Association of Applied Biologists Conference	Odee, D., Makatiani, M., Otieno, J., Esitubi, M., Kinyanjui, M., Magare, C.	KEFRI	Link	Scientific and Practice
27 January 2021	CAWR MSc student training - virtual tour of experimental plots	CAWR MSc	Rayns F.	CU		Scientific and Practice
02 February 2021	Development of decision support systems for application in agronomy	Invited talk, Ljubljana School of Business, Slovenia	M. Debeljak	JSI		Scientific and Practice
25 February 2021	Give peas a chance: legumes and the sustainable development of Scotland's food & drink industries	University of Reading Environmental Science webinar series	Black K.	ADL		Scientific and Practice
23 March 2021	Give peas a chance: legumes and the sustainable development of Scotland's food & drink industries	IFST Scotland Branch Event - Net Zero Gin, low carbon food production. Making more with less.	Black K.	ADL	Link	Scientific and Practice
30 March 2021	Factors influencing uptake of legumes in Scotland	The Annual Conference of The Agricultural Economics Society	Toma, L., Akaichi, F., Shrestha, S., Barnes, A., Iannetta, P.	SRUC, JHI	Link	Scientific, Practice, Policy





Date	Title	Event	Speaker and contributors	Partner	Link	Category
30 March 2021	Methodology for building decision support systems in the agri-food sector	Invited talk, Research Institute for Organic Agriculture (FiBL), Switzerland	M. Debeljak	JSI		Scientific and Practice
01 July 2021	Promising Pulses	Arable Scotland	Iannetta, P.P.M.	JHI	Link	Scientific, Practice, Policy
24-26 September 2021	Impact of the preceding crop on soil nitrogen availability and fresh pod production in an organic crop of common bean grown in open field	International Society for Horticultural Science- VIII South-Eastern Europe Symposium on Vegetables and Potatoes	Karavidas I., Ntatsi G., Ntanasi T., Vlachos I., Tampakaki A., Iannetta P., Savvas D.	AUA JHI	Link	Scientific and Practice
6-8 September 2021	Substituting traditional foods and beverages with innovative legume-based alternatives: a consequential life cycle assessment of diet change in Europe	Life Cycle Management Conference 6th-8th September 2021, online	Saget S.; Costa M.P.; Williams M.; Styles D.	BU TCD	Link	Scientific and Practice
6-8 September 2021	Environmental and land use consequences of introducing legumes into our diets	Life Cycle Management Conference 6th-8th September 2021, online	Costa M.P.; Saget S.; Zimmermann B.; Petig E.; Angenendt E.; Rees R.M.; Chadwick D.; Gibbons J. Shrestha S.; Williams M.; Styles D.	BU TCD UHOH SRUC	Link	Scientific and Practice
6 September 2021	Legumes as environmentally sustainable feedstocks for brewing and distilling fermentations	Worldwide Distilled Spirits Conference	Black K	ADL	Link	Scientific and Practice
23 September 2021	Can legumes solve the nitrogen problem?	14th European Nitrogen Fixation Conference	Rees, RM	SRUC	Link	Scientific and Practice





Blog posts on the TRUE website

The blog posts, “*Notes from the field*” include general project information, interviews, reports, case study descriptions and updates as well as work package updates. All blog posts published in Year 4 are listed below and are available online [here](#).

Table 5. Blog posts on the TRUE website, Year 4.

Date	Title	Category	Partner	Link
04 May 2020	Reducing costs through good clover management	Reports	TEAGASC	link
02 July 2020	Adding value: a central role for legumes	Videos	JHU	link
06 July 2020	Mowing mulches: a means for managing competition?	Case Study Reports	SRUC	link
07 July 2020	Incorporating white clover on cattle and sheep farms	Case Study Reports	TEAGASC	link
17 July 2020	TRUE ISAB interviews	Interviews	ISAB	link
12 August 2020	Show cooking at "Mercado de Bolhão"	Videos	UCP	link
08 September 2020	The daily (legume) bread	Work Package Updates	IGV	link
16 September 2020	Cooking together digitally: Disco soup	Work Package Updates	SF	link
02 September 2020	Legume cookbook for children	Case study reports	UCP UHOH	link
12 November 2020	Case Study Videos	Videos Case Study Report	WP2	link
15 February 2021	Choose Beans - certified sustainability	Case Study Report	EUR	link
01 March 2021	Research for policy recommendations	Work Package Updates	ESSRG	link
25 March 21	Legumes in podcast and presentation	Work Package Updates	JHU	link





Press releases and media uptakes

During the 4th year, some outputs of the project were highlighted as press releases or interviews in mass media. Examples of them are CORDIS, online papers (Irish Times, Scotsman, The Guardian Newspaper, The Conversation, Cosmos), networks of projects (ARC) or interviews (BBC radio). In this section we present those activities which are also available at TRUE website: [here](#) and [here](#).

Table 6. List of press releases and media uptakes made by TRUE partners, Year 4.

Date	Title	Authors, Contributors	Partner	Press	Link
April 2020	New studies show Irish diet is unsustainable – nutritionally, financially, and ethically	Williams M.; Saget S., Suttle M.; O'Driscoll B.; Cotter M.	TCD	Trinity Media Release	Link
17 April 2020	Irish diet unsustainable and causes nutritional, financial problems - study	Williams M.	TCD	The Irish Times	Link
18 April 2020	Including of TRUE in periodic Comment piece published by STC representative in the Yorkshire Post Saturday circulation	Branfield, L.	STC	Yorkshire Post publication (Comment piece in Saturday circulation insert)	
04 May 2020	Evaluating lupin seed meal in feeds for Pacific white shrimp	Weiss M., Rebelein A.; Slater M.J.	AWI	Global Sea Food Alliance	Link
01 June 2020	Pulse Magazine: Summer Edition: Pound Farm-home feeding beans: Alternatives for disease control: market prospects: Editorial policy observation	Roger Vickers: Becky Howard: jim Scrimshaw: Steve Belcher: Lea Herold	PGRO	Partner in house publication	Link
04 June 2020	Interview - EUREKA Project	Iannetta, P.P.M.	JHI	Online interview	Link
19 June 2020	Agriculture focus: Legumes contribute to a better world	Vickers R.	PGRO	Open Access Government	Link
27 August 2020	Climate-positive spirit family grows with Nàdar Vodka	Iannetta, P.P.M.	JHI	JHI Press release	Link





