



TRansition paths to sUustainable
legume-based systems in EEurope

Leguminosen. Europäische Perspektive von Anbau bis Konsum

St. Pölten, Arche Noah Ideenlab, Sept. 2018





Projekt-Informationen (1)

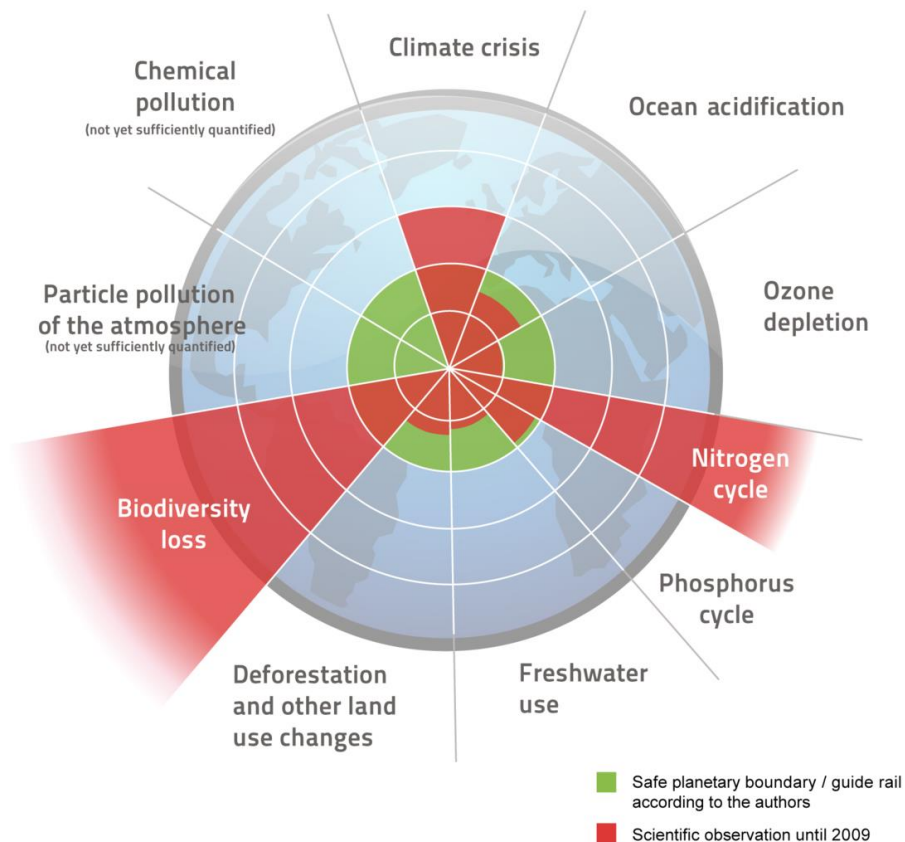
- **EU Programm:** Horizon 2020
- **Ausschreibung:** SFS-26-2016 (Legumes - transition paths to sustainable legume-based farming systems and agri-feed and food chains)
- **Ziele der EU:** Die Abhängigkeit der EU von importierten Eiweißfutter (v.a. Soja) und synthetischem Stickstoffdünger reduzieren
- **Laufzeit:** 01.04.2017 – 31.03.2021
- **Gesamtbudget:** 5 Mio. € (davon 68% akademische und 32% für nicht akademische Konsortiums-Mitglieder)



