



Plant based proteins: Opportunities and Challenges

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Core ambition ?

Deliver novel value opportunities from plant protein crops, focus on circularity and value chain resilience

More value from what is already produced

Why do we need to do this ?

- Plant-protein market is not fit-for-purpose
- Current systems focus on animal feed sector
- Void of premium supply chains
- Real value potential of what farmers produce remains unrealized
- But, societal awareness for alternative sources of dietary protein
- Little consideration to nutrient capture, circularity and climate resilience
- Demonstrate potential of protein crops as pathways to new business models
 - Right crop, Right place, Right market (= diversification)
 - Enable/evaluate innovative processing

What do we produce ?

Feed source	Crude Protein Range
Grass silage	11 - 13%
Red Clover*	16 - 20%
Wheat / Barley / Oats	8 – 18%
Maize silage	8 - 9%
Beans *	26 - 29%
Peas*	24 - 26%
Lupins*	34 - 48%

* *Legume crop – fixes Nitrogen for biomass production*

- Tillage area 2023 ~340,000ha, ambition to get to 400,000ha
- Protein area 2023 = 16,000ha
- Theoretical area = 70,000ha
- Protein crops: beans, peas, lupins
- Agronomy is key to delivering yield potential
- Cropping is a high risk investment

What do/can we produce ?

- Beans – dominates, suitable. High yield potential (~ 6.7t/ha)
- Peas – High yield but susceptible to lodging
- Lupins – High protein but low late harvest
- Soya - Current varieties fail to mature under Irish climate
- Variety choice is critical for:
 - Climate
 - Yield potential (V x E x M)
 - Protein potential ?



Many unanswered ‘?’

Producers



Can I maximise return from my protein crop?

What is the best crop to grow in my region?

How can I maximise yield/quality potential?



Processors



Do I need to invest in a plant processing facility?

From where can I get a consistent supply of raw material?

What technologies should I use?



Food manufacturers



Is there a market for plant based products?

What products can I make?

Is there a consistent supply of ingredients available?



- New novel protein products
- Biomass transformation products
- LCA /Kg Protein
- Legumes/pulses in MACC curve as CO₂ mitigation measure

Case Study 1 - Fava Beans

- Protein profiling of varieties
- Protein extracted via 2 processes, extraction process optimised
- Protein levels achieved > 90% protein
- Assessing impact of:
 - Pre-processing/dehulling on compositional, techno-functional, thermal and structural properties of fava protein extract
 - Fava bean protein as gel enhancer to improve the quality of food matrices
 - Microbial biobank for biotransformation
 - 2 strains identified for production of lactic acid from residual biomass