Date	Title	Authors, Contributors	Partner	Press	Link
28 August 2020	Nadar Vodka Launch - press release	Black, K. Stirling, J. Stirling, I	ADL		
28 August 2020	Nadar Vodka Launch	Black, K. Stirling, J. Stirling, I	ADL	Various e.g. The Scotsman	Link
17 September 2020	Nadar gin and vodka BBC Radio 4 Farming Today podcast	Black, K. Iannetta, P.P.M.	ADL	Farming Today-BBC Radio Vodka podcast BBC 17/09/2020	Link
01 December 2020	Pulse Magazine; Winter Edition; Market prospects; Descriptive List launch; :Soil Health: Pea populations; Powdery mildew control in peas	Roger Vickers: Becky Howard: jim Scrimshaw: Steve Belcher: Lea Herold	PGRO	Partner in house publication	Link
10 December 2020	Press release - LIN	Roger Vickers	PGRO		
January 2021	Press work for the cookbook	Slow Food	SF		Link
21 February 2021	National protein plans could benefit our health and the environment	Iannetta, P.P.M.	JHI	The Scotsman newspaper	Link
01 March 2021	Pulse Magazine; Spring Edition; Market prospect update; Intercropping update, disease control; Bees, beans and yield benefits; Legume Innovation Network	Roger Vickers: Becky Howard: jim Scrimshaw: Steve Belcher: Lea Herold	PGRO	Partner in house publication	Link
03 March 2021	Pulse crops are a 'no brainer' for Scotland	Iannetta, P.P.M.	JHI	The Scottish Farmer	Link
03 March 2021	Why Scottish growers are turning to eco-friendly pulses?	Iannetta, P.P.M.	JHI	The Scotsman Newspaper	Link
07 March 2021	Why Scottish growers are turning to eco-friendly pulses?	Iannetta, P.P.M.	JHI	The Scotsman newspaper	Link
07 March 2021	Why Scottish growers are turning to eco-friendly pulses?	Iannetta, P.P.M.	JHI	Technology times	Link
09 March 21	UK pulse growers invited to participate in Europe-wide legume initiative.	Vickers R.	PGRO	Partner in house publication	Link





Date	Title	Authors, Contributors	Partner	Press	Link
09 March 2021	Legumes in focus at new events	Vickers R.	PGRO	Fresh Produce Journal	Link
17 March 2021	Digital seminars pushing legume supported feed and food production in Europe	Vickers R.	PGRO	Feed Navigator	Link
23 March 2021	Why we should turn meatballs green – new research underlines significant environmental benefits	Saget, M.C.; Costa M; Santos, C.S; Vasconcelos M.W; Gibbons J.; Styles, D.; Williams, M.	TCD BU UCP	Trinity News and Events	Link
13 April 2021	Legume research gets flexitarian pulses racing with farming guidance	Porto M., Styles D.	BU	The Guardian Newspaper (UK)	Link
23 April 2021	Why the humble legume could be the answer to Europe's fertiliser addiction	Michael William, David Styles, Marcela Porto Costa	BU	The Conversation	Link
27 April 2021	Crop rotations with beans and peas offer more sustainable and nutritious food production	Marcela Porto, David Styles, Dave Chadwick	BU	Bangor University press release	Link
06 April 2021	More Legumes Please!	Balazs, B., Kelemen, E., Centofanti, T., Vasconcelos, M. W., & Iannetta, P. P.	ESSRG UCP JHU	ARC network	Link
13 April 2021	Advancing sustainable agriculture with legumes. Broad study shows benefits of rotating standard crops with beans and lentils.	Costa M.P.; Reckling M.; Chadwick D.; Rees R. M.; Saget S.; Williams M.; Styles D.		Cosmos	Link
21 April 2021	Letter From The Farm Welcome To The Herdade	Sendim, F.	FDM	ARC network	Link
28 April 2021	More legumes, better health and environment	Porto M., Styles D.	BU	CORDIS	Link





Newsletter

We send out a Newsletter to all subscribers and to stakeholders of the European legume value chains. Currently there are **284** subscribers receiving the newsletter. In Year 4, editions no. 5, 6 and 7 were published. Newsletters are available [here](#).

Social media

The TRUE project managed a Facebook, Twitter and ResearchGate. The social media accounts are managed and fed by UHOH regularly. Project partners also use social media channels to communicate about TRUE (see *Annex 4*).

Facebook

Activities of the TRUE project Facebook account may be found [here](#). There are currently 504 followers, and in the period of 01.04.2020 to 01.09.21 a total of 94 posts, reaching 3,041 people.

Results

Facebook Page reach ⓘ

3,041 ↑ 141.7%



Table 7. Examples of Facebook posts (past 6 months only).