Die Grenzen des Planeten sind überschritten

Planetary Boundaries

after Johan Rockström, Stockholm Resilience Centre et al. 2009

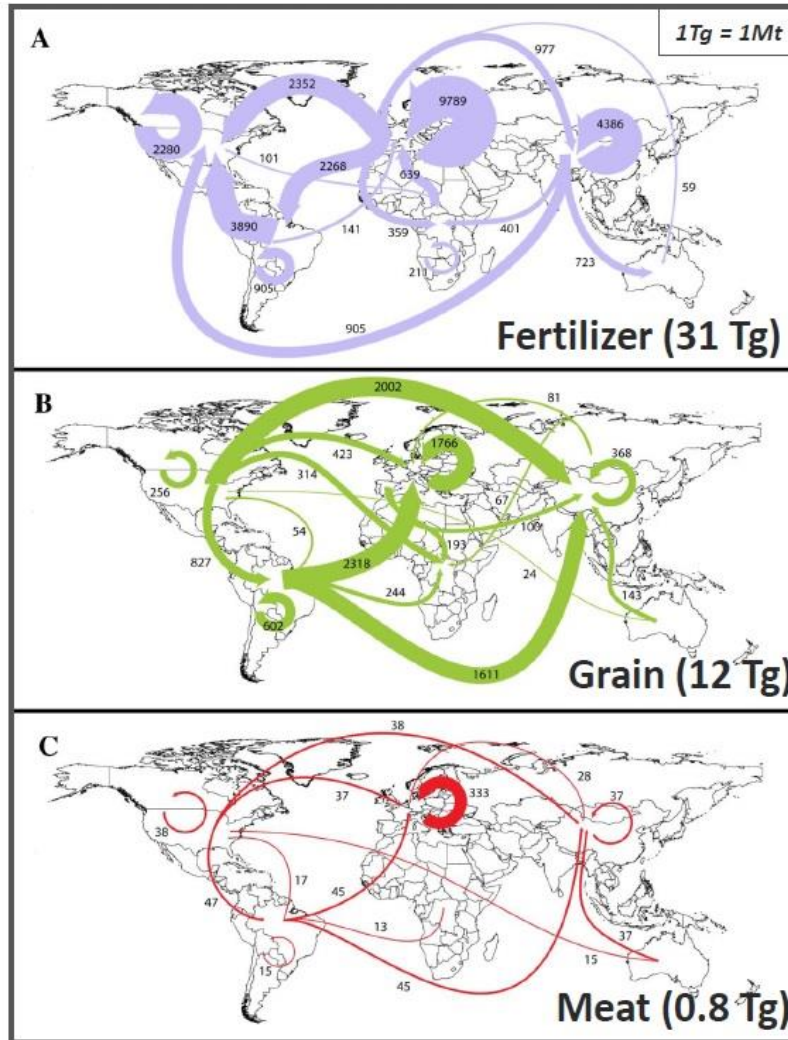


Rockström et al., (2009). A safe operating space for humanity. *Nature* **461**, 472.

Illustration: Felix Müller (www.zukunft-selbermachen.de) Licence: CC-BY-SA 4.0



Die Stickstoff-Krise ist auch eine Protein-Krise



Internationaler Handel mit reaktivem Stickstoff

Ungesunde Abhängigkeiten und Stickstoffflüsse in der EU

- **Stickstoffdünger**
- **Futtermittel**
- **Fleisch**

Galloway *et al.*, (2008). *Science* **320**, 889.
 Erisman *et al.*, (2008). *Nature Geosci.* **1**, 636.
 Seufert *et al.*, (2012) *Nature* **485**, 229.





Projekt-Informationen (2)

- **Konsortium:** 24 akademische and nicht-akademische Mitglieder
- **Struktur:** 9 vernetzte Arbeitspakete, 24 Fallstudien entlang der Wertschöpfungsketten von verschiedenen Leguminosen als Nahrungs- und Futtermittel
- **Externe Unterstützung:** Interkontinentaler wissenschaftlicher Beirat
- **Koordination:** Dr. Pietro Iannetta, James Hutton Institute, Scotland, UK, email: true@hutton.ac.uk
- **Multi-Actor-Approach:** Einbindung von Interessenvertretern (z.B. mit transdisziplinären Workshops) und Aufbau eines "Leguminosen-Innovations Netzwerks"





Beschreibung und Projekt-Ziele

- **Identifikation geeigneter Wege zur Ausweitung des nachhaltigen Anbaus und Konsums von Leguminosen in Europa**
- Betrachtung der **gesamten Wertschöpfungskette** von leguminosenbasierten Nahrungs- und Futtermitteln
- Entwicklung konkreter **Innovationen**, v.a. im Bereich Lebensmittel
- Erarbeitung eines **unterstützenden Entscheidungs-Instrumentes für Praxis und Politik**, welches eine Vielzahl von Leguminosenarten und Verarbeitungsansätze umfassen und an die pedoklimatischen Regionen und betrieblichen Bedingungen angepasst sein soll
- Die Europäische Kommission fördert das Projekt, um die Abhängigkeit der EU von importierten Eiweißfutter (v.a. Soja) und synthetischem Stickstoffdünger zu reduzieren.



