



TRansition paths to sUstainable legume-based systems in EEurope

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*Legume Innovation Network (LIN) – Atlantic Region - Workshop
Wednesday 3rd March '21, TEAGASC-online*





- [TRUE Legume Innovation Network \(LIN\) workshops – reports freely available on-line](#)
- [24 Case Studies \(full write-ups\)](#)
- [TRUE-BLOG , 'Notes from the Field'](#)
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- [Scientific peer-reviewed papers](#)
- [Publicly available reports to the EU](#)
 - *Novel products*
 - *Market opportunities & barriers*
 - *Environmental impact (of diets)*
 - *Economics*
 - *Policy*
 - *Decision support tools*



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Integrated policy analysis to identify transformation paths to more-sustainable legume-based food and feed value-chains in Europe

Bálint Balazs , Eszter Kelemen , Tiziana Centofanti , Marta W. Vasconcelos  & Pietro P.M. Iannetta 

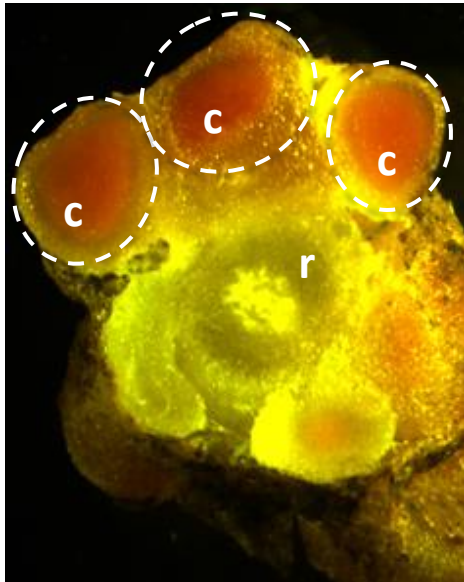
Published online: 28 Feb 2021



Legumes: what's not to like?



Cross-section of **white lupin seedling root (r)** and **surrounding nodules (dashed ellipsoids)**, showing the pink (leghaemoglobin), rhizobial infected (i.e. nitrogen fixing) **nodule cores (c)**.



A nodulated root system of **soybean (*Glycine max* L.)**



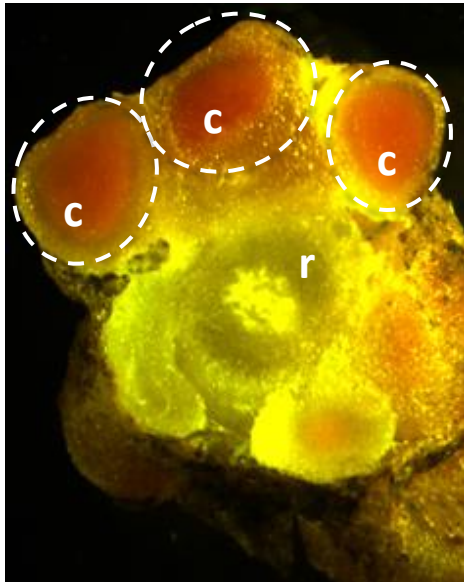
A well-nodulated root-system of **field bean (*Vicia faba* L.)**



Legumes: what's not to like?



Cross-section of **white lupin seedling root (r)** and **surrounding nodules (dashed ellipsoids)**, showing the pink (leghaemoglobin), rhizobial infected (i.e. nitrogen fixing) **nodule cores (c)**.



A well-nodulated root-system of field bean (*Vicia faba* L.)



A nodulated root system of soybean (*Glycine max* L.)