Date	Post
10.09.2021	#HapPeanness is #HomeGrown - @TRUELegumes has been encouraging #GoodFoodCulture with a collection of amazing #EasyPeasy #LegumeRecipes for kids. Check them out here 📄 https://www.true-project.eu/2020/10/02/legume-cookbook-for-children/ Also available in several languages here: https://www.true-project.eu/publications-resources/recipes/translations-easy-peasy/ #HealthyDiets #CoolBeans #LoveLegumes
08.09.2021	📣 Attention, attention! Have you seen the many insights generated by @TRUELegumes? With only 1 month left to go, we will highlight some of our main insights/outputs. SO STAY TUNED! #TRUEProject #LoveLegumes #LocallyGrown 📄 https://www.true-project.eu/
06.09.2021	#HomeGrown #Legumes CAN offer the necessary multifunctional solution for 'wicked problems', The success of legumes demands #Innovation and #Sustainability #Leadership from across #ValueChains - engage newly forming @LegumeNetwork now. #TRUEProject https://www.true-project.eu/legume-innovation-network/
10.06.2021	Be part of the 14th European #NitrogenFixation Conference which will take place as an online event from 22nd September to 22nd October 2021, hosted by Aarhus University, Denmark. Registration deadline is the 27th June 2021. Register here: https://events.au.dk/enfc2021/signup
18.05.2021	Next week we will organise a online Policy Dialogue event which is also part of the #EUGreenWeek Partner Events. For more information and registration go to: https://www.true-project.eu/news-events/policy-dialogue-event/
06.05.2021	Last but not least: Next week the 8th webinar of our series will take place on 11th of May! Don't forget to register and become part of the #LegumeInnovationNetwork http://www.legvalue.eu/virtual-conference/ EU Food & Farming Roger Vickers
06.05.2021	Two very interesting webinar about legume sciences and policies have passed this week. Thanks to all speakers and panellists who share their innovations, projects, and experiences! #legumeinnovationnetwork Wageningen University & Research Roger Vickers European Commission SRUC http://www.legvalue.eu/virtual-conference/
29.04.2021	Next week - next webinar: The role of policy in the transition of #legumes production and consumption in Europe #LegumeInnovationNetwork http://www.legvalue.eu/virtual-conference/ EU Food & Farming Roger Vickers Wageningen University & Research ADAS Alma Mater Studiorum - Università di Bologna
29.04.2021	In our todays webinar we were focusing on #legume breeding Thanks to all speakers for their clear and interesting talks! A major take away is that there are already a huge number of European legume networks! Let's stay connected to push the boundaries on legume breeding! #legumeinnovationnetwork http://www.legvalue.eu/virtual-conference/ Terres Inovia Aura Hodmedod INRAE Roger Vickers
28.04.2021	Our webinar series continues next week! Join us! #LegumeInnovationNetwork EU Food & Farming Solace EU INRAE ZALF Leibniz-Zentrum für Agrarlandschaftsforschung SRUC NUI Galway Bangor University



Twitter

All Twitter activities of the TRUE project can be found on [here](#), where the project currently has 1,052 followers. In the period of report, 124 tweets were posted, and a total of 11,299 visits to the profile recorded.

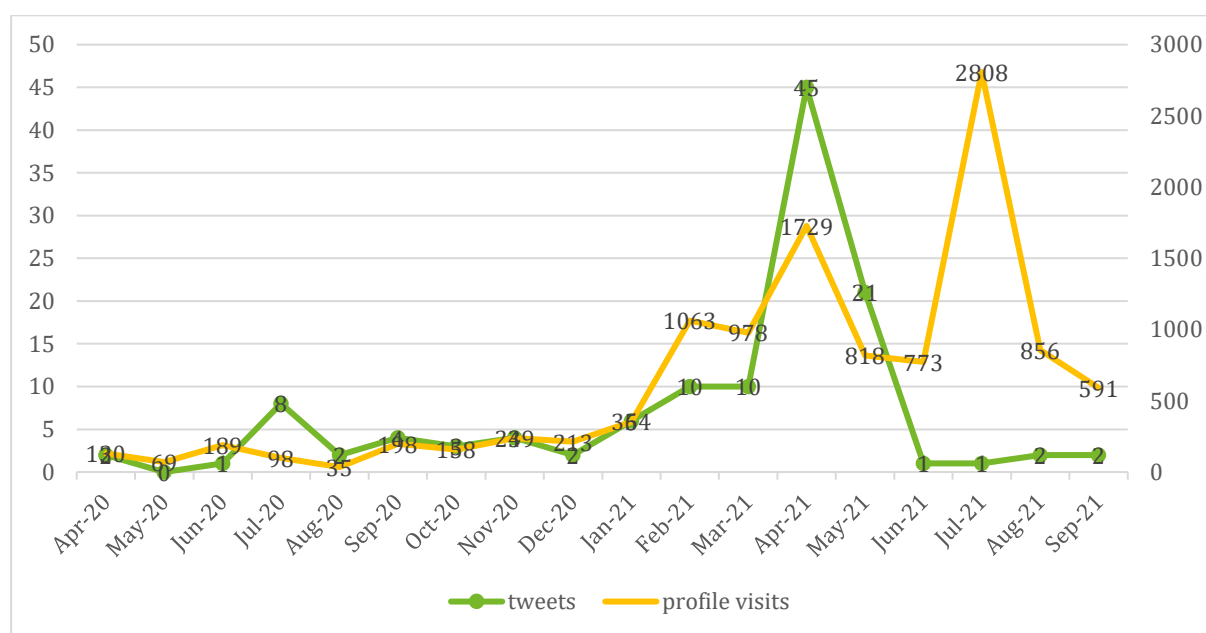


Table 8. List of tweets made *via* Twitter by project partners (last 6 months only).

Date	Tweet
13-09-21	# Essential Tools to realise #Sustainable #FoodSystems – the recently #LegumeInnovation catalogue - from @TRUELegumes highlights #HomeGrown #LegumeBased solutions Red circle-Rightwards arrow https://true-project.eu/publications-resources/innovation-catalogue/
08-09-21	#HapPeasiness is #HomeGrown @TRUELegumes is encouraging #GoodFoodCulture with a collection of amazing #EasyPeasy #LegumeRecipes for kids Check them out http://true-project.eu/2020/10/02/legume-cookbook-for-children/ Available in several languages http://true-project.eu/publications-resources/recipes/translations-easy-peasy/ #HealthyDiets #CoolBeans #LoveLegumes
06-09-21	Have you seen the many insights generated by @TRUELegumes ? With only 1 month left to go, we will highlight some of our main insights/outputs. SO STAY TUNED! #TRUEProject #LoveLegumes #LocallyGrown https://true-project.eu
05-08-21	Innovation is essential to trigger the transition to a more legume-based food&feed system. Our @truelegumes Innovation Catalogue developed by our partners is out: Food&Drinks Feed Agri systems Marketing and methods https://true-project.eu/work-packages/