Beschreibung und Projekt-Ziele



Sustainability Approach:

Optimizing the **overlapping areas** of the 3 pillars of sustainability to become:

bearable
viable
equitable





TRUE consortium: 24 members, 11 countries



TRUE consortium at the KickOff in Edinburgh

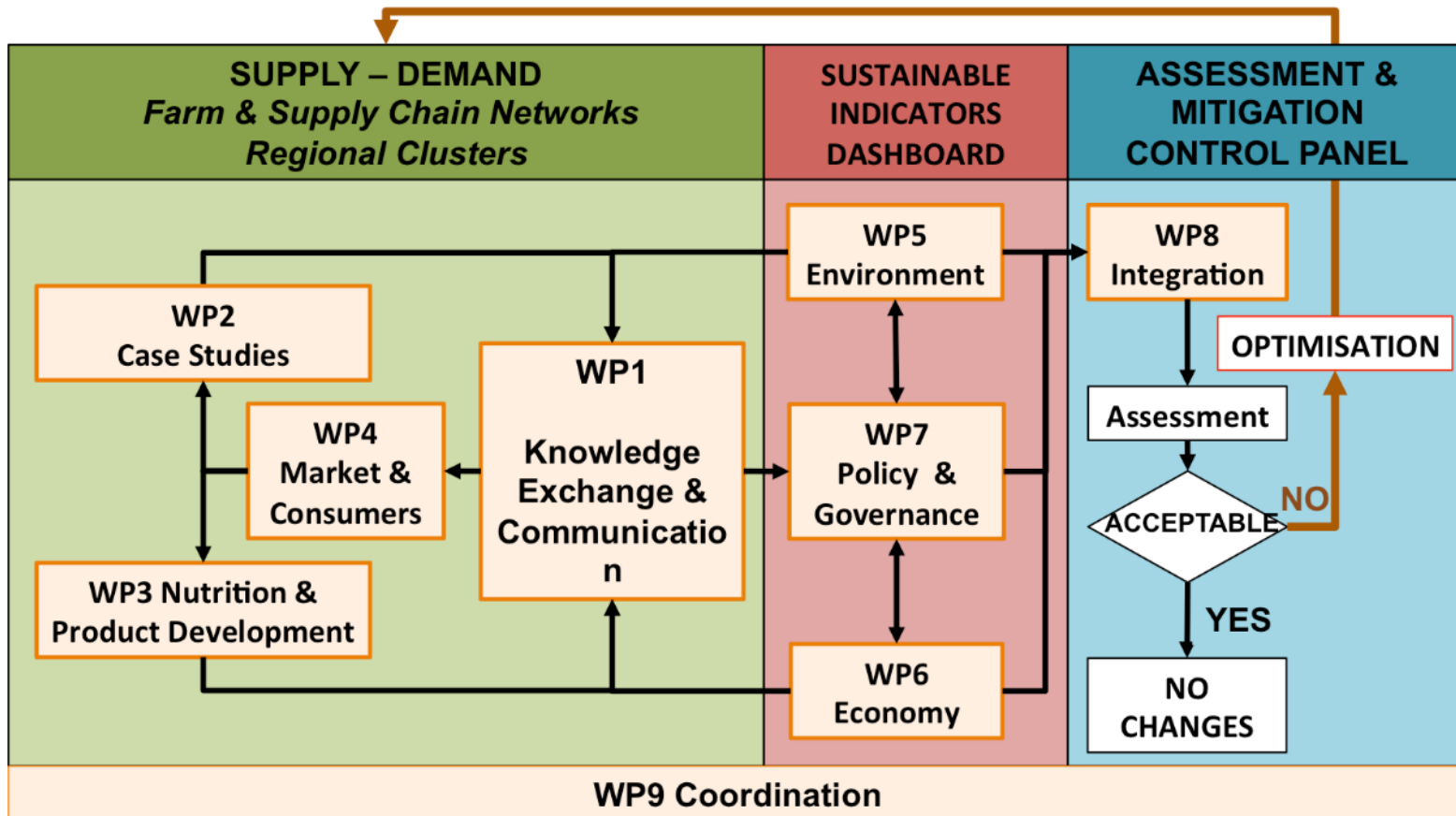


Arbeitspakete

- AP1: Wissensaustausch und Kommunikation
- AP2: 24 Fallstudien
- AP3: Ernährung und Produktentwicklung
- AP4: Märkte und Verbraucher
- AP5: Ökobilanzierung und Nährstoffqualitätsbewertung von Leguminosen-Anbau und –Produkten
- AP6: Ökonomische Bewertung von Leguminosen-Anbau und –Konsum
- AP7: Politik und Regulierung
- AP8: Übergangswege und unterstützendes Entscheidungsinstrument
- AP9: Projektkoordination