Legumes make multifunctional provisions, and if well managed can

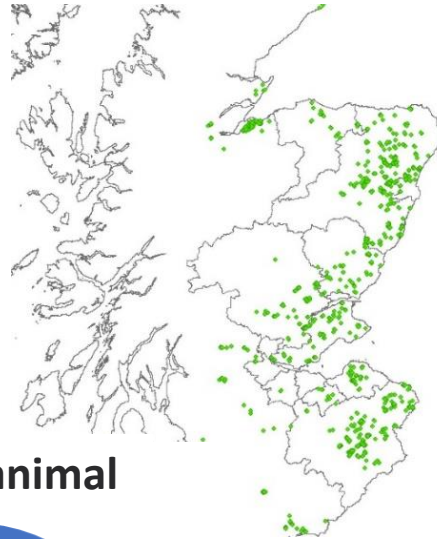
- Help pollinators & beneficial insects
- Diversification and biocontrol agents (pesticide reduction)
- Improve soil-qualities, -diversity and so -function
- Gift nitrogen to non-legumes (inorganic N-fertiliser offset)
- Help liberate soil phosphorous
- Offer highly nutritious food and animal feeds
 - Protein & energy (carbohydrate)
 - High fibre and resistant-starch (low glycaemic index)
 - Essential-amino acids and -minerals
 - “Non-nutritionals” – antioxidants *etc*



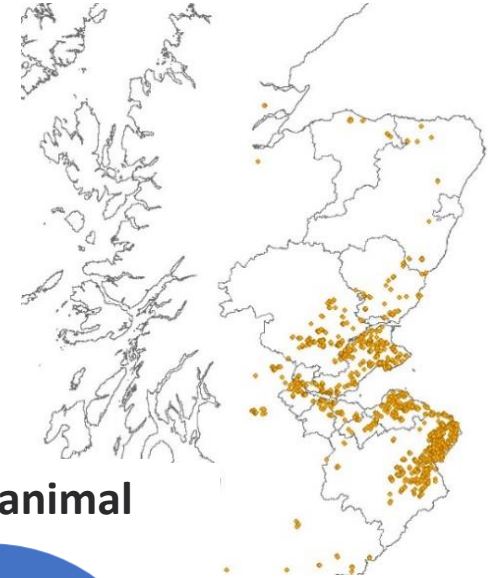
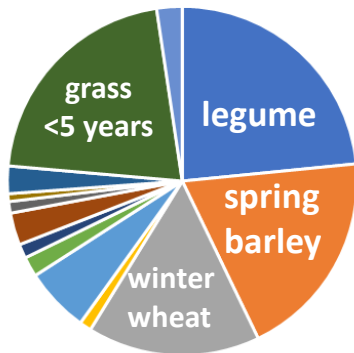
Grain legume supported crop rotations in Scotland



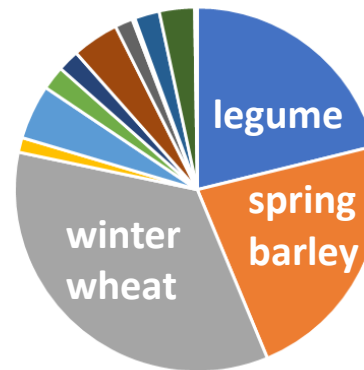
Grain legume cultivation <1 % of arable ground cover in Scotland