Date	Tweet
13-07-21	How can policy instruments address the “legume paradox” and increase grain legume production and consumption across Europe? Great work of @Balint_ESSRG , @KelemenEszter4 ,@martawilton @AgroEcoAtJHI , @TizianaCentofanti
10-06-21	The 14th European #NitrogenFixation Conference will take place as an online event from 22nd September to 22nd October 2021, hosted by Aarhus University, Denmark. Registration deadline is the 27th June 2021. Register here: https://events.au.dk/enfc2021/signup #ENFC2021
21-05-21	Don't forget to register for our Policy Dialogue and #EUGreenWeek event @EU_ENV #Legumes play a crucial role in the EU Action Plan toward a #zeropollution Ambition which is a key action of the #EuropeanGreenDeal
17-05-21	Next week we will organise a online policy dialogue workshop which is also part of the #EUGreenWeek @EU_ENV Information and registration at: https://true-project.eu/news-events/po
11-05-21	There are great networks already active in a sustainable transition of #legumes in Europe. Lets benefit from each other and exchange knowledge across the whole value chain #legumeinnovationnetwork @pulses_increase @IntLegumeSoc @foeeurope @SlowFoodHQ @LegumeHubEU @terresunivia
11-05-21	Our last webinar has just started now! Today's aim is bringing the #legumeinnovationnetwork together! You can still join us on: http://legvalue.eu/virtual-conference/ @EUAgri @EU_H2020 @LEGumeVALUE
07-05-21	New interesting article @CORDIS_EU covers @TrueLegumes and @LegumeHubEU and is available in six languages: More #legumes, better health and environment News CORDIS European Commission https://europa.eu/!Qc83mN @EU_H2020 #legumeinnovationnetwork @EU_Commission
06-05-21	Thanks to all panelists for sharing their experiences! Main message from todays webinar is that the integration of the whole value chain is necessary in policy implementation and decisions at #EU level should bring up deliverables to national stakeholders #legumeinnovationnetwork
06-05-21	This was a great, interactive webinar. We talked about the role of policy in the transition of #legume production and consumption in Europe. Chris de Visser & Colleagues @WUR presented different scenarios to increase #legumes in Europe and their importance for policy decisions.
04-05-21	Last but not least! Next week our last webinar will take place. Join us and register at: http://legvalue.eu/virtual-conference/ #legumeinnovationnetwork @EIPAGRI_SP @EUAgri @EU_H2020 @pgrresearch @Arbikie @terresunivia
04-05-21	Trine Kastrup Dalsgaard from Aarhus University showed the great potential of green Biomass as food protein. There are several functional properties such as Solubility, Foaming, Emulsifier and Gelation. Enjoy your #legume meal! http://legvalue.eu/virtual-conference/ #legumeinnovationnetwork
04-05-21	In today's webinar Dr. David Styles @nuigalway and @bangoruni presented the Life Cycle Analysis and its development to assess the impacts of #legumes. #Footprints are helpful to consumers to compare different food products, but it also leads to important policy decisions.
04-05-21	Prof. Bob Rees @SRUC has shown that with cultivating #legumes we can reduce the dependence on Haber-Bosch Nitrogen and nitrogen fertilizer can be used more efficiently to fight hunger. #SDGs #legumeinnovationnetwork http://legvalue.eu/virtual-confer





Date	Tweet
04-05-21	Dr. Moritz Reckling @zalf_leibniz presented a cropping system assessment framework to better assess #legumes in rotations. One main conclusion of his case studies: legumes contribute consistently to a range of ecosystem services. #legumeinnovationnetwork http://legvalue.eu/virtual-confer



Public Deliverables

Public deliverables are accessible immediately upon their submission to the EC. Such public Deliverables generated during the fourth project year are listed below with links provided for direct download. The list of all public deliverables is available online [here](#).

Table 9. Publicly available Deliverables of Year 4, available on the project website.

Date	No.	Title	Authors	Partner	Link
30-04-2021	D1.2	Establish founding membership of the 'Legume Innovation Network'	Vickers R.; Muel F.; Fetzer L.; Maass H.; Iannetta P. Tran F.	PGRO UHOH, JHI	Link
30-09-2021	D1.6	Scientific, practice and policy publications – Year III	Callenius C.; Herrera, B.	UHOH, all partners	Link
21-12-2020	D1.8	Recipes for Legume Dishes in Europe	Nathansohn C.	SF	Link
29-06-2021	D1.10	Practice Abstracts II	Callenius C.; Fetzer, L.	UHOH	Link
21-07-2020	D3.3	Two scientific publications	Santos C; Ferreira, H.; Pinto E.; Silva B.; Gruber S.; Vasconcelos M.	UCP UHOH	Link
31-07-2021	D3.4	Best practice guide on legume processing and inclusion	Weiss, M.; Slater M.J.	AWI	Link
31-07-2021	D3.5	Innovation Catalogue	Weiss, M.; Slater M.J.	AWI	Link
18-06-2021	D 7.4	Policy Briefs & Recommendations	Balázs B.	ESSRG	Link
30-04-2020	D9.6	Annual activity plan - Year IV	Tran F; Bienkowski D.; Iannetta P.	JHI	Link
15-06-2020	D 9.9	Project Review, Impact and Legacy Plan - Report I	Iannetta P.; Hawes C.; Tran F.; Balázs B.; Kelemen E.; Styles D.; Ntatsi G.; Savvas D.; Hamann K.; Luiza Toma; Shrestha S.; Vasconcelos M.; Gomes A.; Williams M.; Debeljak M.; Trajanov A.; Vickers R.	JHI ESSRG BU IFAU AUA SRUC UCP TCD JSI PGRO	Link



European Legume Innovation Network (ELIN) workshops

The resources used and generated from these events are made available publicly on the TRUE website: [here](#).

Table 10. TRUE ELIN stakeholder workshops in project year 4.

Date	Title	Authors	Partner	Link
3 March 2021	3rd TRUE LIN Workshop in the Atlantic/Boreal region <i>"EU-Green Deal mineral-nitrogen fertiliser reductions targets: the central role of legumes"</i> . online hosted by Teagasc.	Humphreys J. Iannetta P. Rees B. Leavy E. Hennessy M. Barry D.	TEAGASC JHI SRUC UHOH UB TCD	Link
1 October 2020	3rd TRUE LIN Workshop in the Mediterranean region <i>"How to create value using agroecology and local markets in uncertain times?"</i> , online	Iannetta P. Rubiales Vasconcelos M. Hamann K. Balasz B.	JHI UCP IFAU ESSRG	Link

The Legume Innovation Network (LIN) was launched in May 2021 at a joint conference of LEGVALUE and TRUE. The Webinar series is available under [here](#) and videos are hosted in [here](#).

Table 11. Webinar European Legumes in Transition . LIN launch Year 4.