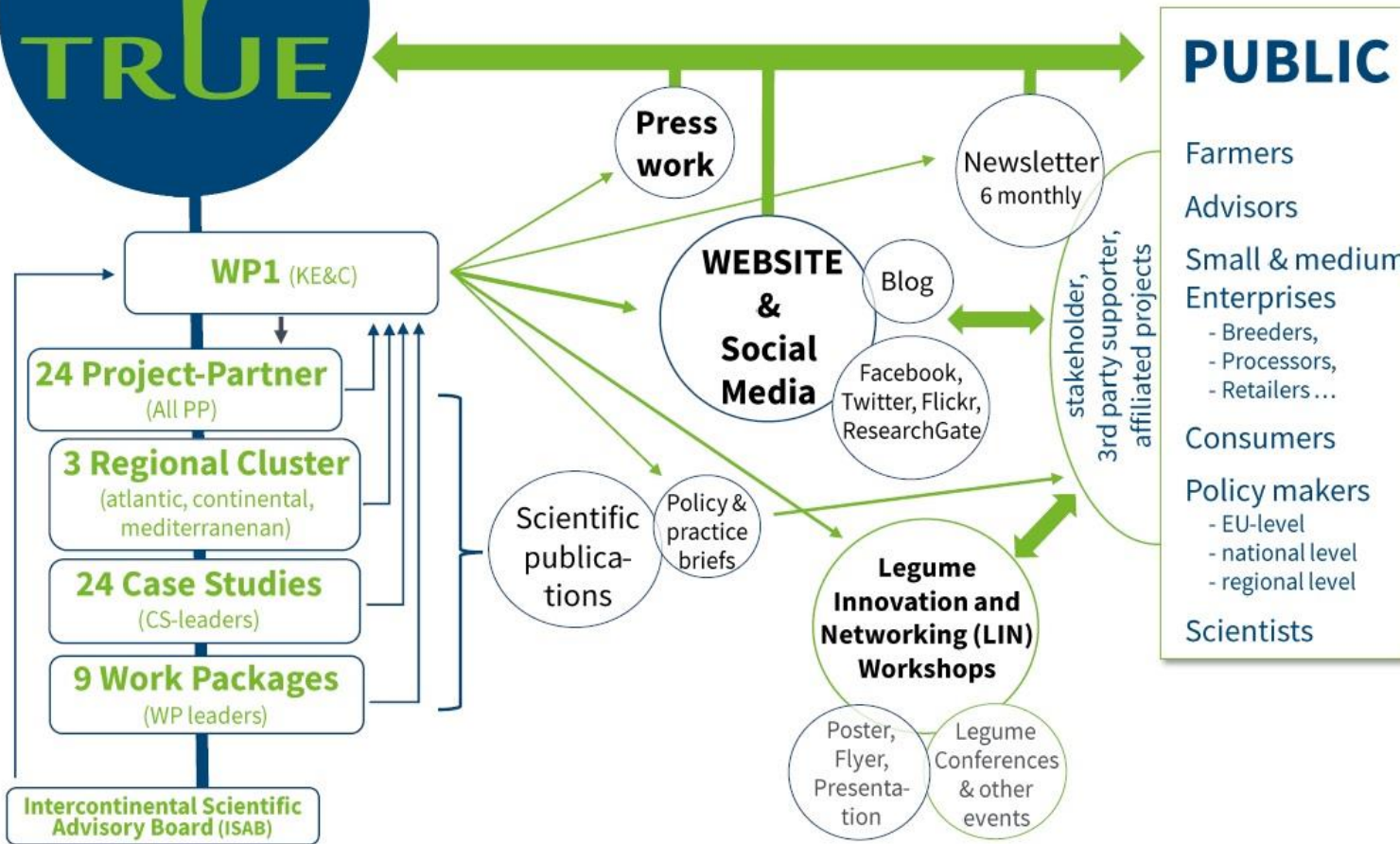


Arbeitspakete





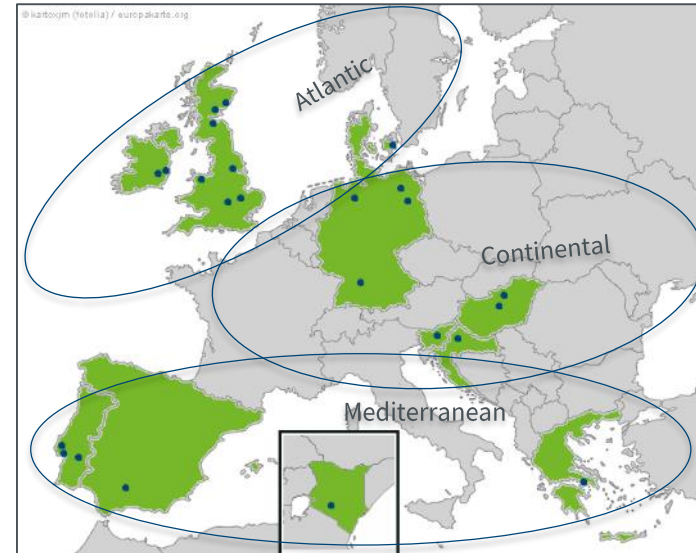
Communication Strategy



Regionale Cluster und Fallstudien



In den **24 Fallstudien** sind viele verschiedene Leguminosenarten involviert. Die Textgröße ist relative zur Anzahl der Fallstudien mit dieser Art.



The Case Studies are spread across three **Regional Cluster** according to the different pedo-climatic conditions



Regional Cluster and Case Studies

Atlantic Cluster - Case Studies

- CS 1: Expanding legume based pasture uptake
- CS 2: Clover-sward reliant organic production
- CS 3: Intercrops for food & feed
- CS 4: Self-sufficiency - novel rotation
- CS 5: Legume intercrops for forage or biomass
- CS 6: Precision Agriculture Technologies: living mulches for cereal production
- CS 7: Heritage varieties for enhanced human and beneficial insect nutrition
- CS 8: Using legumes as a source of fertility in organic protected cropping systems
- CS 9: Retailer-producers quality chain length
- CS 10: Market model development for organic pork
- CS 11: Characterise vegetarian foods quality chain
- CS 12: Vegetarian food formulation

Continental Cluster - Case Studies

- CS 13: Assess structure/profit short supply chains - grain products
- CS 14: Assess structure/profit short supply chains - Tofu, feed
- CS 15: Organic lupins for aquaculture feeds
- CS 16: Policy for sustainable development
- CS 17: Sustainable short supply chains delivering novel legume products to reconnect producers and urban consumers

Mediterranean Cluster - Case Studies

- CS 18: Ancient & heritage variety screening for higher nutritive value
- CS 19: Consumers - legume dishes