Peas - animal



Beans - animal



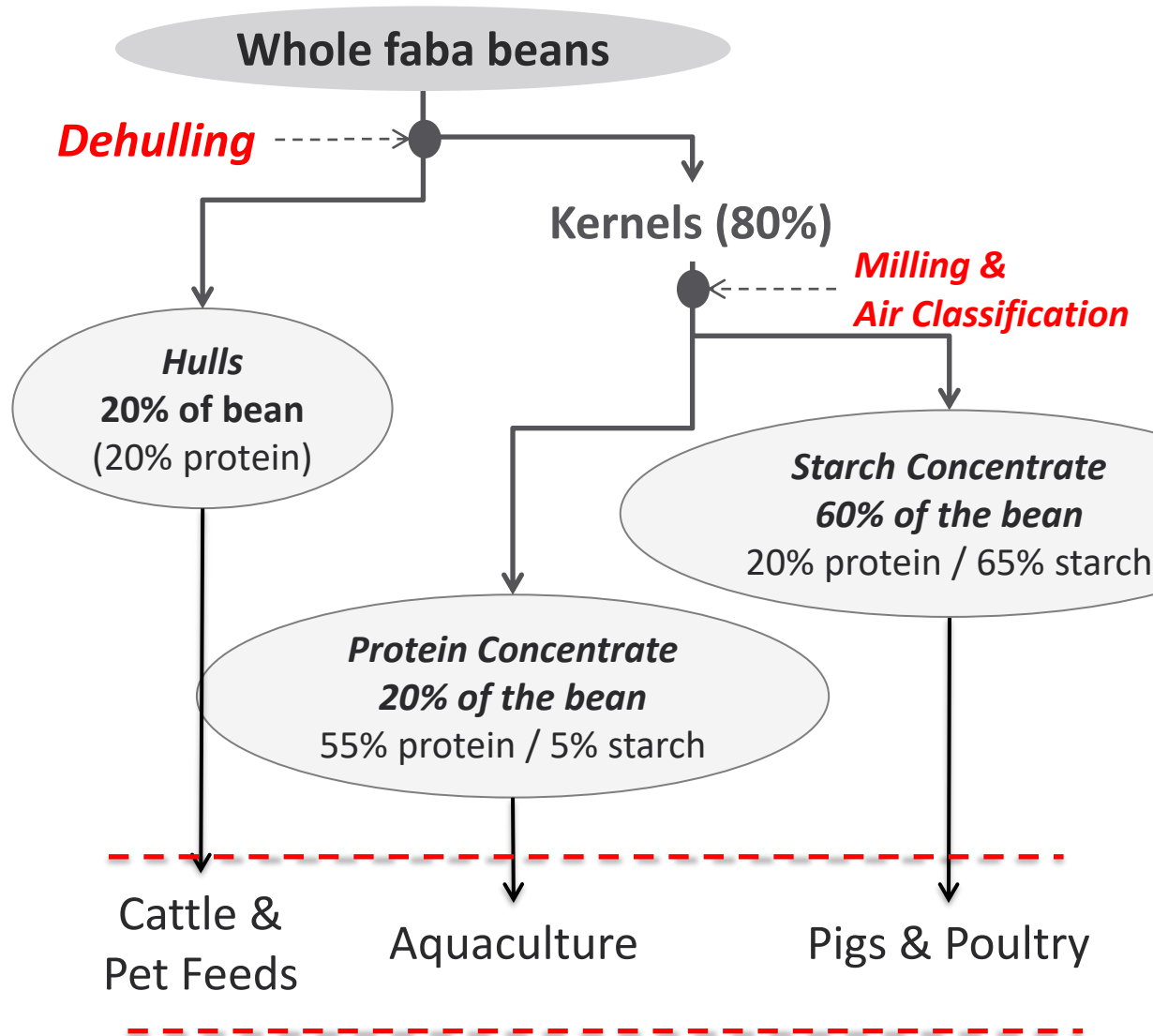
Q - Why is the % of grain legume cultivation so low?