Date	Title	Category	Facilitator Partner	Link
14-4-21	Webinar 1 /8: Digging-in to legumes and the potential of the Legume Innovation Network	Webinar, presentation, video	PGRO/JHU	link
20-4-21	Webinar 2 /8: Optimising legume production	Webinar, presentation, video	PGRO/JHU	link
22-4-21	Webinar 3 /8: Legume based value chains, farm gate and beyond and the market	Webinar, presentation, video	PGRO	link
27-4-21	Webinar 4 /8: The diversity of end uses for legumes.	Webinar, presentation, video	PGRO/UCP/TCD	link
29-4-21	Webinar 5 /8: Pushing the boundaries in legume breeding	Webinar, presentation, video	PGRO	link
4-5-21	Webinar 6 /8: Science, innovation, and the empowerment of legumes	Webinar, presentation, video	PGRO/JHU/CU/BU/UCP/SRUC	link
6-5-21	Webinar 7 /8: The role of policy in the transition of legume	Webinar, presentation, video	PGRO /ESSRG	link





	production and consumption in Europe			
11-5-21	Webinar 8 /8: Bringing the Legume Innovation Network together	Webinar, presentation, video	PGRO	link



Annexes

Annex 1: Stakeholder events (excluding ELINs)

Table 11. Stakeholder events (co-)organised by TRUE members in project year 4 (*non-exhaustive list*).

Date	Title	Event	Authors	Partner	Link
04.05.2020	DIVERBeans Project Online Workshop	Online (North macedonian Stakeholders/growers)	Iannetta, P.P.M.	JHI	link
08.04.2021	Organisation of a sustainability-focused conference - "STC Sustainability Conference 2021 - Growing in the Green: mixes and mulches"	STC Sustainability Conference 2021 - 'Growing in the Green: mixes and mulches'; Online meeting	Banfield-Zanin, J.A.	STC	
22.06.2020	Disco Soup – legume edition	Evening Event 4th GA			
19.02.2021	Post-TRUE demonstration trial farmer consultation	Farmer Engagement and Technology Transfer at Nyabeda field trial	Makatiani, E., Otieno, J., Adienge, A., Magare, C.	KEFRI	
28.01.2021	Advertising the TRUE-LEGVALUE series of webinars to Danish stakeholders by direct mails	Invitations to join the series of webinars	Hamann K.	IFAU	
24.04.2020	Online consultation with TRUE producers	Online consultation with TRUE producers		AK	
30.05.2020	Field visit of TRUE producers - preparation of protocols for the 2020 cultivation year	Meetings with small-scale farmers at Nagyszékely, Kóspallag, Orgovány, Szár, Tőreki, Törtel, Zsámbok		AK	
29.09.2020	Mini-workshop with chefs, gastro-bloggers and media-workers on Hungarian Gastro-revolution with special attention on sustainability	Organized by Agri Kulti, Budapest		AK	
24.02.2021	IV. TRUE cultivation meeting of Hungarian pulse land races - online event	Co-organized with ÖMKI - Hungarian Research Institute of Organic Agriculture, online event	Co-organized with ÖMKI - Hungarian Research Institute of Organic Agriculture	AK	





Annex 2: Public events

Table 12. Public events organised by/with contributions from TRUE members in project year 4 (*non-exhaustive list*).

Date	Title	Event	Authors	Partner	Link
10.02.2021	Digital Event „Legumes“ (World day of legumes)	World Legume Day tasting: small bean, big future		SF	Link
28.03.2021	Dolce Vita H1 – radio broadcast in cooperation with SF Frankfurt	Dolce Vita	SF Conviva Frankfurt	SF	
03.09.2021	Different Events (distribution cookbook)		SF Conviva Germany	SF	
2020	Menu Planning Eurest (Plano de Ementas) "Choose Beans"	Menu Planning Eurest (Plano de Ementas) "Choose Beans" Eurest Portugal restaurants	Oliveira, B. and Varandas, E.	EUR	
2020/2021	3rd Ebook recipes collection	New ebook recipes collection	Oliveira, B. and Varandas, E.	EUR	
2021	Menu Planning Eurest (Plano de Ementas) "Choose Beans"	Menu Planning Eurest (Plano de Ementas) "Choose Beans" Eurest Portugal restaurants	Oliveira, B. and Varandas, E.	EUR	
2021	Slow Food E- book testing, photo, and online edition/ www.eurest.pt (PT translation)	Ebook Slow Food	Oliveira, B. and Varandas, E.	EUR	https://www.eurest.pt/choose-beans/



Annex 3: Workshops attendance

Table 13. Workshops events with contributions from TRUE members in project year 4 (non-exhaustive list).

Date	Title	Event	Collaborator	Partner	Link
31-04-20	Workshop chairperson	Crop Diversification Cluster Group meeting in tandem with European Society of Agronomy	Iannetta, P.P.M.	JHI	Link
23-03-21	Workshop panellist	REMIX-DIVERSify Projects joint final conference	Iannetta, P.P.M.	JHI	Link
23-03-21	Workshop contributor	Achieving Net Zero in the Scotch Whisky industry by 2040	Iannetta, P.P.M.	JHI	Link
12-10-20	Attendance at CHAP Advisory Panel meeting, discussion of role of legumes in sustainable UK agriculture, and role of CHAP capabilities in research to support this	CHAP Advisory Panel meeting, October 2020; Online meeting	Banfield-Zanin, J.A.	STC	
12-05-21	Attendance at RES Sustainable Agriculture SIG meeting	2021 RES Sustainable Agriculture SIG Meeting	Banfield-Zanin, J.A.	STC	
04-04-20	Workshop on "local production in the time of COVID-19", organized by Gusztáv NEMES	Organized by independent scientific group		AK	
20-05-19	EURAKNOS online meeting - easy-to-access and inclusive projects related to agriculture and forestry	Organized by EURAKNOS project		AK	
30-10-20	URBACT - Food Corridors Project - investigating local food chain possibilities @Szécsény, N-Hungary	Organized by URBACT, online event		AK	
17-11-20	Future of Agritech - online conference organized by Design Terminal	Organized by Design Terminal, Budapest - online event		AK	
23-11-20	EURAKNOS online meeting - Short Supply Chain roundtable discussion	Organized by EURAKNOS project - online event		AK	
23-03-21	URBACT - Food Corridors Project - online event on risk assessment	Organized by URBACT, online event		AK	



Annex 4: TRUE partner social media activities

Some TRUE partners listed their activities on Social Media channels like Facebook, Twitter, LinkedIn and Researchgate.