- CS 20: Processors - snack and convenience foods
- CS 21: Novel grafted types - high yield
- CS 22: Elite inoculum - inc. yield & profit
- CS 23: Breeding for high production and NUE Mediterranean agroecological pedoclimatic stresses
- CS 24: Silvo-arable production & quality chain characterisation





Regional Cluster and Case Studies

**FOOD
FEED**

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Case Study 7: Heritage Varieties for enhanced human and beneficial insect nutrition

Coventry University, UK



Barbara Smith and Francis Rayns, Coventry University

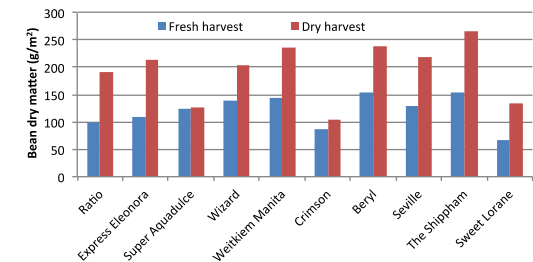


It has been suggested that heritage varieties of legumes may provide enhanced benefits for human and insect nutrition but there has been no research to confirm this. We are investigating:

- 1) Five heritage varieties and five modern varieties of both *Vicia faba* (broad bean and field bean types) and *Phaseolus vulgaris* (climbing French bean type) will be grown.
- 2) The nutritional content of the crops (protein and carbohydrate content, vitamins and minerals in the beans) will be analysed.
- 3) Pollinating insect visitation will be quantified and related to the production of floral volatile chemicals that may be responsible for attracting them. The quality of floral resources that are provided in return (e.g. amino acid profiles of pollen and the sugar content of nectar) will be analysed.



Heritage variety: Crimson flowered *Vicia faba*



Preliminary results from 2017 pilot study using *Vicia faba*

THE PRACTICAL WORK FOR THIS CASE STUDY WILL BE DONE IN YEARS 2 AND 3 OF THE PROJECT. In 2017 a pilot project was run to test the methodology.