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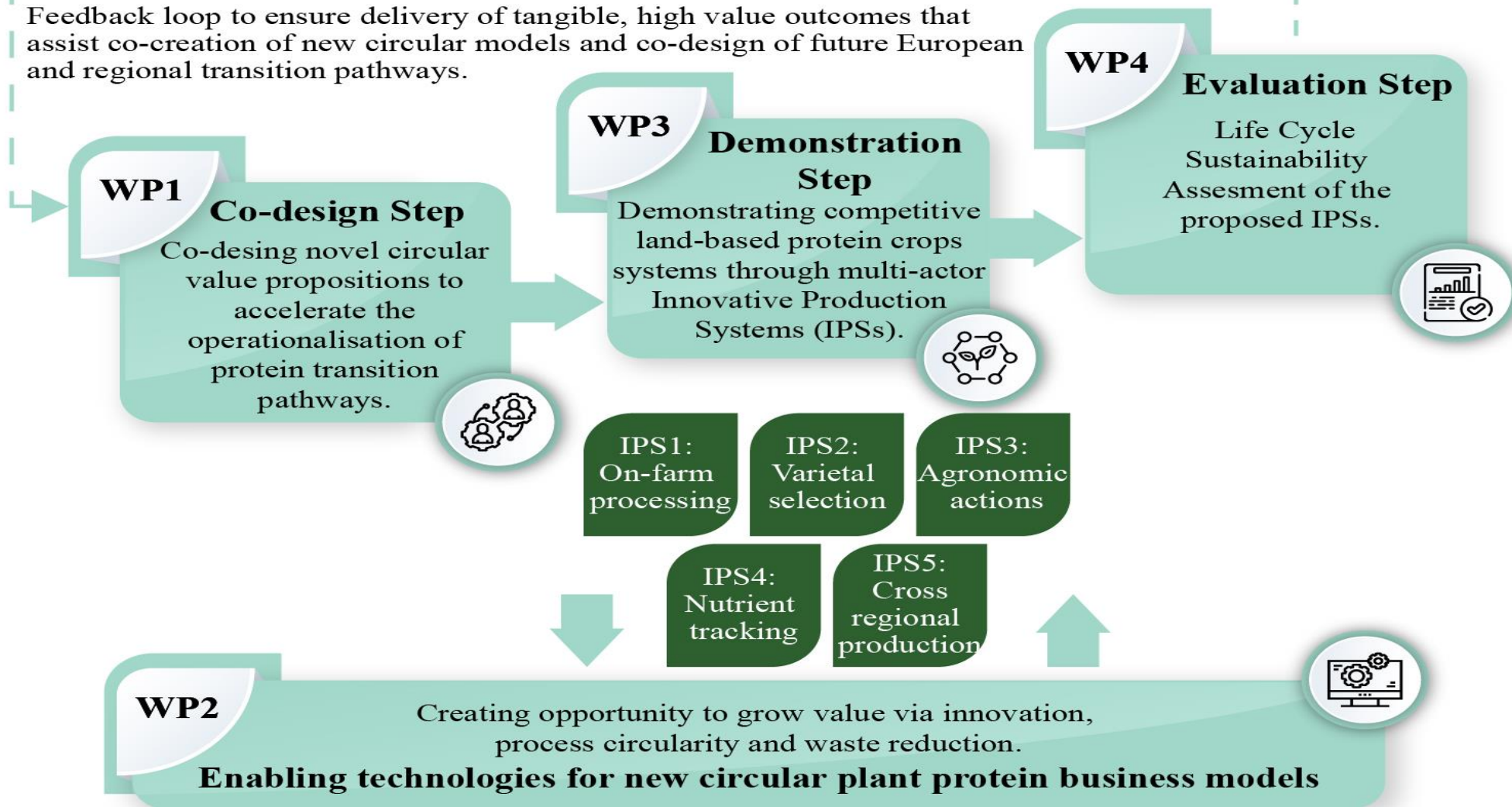
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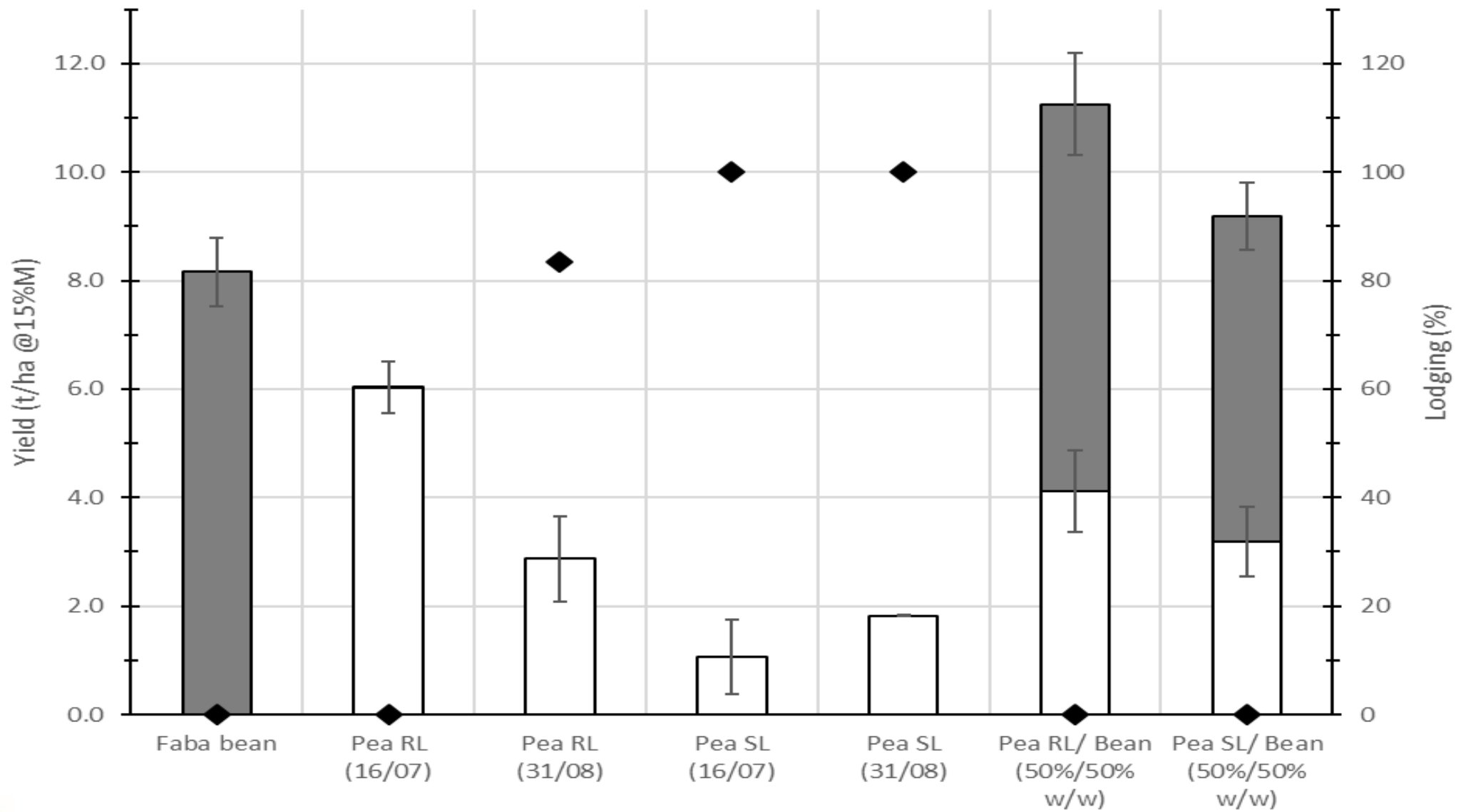