.....
on Institute, TRUE-Project Coordinator



Increasing the value of pulses

- *the parts are worth more than the whole*

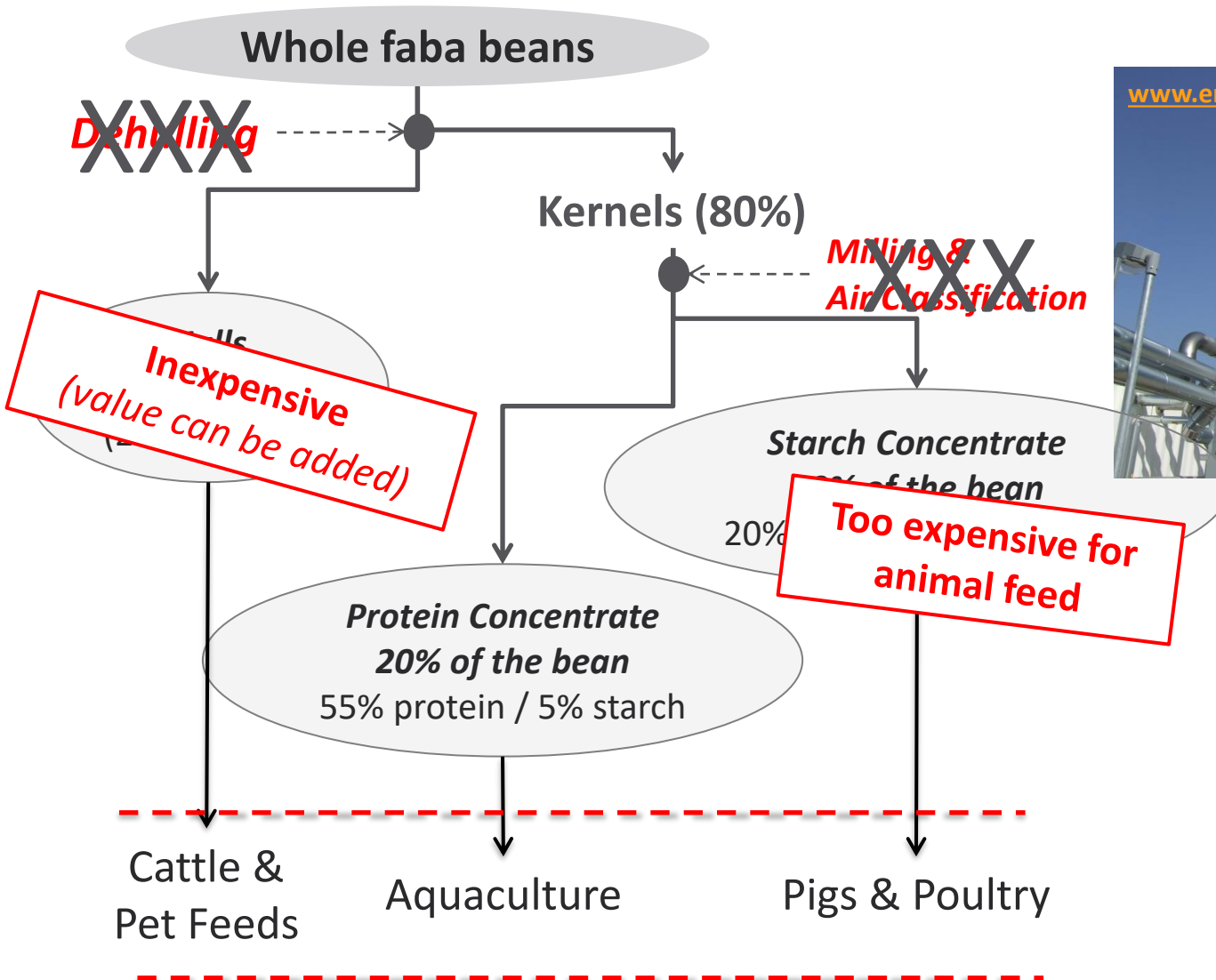


Air fractionation facility:
separating dehulled beans to
starch and protein
concentrates



Increasing the value of pulses

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Air fractionation facility:
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Select faba bean varieties with high protein content?