Case study 13: Why is lentil (*Lens culinaris*) cultivation a success story in south-west Germany?



University of Hohenheim, Germany

- Status quo analysis of lentil cultivation as a reintroduced traditional food crop in the region
 - Questionnaires about crop management of lentils (site conditions, crop rotation, tillage, varieties, companion crops, yield, marketing etc.)
 - Semi-structured interviews with farmers about their motivation and obstacles regarding lentil cultivation
- Sample size: 21 organic and 4 conventional farmers
 - Progress status:
 - Data collection: ✓
 - Data entry: *work in progress*
 - Data analysis: *work in progress*



Case Study 17 - Pulses in Short Food Supply Chains

Overall goal: Test Hungarian traditional/local legume varieties from small-scale production to quality gastronomy along a short food supply chain.

- I. Selection of genetic resources
- II. Cultivation experiments
- III. Processing and product development
- IV. Consumers' feedback



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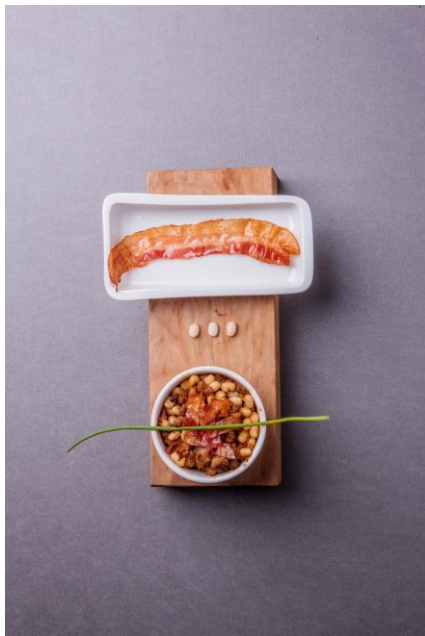
Urban Gastronomy: high-end legume based meals



I. Analysis of nutritional content

II. Evaluation of gastronomic potential

III. Processing, recipe and product development



Case Study 18: Ancient & heritage variety screening for higher nutritive value



Sociedade Agrícola do Freixo do Meio, Portugal

Ancient & heritage variety screening for higher nutritive value

- **Main Products: Greenpods, grain, grain products**
- **Legume Crop: Common bean, Lupin, Lentil, Chickpea**

Aim

- Analyse the new strategies that recreate the multifunctional montado traditional system, and adapt it to new economic, social and environmental challenges

Adding Value

- **Showcasing a successful and personalized short supply chain**
- **Understand the new forces and dynamics that intercross and may result in facilitation, or blockage, in the development of farm multifunctionality, with the inclusion of legume grains.**
- **Provide legume grains for novel food and feed development**



Leguminosen-Rezepte

- **Slow Food Deutschland** ist als Projektpartner beteiligt
- Rezeptbuch „**True Foodprint: Rezepte mit Hülsenfrüchten zu Förderung nachhaltiger Ernährungssysteme**“
- **Geschichte, Nährstoffe, ökologischer Fußabdruck**



Photos © Guy Hudson, Gisela Bautz, Rupert Ebner, Herbert Dött, Alberto Peroli, Keyvisual



Leguminosen-Innovations-Workshops



- Interessensvertreter von Anbau bis Konsum
- Austausch und Vernetzung
- Hindernisse und Anreize
- Ansatzpunkte für Veränderungen



Notwendige Veränderungen für mehr Leguminosen-Anbau und –Konsum in Europa



Erzeugung	Märkte	Politik
Regionale Leguminosen-Netzwerke	Verbraucherbildung	Bildung
Monetäre Anreize	Verbraucherverhalten	EU-Agrarpolitik (GAP)
Kommunikation	Transparenz	Ressourcen-Politik
Forschung	Marketing	Forschungs-Politik
(Aus-)Bildung und Beratung	Verarbeitung / Infrastruktur	Bäuerliche und ökologische Landwirtschaft
Agrarökologie als Grundlage für Nachhaltigkeit	Ausreichendes Angebot	Handels-Politik und Marktregulation
Erzeugergemeinschaften	Futtermittelmarkt	Koheränz der Politiken





General contact information

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Universität Hohenheim, Stuttgart

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Email: info@true-project.eu

Facebook/Twitter: [@TrueLegumes](https://www.facebook.com/TrueLegumes)



TRansition paths to **s**ustainable legume-based systems in **E**urope (**TRUE**) has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 727973