Feedback loop to ensure delivery of tangible, high value outcomes that assist co-creation of new circular models and co-design of future European and regional transition pathways.



IPS 3: Agronomic actions in practise...

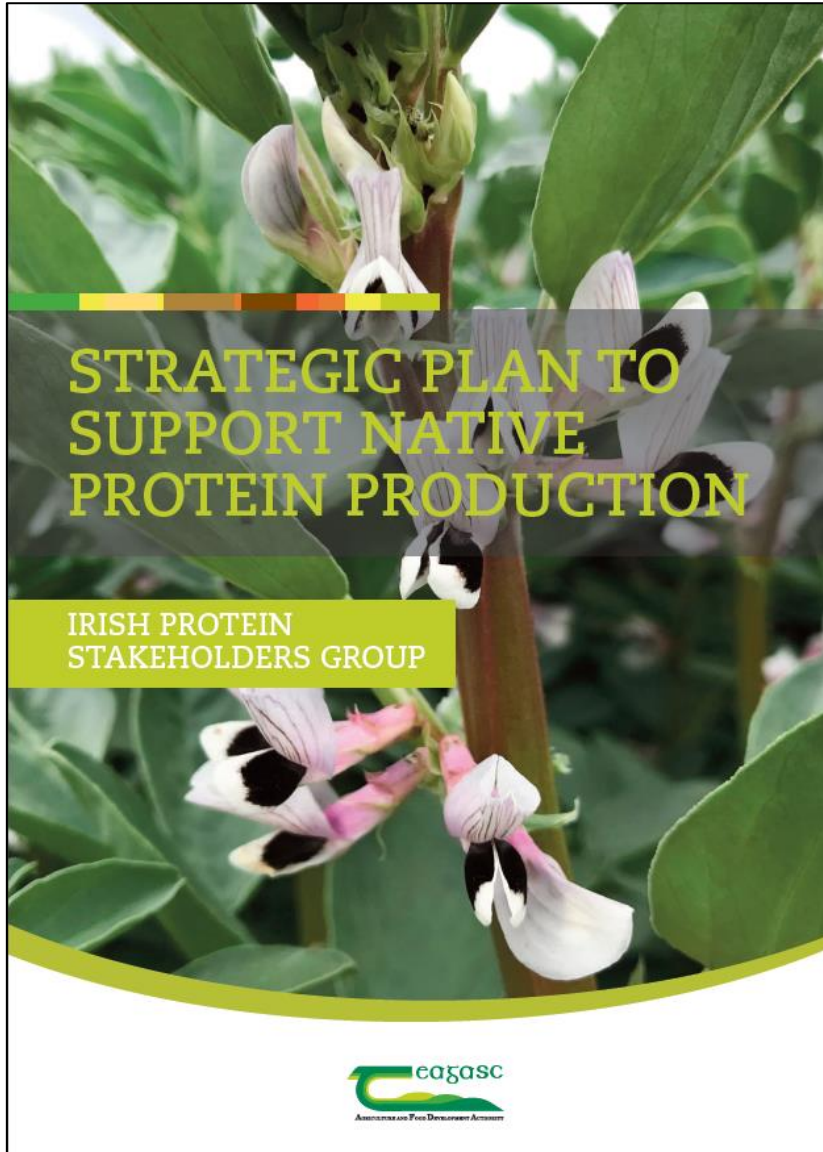
Sole crop (field pea)				
Mixed crop (field pea/faba bean)				
Date	22April2020	08May2020	16July2020	08Aug2020





Strategic goal is to produce more

- Target of 20,000ha of protein crops
- ~130,000t by 2030
- Farmer profitability - Improving profitability from protein crops v. other crops
- Creating demand - positive market environment for indigenous protein crops
- Sustainability - Recognition of the sustainability credentials of native grown protein crops v. imported protein sources.





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