Table 14. TRUE partner social media activities, Year 4 (*non-exhaustive list*).

Date	Title	Authors	Partner	Link
Sep 20	Blogpost			Link
31.04.20	CAWR newsletter - legumes for fertility	Judith Conroy, Francis Rayns	CU	
31.06.20	CAWR newsletter - planting out bean variety trials	Judith Conroy, Francis Rayns	CU	
31.07.2020	CAWR newsletter - sweetcorn as a test crop after green manures	Judith Conroy, Francis Rayns	CU	
31.09.20	CAWR newsletter - harvesting the green manure following test crop	Judith Conroy, Francis Rayns	CU	
31.04.21	CAWR newsletter - laboratory analysis recommencing after lockdown	Judith Conroy, Francis Rayns	CU	
24.09.2020	Twitter activity	Banfield-Zanin, J.A.	STC	Link
10.02.2021	Twitter activity	Banfield-Zanin, J.A.	STC	Link
03.03.2021	Twitter activity	Banfield-Zanin, J.A.	STC	Link
10.02.2021	Social media post (Facebook)		PIRED	Link
02.07.2020	Transition paths to sustainable legume-based systems in Europe	Martha Walter	IGV	Link
24.09.2020	Transition paths to sustainable legume-based systems in Europe	Martha Walter	IGV	Link
30.09.2020	The daily (legume) bread	Martha Walter	IGV	Link
08.02.2021	Transition paths to sustainable legume-based systems in Europe	Martha Walter	IGV	Link
16.02.2021	Product development of IGV within the TRUE project	Martha Walter	IGV	Link
12.04.2021	Transition paths to sustainable legume-based systems in Europe	Martha Walter	IGV	Link (facebook) Link (Twitter)
04.05.2021	More legumes, better health, and environment		IGV	Link
17.05.2021	Recommendation of the webinar recording from the Virtual Conference "EUROPEAN LEGUMES IN TRANSITION"	Martha Walter	IGV	Link
23.07.2021	A Multifunctional Solution for Wicked Problems: Value-Chain Wide Facilitation of Legumes Cultivated at Bioregional Scales Is Necessary to Address the Climate-Biodiversity-Nutrition Nexus	Pietro P. M. Iannetta	IGV	Link (facebook) Link (Twitter) Link LinkedIn





Date	Title	Authors	Partner	Link
06.08.2021	Policy Interventions Promoting Sustainable Food- and Feed- Systems: A Delphi Study of Legume Production and Consumption	Bálint Balázs, Eszter Kelemen	IGV	Link
06.08.2021	Comparative life cycle assessment of plant and beef-based patties, including carbon opportunity costs	Sophie Saget	IGV	Link
06.09.2021	green bean mkhali / recipe		SF	Link
20.04.2020	Tweet - legume green manures for soil fertility	Judith Conroy	CU	Link
06.04.2020	FB (re)post on legume consumption - original by ESSRG		AK	
22.04.2022	FB post on Earth's Day - in relation with TRUE and legumes		AK	
23.05.2020	FB post on how climate change affects agriculture - and how legumes could help climate adaptation		AK	
25.05.2020	FB (re)post on legume-based flours		AK	
01.06.2020	FB post on 1st round-visit of TRUE producers in the 2020 cultivation year		AK	
05.06.2020	FB post on the diversity of legumes and the importance of alternative proteins in the context of sustainability and health.		AK	
16.06.2020	FB post on making the short video on AK Case Study for TRUE GA meeting		AK	
23.06.2020	FB post on TRUE GA Meeting		AK	
12.07.2020	FB post on visits of TRUE producers @Orgovány		AK	
03.08.2020	FB post on visits of TRUE producers and data gathering into protocols		AK	
18.08.2020	FB post on TRUE producers - black chickpea @Kóspallag		AK	
22.08.2020	FB post on TRUE producers - @Töreki and @Nagyszékely		AK	



Annex 5: TRUE partner project subpages

Most of the TRUE partners refer to the TRUE-Project and the TRUE website on their organisation's website (see list below).

Table 15. List of TRUE partner project subpages referring to the project and its website (*non-exhaustive list*).

Partner	Website
AK	https://www.agrikulti.hu/portfolio/true/
ADL	
AUA	https://www2.aua.gr/el/news-events/nea/horizon-2020-programma-true-transition-paths-sustainable-legume-based-systems-europe
AWI	https://www.awi.de/forschung/besondere-gruppen/aquakultur/aquakulturforschung/projekte/true.html
BU	
CU	https://www.coventry.ac.uk/research/research-directories/current-projects/2019/true/ and
ESSRG	https://www.essrg.hu/hu/true-hu/
EUR	https://www.eurest.pt/sustentabilidade/#true
FDM	
IFAU	http://www.ifau.dk/om-ifau/nyheder/
IGV	http://www.igv-gmbh.de/igv-gmbh/aktuelles/detail/artikel/eu-projekt-zur-foerderung-des-anbaus-von-huelsenfruechten-in-europa/
JHI	https://www.hutton.ac.uk/news/true-food-security-explored-legume-based-perspective
JSI	
KEFRI	
PGRO	https://www.pgro.org/press-release-1-march-2019/
PIRED	http://www.redea.hr/en/about-us/current-projects/
SF	https://www.slowfood.de/slow_themen/lebensmittelerzeugung_und_konsum/projekte_und_aktionen/eu_projekt_huelsenfruechte_true
SOL	
SRUC	https://www.sruc.ac.uk/info/120258/behavioural_change_and_innovation
STC	
TCD	
TEAG	
UCP	http://www.cbqf.esb.ucp.pt/en/cbqf-projects?nid=16582&token=b3186e0959b56733c735cf5d71741813