- **4 high protein lines with good yields**
- **1 early flowering dwarf type "The Scottish Bean"**
- All lines sent to Uni. Saskatchewan (Canada) for further breeding



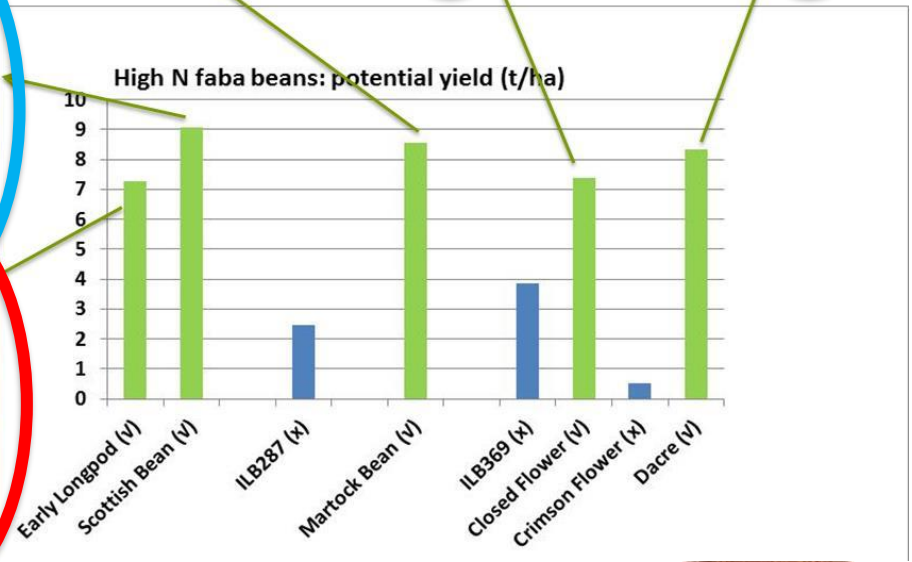