Annex 6: Background to the TRUE project

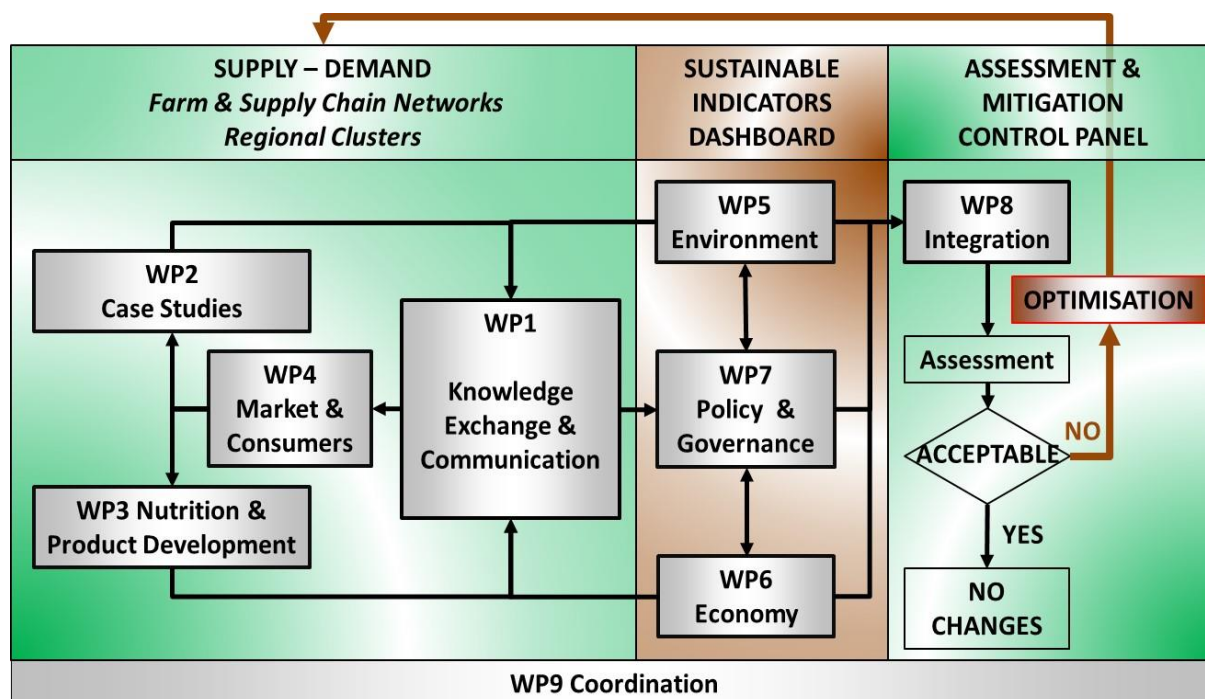
Executive Summary

TRUE's perspective is that the scientific knowledge, capacities and societal desire for legume supported systems exist, but that practical co-innovation to realise transition paths have yet to be achieved. TRUE presents 9 Work Packages (WPs), supported by an *Intercontinental Scientific Advisory Board*. Collectively, these elements present a strategic and gender-balanced work-plan through which the role of legumes in determining 'three pillars of sustainability' – 'environment', 'economics' and 'society' – may be best resolved. TRUE realises a genuine multi-actor approach, the basis for which are three *Regional Clusters* managed by WP1 ('*Knowledge Exchange and Communication*', University of Hohenheim, Germany), that span the main pedo-climatic regions of Europe, designated here as *Continental*, *Mediterranean* and *Atlantic*, and facilitate the alignment of stakeholders' knowledge across a suite of 24 Case Studies. The Case Studies are managed by partners within WPs 2-4 comprising 'Case Studies' (incorporating the project database and *Data Management Plan*), '*Nutrition and Product Development*', and '*Markets and Consumers*'. These are led by the Agricultural University of Athens (Greece), Universidade Catolica Portuguesa (Portugal) and the Institute for Food Studies & Agro-Industrial Development (Denmark), respectively. This combination of reflective dialogue (WP1), and novel legume-based approaches (WP2-4) will supply hitherto unparalleled datasets for the 'sustainability WPs', WPs 5-7 for '*Environment*', '*Economics*' and '*Policy and Governance*'. These are led by greenhouse gas specialists at Trinity College Dublin (Ireland; in close partnership with Life Cycle Analysis specialists at Bangor University, UK), Scotland's Rural College (in close partnership with University of Hohenheim), and the Environmental and Social Science Research Group (Hungary), in association with Coventry University, UK, respectively. These *Pillar WPs* use progressive statistical, mathematical and policy modelling approaches to characterise current legume supported systems and identify those management strategies which may achieve sustainable states. A key feature is that TRUE will identify key *Sustainable Development Indicators* (SDIs) for legume-supported systems, and thresholds (or goals) to which each SDI should aim. Data from the *foundation WPs* (1-4), to and between the *Pillar WPs* (5-7), will be resolved by WP8, '*Transition Design*', using machine-learning approaches (e.g. *Knowledge Discovery in Databases*), allied with *DEX* (*Decision Expert*) methodology to enable the mapping of existing knowledge and experiences. Co-ordination is managed by a team of highly experienced senior staff and project managers based in The Agroecology Group, a Sub-group of Ecological Sciences within The James Hutton Institute.



Work-package structure

The flow of information and knowledge in TRUE, from the definition of the 24 case studies (left), quantification of sustainability (centre) and synthesis and decision support (right).





Project partners

No	Participant organisation name (and acronym)	Country	Organisation Type
1 (C*)	The James Hutton Institute (JHI)	UK	RTO
2	Coventry University (CU)	UK	University
3	Stockbridge Technology Centre (STC)	UK	SME
4	Scotland's Rural College (SRUC)	UK	HEI
5	Kenya Forestry Research Institute (KEFRI)	Kenya	RTO
6	Universidade Catolica Portuguesa (UCP)	Portugal	University
7	Universität Hohenheim (UHOH)	Germany	University
8	Agricultural University of Athens (AUA)	Greece	University
9	IFAU APS (IFAU)	Denmark	SME
10	Regionalna Razvojna Agencija Medimurje (REDEA)	Croatia	Development Agency
11	Bangor University (BU)	UK	University
12	Trinity College Dublin (TCD)	Ireland	University
13	Processors and Growers Research Organisation (PGRO)	UK	SME
14	Institut Jozef Stefan (JSI)	Slovenia	HEI
15	IGV Institut Fur Getreideverarbeitung GmbH (IGV)	Germany	Commercial SME
16	ESSRG Kft (ESSRG)	Hungary	SME
17	Agri Kulti Kft (AK)	Hungary	SME
18	Alfred-Wegener-Institut (AWI)	Germany	RTO
19	Slow Food Deutschland e.V. (SF)	Germany	Social Enterprise
20	Arbikie Distilling Ltd (ADL)	UK	SME
21	Agriculture And Food Development Authority (TEAG)	Ireland	RTO
22	Sociedade Agrícola do Freixo do Meio, Lda (FDM)	Portugal	SME
23	Eurest -Sociedade Europeia De Restaurantes Lda (EUR)	Portugal	Commercial Enterprise
24	Solintagro SL (SOL)	Spain	SME
25	Public Institution Development of the Medimurje County (PIRED)	Croatia	Development Agency