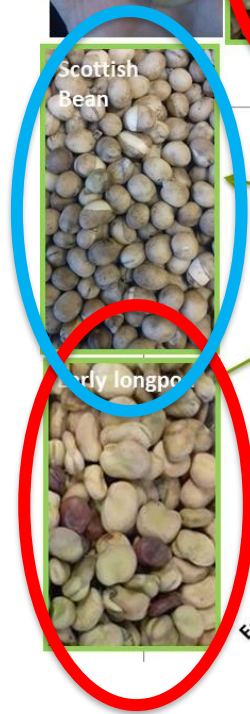
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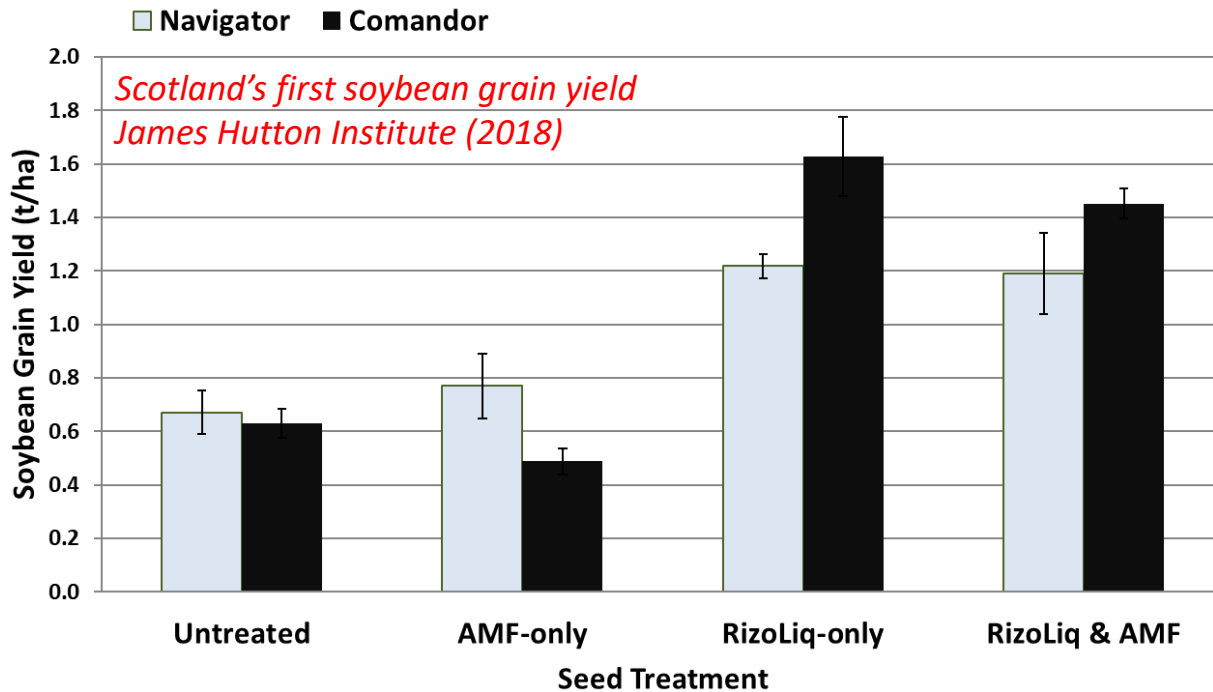
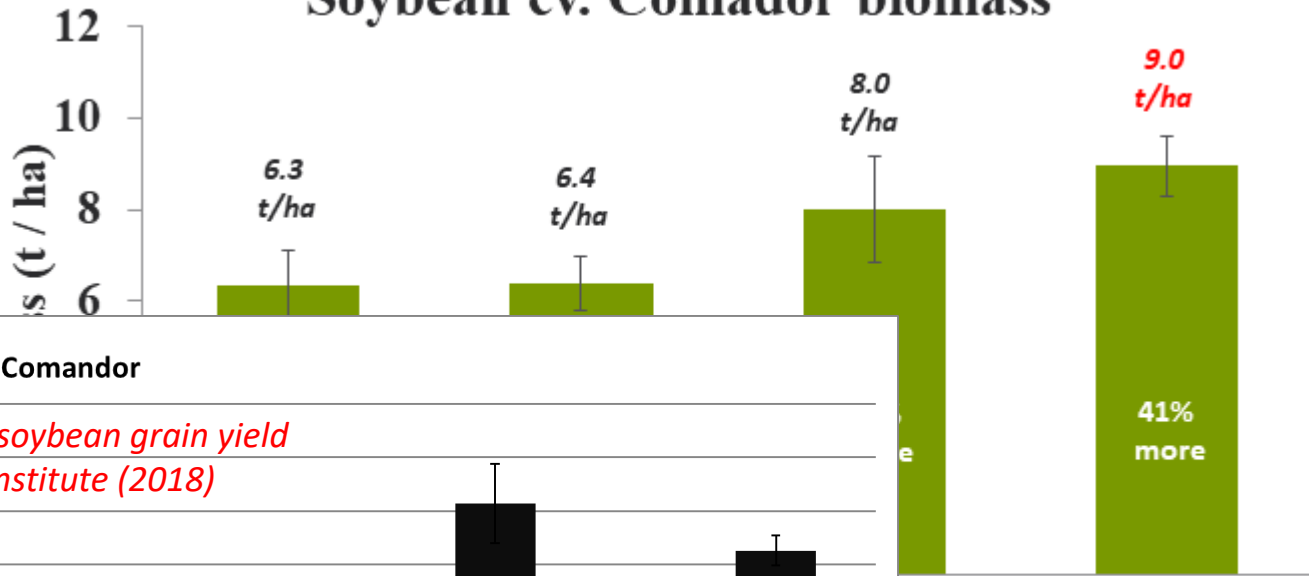
Develop novel crops (for Scotland)