*Coordinating institution





Objectives

Objective 1: Facilitate knowledge exchange (UHOH, WP1)

- *Develop a blueprint for co-production of knowledge*

Objective 2: Identify factors that contribute to successful transitions (AUA, WP2)

- *Relevant and meaningful Sustainable Development Indicators (SDIs)*

Objective 3: Develop novel food and non-food uses (UCP, WP3)

- *Develop appropriate food and feed products for regions/cropping systems*

Objective 4: Investigate international markets and trade (IFAU, WP4)

- *Publish guidelines of legume consumption for employment and economic growth*
- *EU infrastructure-map for processing and trading*

Objective 5: Inventory data on the environmental intensity of production (TCD, WP5)

- *Life Cycle Analyses (LCA) -novel legumes rotations and diet change*

Objective 6: Economic performance - different cropping systems (SRUC & UHOH, WP6)

- *Accounting yield and price risks of legume-based cropping systems*

Objective 7: Enable policies, legislation and regulatory systems (ESSRG, WP7)

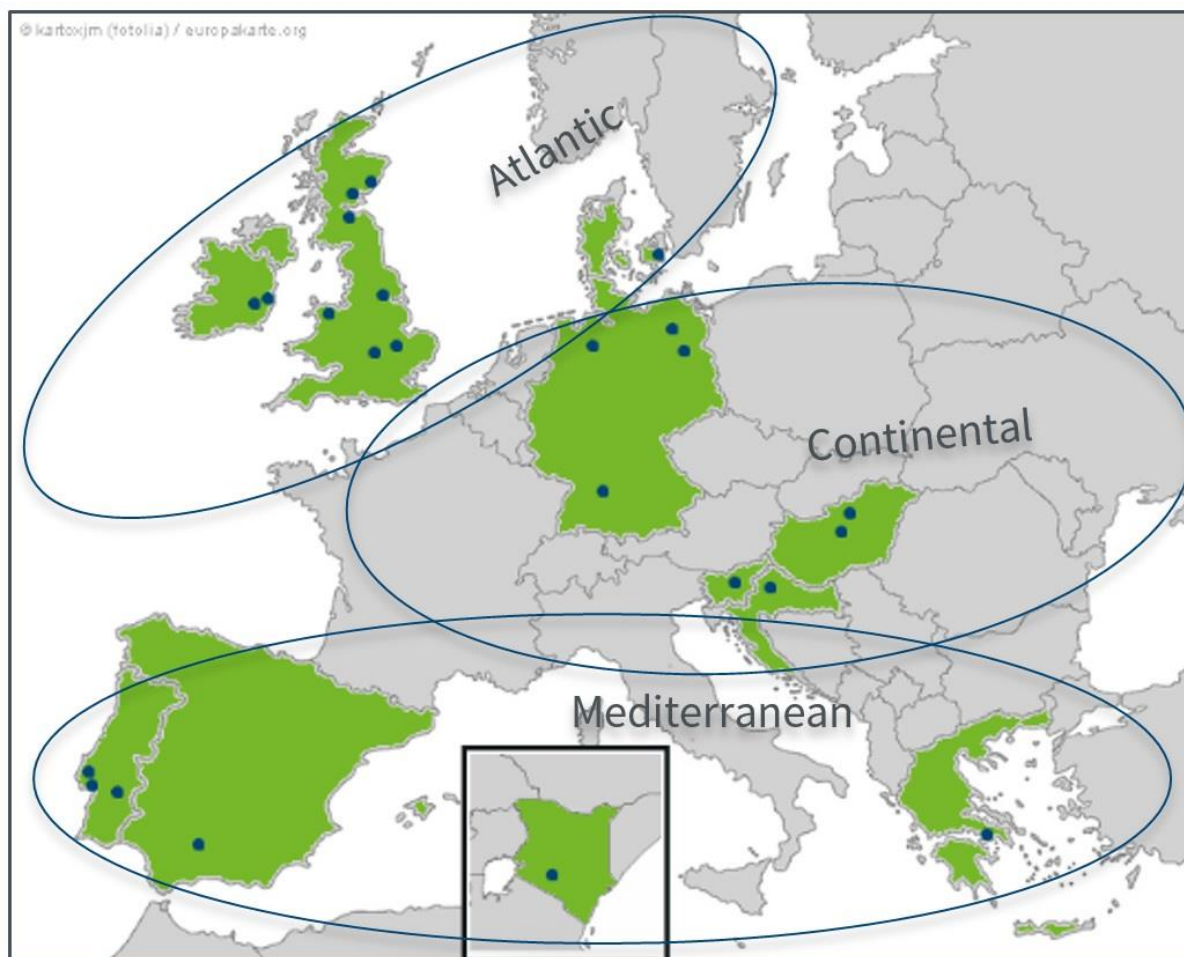
- *EU-policy linkages (on nutrition) to inform product development/uptake*

Objective 8: Develop decision support tools: growers to policymakers (JSI, WP8)

- *User-friendly decision support tools to harmonise sustainability pillars*



Legume Innovation Networks



Knowledge Exchange and Communication (WP1) events include three TRUE European Legume Innovation Networks (E-LINs), and these engage multi-stakeholders in a series of focused workshops. The E-LINs span three major pedoclimatic regions of Europe illustrated above within the ellipsoids for Continental, Mediterranean and Atlantic zones.



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