Develop novel crops (for Scotland)



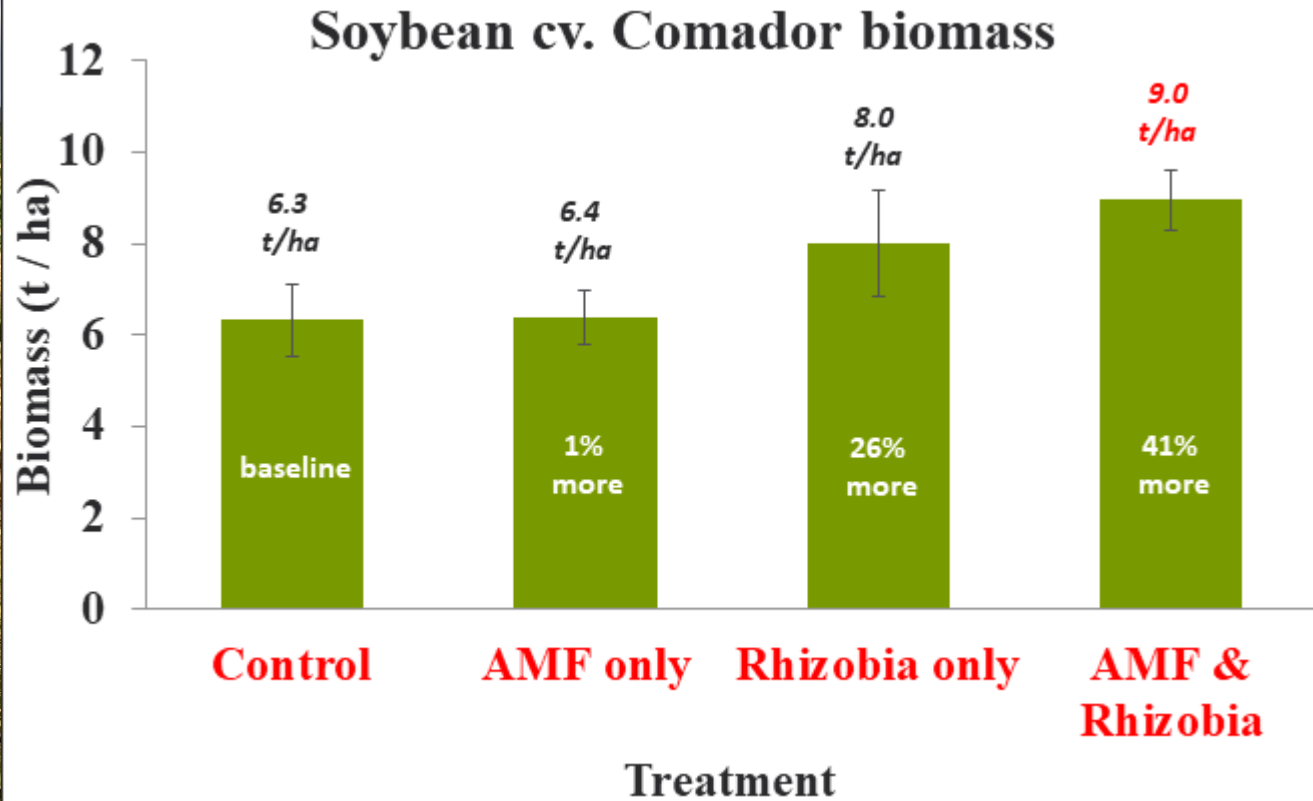
Soybean cv. Comador biomass



a only **AMF & Rhizobia**



Develop novel crops (for Scotland)



Research article | Open Access | CC BY

Optimised processing of faba bean (*Vicia faba* L.) kernels as a brewing adjunct

Kirsty Black, Athina Tziboula-Clarke, Philip J. White, Pietro P.M. Iannetta, Graeme Walker

SUSTAINABILITY SPOTLIGHT
 Could pea gin lead a new generation carbon neutral spirits?

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07.10.19 | WORLD CHANGING IDEAS
 Would you drink pea gin if it helped solve climate change?

Scientists say switching from wheat to peas as the base for gin offers significant environmental benefits.



nature climate change
 research highlights

AGRICULTURAL EMISSIONS
 Benefits of a pea and tonic
 Environ. Int. 130, 104870 (2019)



CoolBeans® Faba bean IPA
 (gluten free, vegan)



Brewers Spent-Grains

- Currently: brewers pay for uplift, for AD
- Future?
 - *barley-bean coproduct trialled as poultry feed*
 - *spent grain & potale - for food (not just feed)*

Distiller uses peas to make 'climate positive' gin

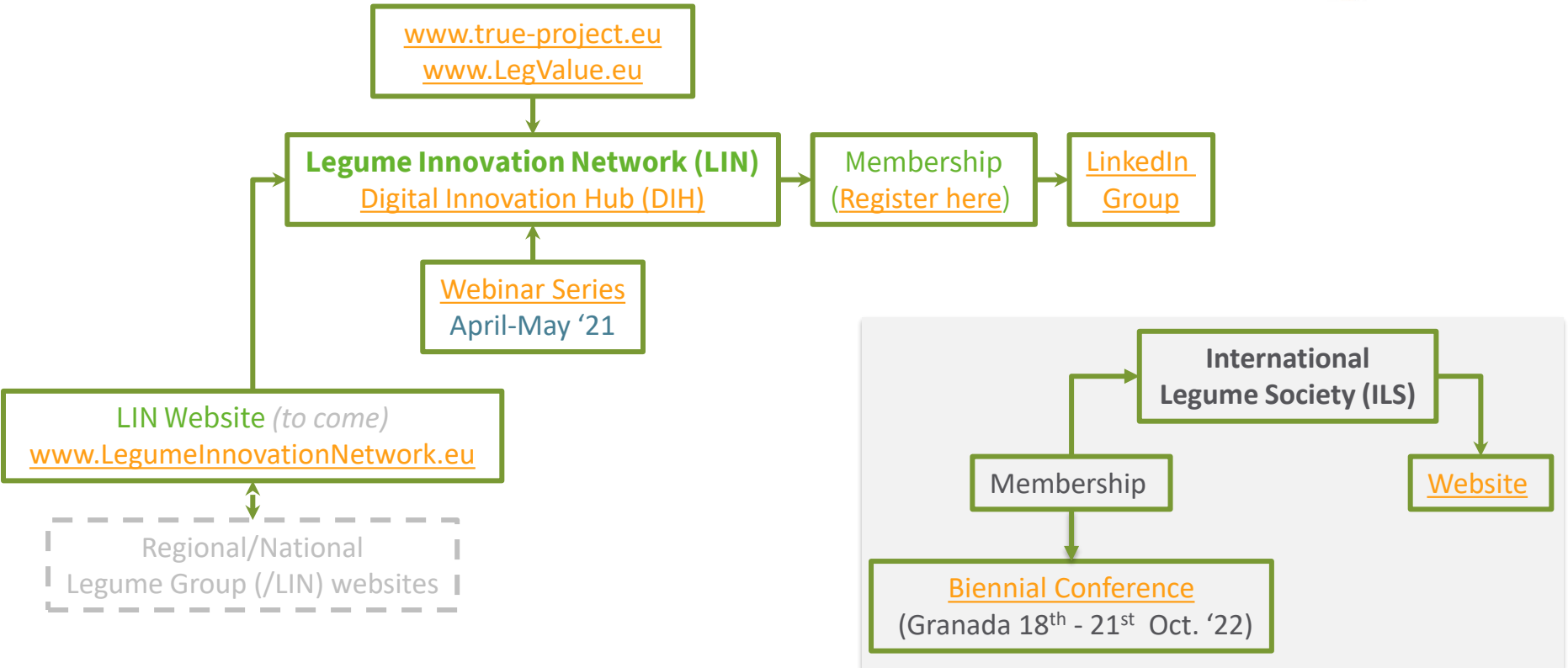


Scottish scientists claim to have developed the world's first "climate positive" gin, using garden peas.



Legume Innovation Network (LIN)

- after the TRUE-Project ends...



Primary objective of the LIN: to connect legume-focused businesses and facilitate knowledge-exchange and sustainable commercial development.

Who can join? Any one, or existing groups, with the common interest of helping realise sustainable legume-supported agri-food systems.





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