Intercrop Farm-scale trials experience to date of the EU ReMIX UK MAP

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Leading the way in Agriculture and Rural Research, Education and Consulting

ReMIX Objectives

SRUC

- Overcome barriers to stimulate the adoption of **species mixtures** by farmers and in agri-food chains
- Unravel mechanisms of **plant-plant interactions** to maximize resource use efficiency
- Determine the role of species mixtures in controlling **diseases, pests and weeds** and alleviating yield damages
- Demonstrate the role of species mixtures in improving **ecosystem service** provision and development of **resilience** to biotic stress
- Identify key traits and create **novel breeding and phenotyping** methods. Generate novel breeding material to grain **legume / cereal** mixtures
- Develop generic rules for assembling species for efficient **cash crop** production using process-based simulation models
- Develop new **management techniques** to optimize species mixtures performance
- Optimize settings and specifications for **agricultural machinery** for harvesting and separating grains
- Develop a toolbox, a **serious game** and technical booklets for **farmers** and **advisors**

www.remix-intercrops.eu

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Species mixtures for redesigning European cropping systems

ReMIX MAP

Multi Actor Participation (MAP) – 11 "hubs" in 10 EU countries

- **"Hub" and satellite farm approach**

The UK MAP context:

- **Current systems (generally):** *Input intensive, short term production orientated, potential soil damage, increasingly erratic weather events*
- **Targets or new expectations:** *Reliable yields but using lower inputs, especially cereals, seed potatoes and home grown protein production (grassland), improved soils - health & structure*
- **What are the main characteristics of the socioeconomic context?:** *Long-term sustainability of business, soils and agricultural productivity*
- **Planned activities on the UK MAP:** *Interaction between farmers (online discussion forum), MAP farm visits, open days / evenings*

Approach @ “Hub site”

Small plot trials based on known / suggested agronomy

- **Basic approach following from previous years RESAS trials**
  - **Discussion with farmer group (EU ReMIX)**
    - **Sowing rate treatment – in mixtures**
- **Yield / quality** sampling regime
  - **Multi-use options** aimed for
    - Biomass, Silage, Combinable grain
  - Feeding value
    - Analysis of micro-silage
    - Pulse use in animal feeding studies

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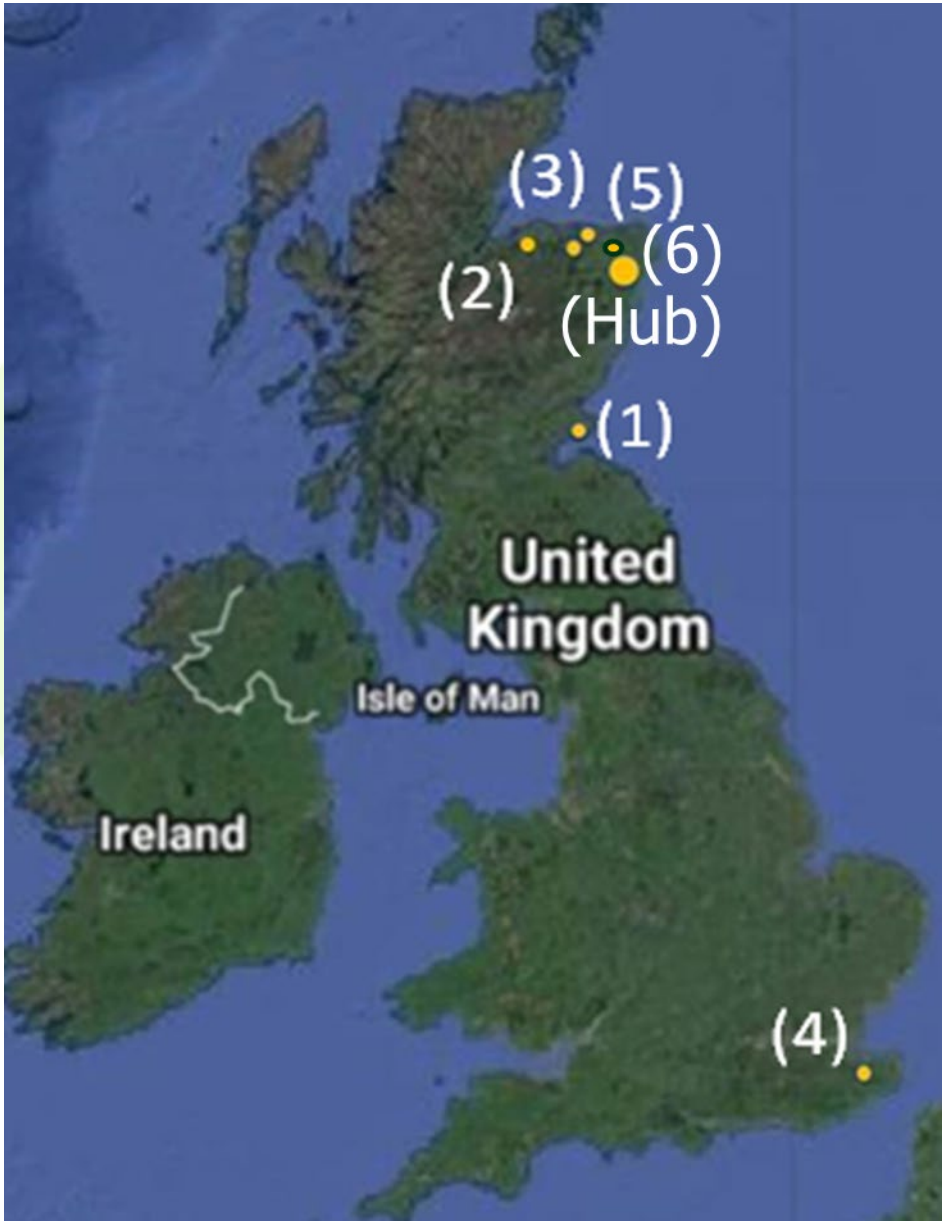
Recruitment of farms & communication lines

- **ReMIX presented**: by SRUC at several of their own and third party events (like this since May 2017)
  - E.g. demo at Cereals in Practice, Soil Association Innovative Farmers Field Labs, SOPA meetings, SRUC advisory service meetings

- Follow up **emails** and **phone exchanges** with farmers & other interested parties (e.g. processor)
  - **Conventional and organic** - all have experience of intercropping – 2 farmers have intercrops on both organic and conventional land

- **closed Facebook Group** - easier flow of information

Location of ReMIX MAP Farms



How are the farms involved?

- **How are crop mixtures chosen and who proposed them?**
  - *Farmer orientated with suggestions from other MAP participants*
- **What are your questions on the crop mixtures?**
  - *Different for each farm (based around targeted end use)*
- **Are they the same for each satellite farmers?**
  - *No, each farm chooses a crop mixture that fits in with their rotation and level of risk they are prepared to take, and which market is targeted*
- **What knowledge is available?**
  - *Some research available from SRUC and wider afield including other farmers (√), alternative options for regional climate / soils (limited), herbicide options (limited), overcoming harvesting difficulties (limited)*

Many intercrops in the MAP - currently all spring sown

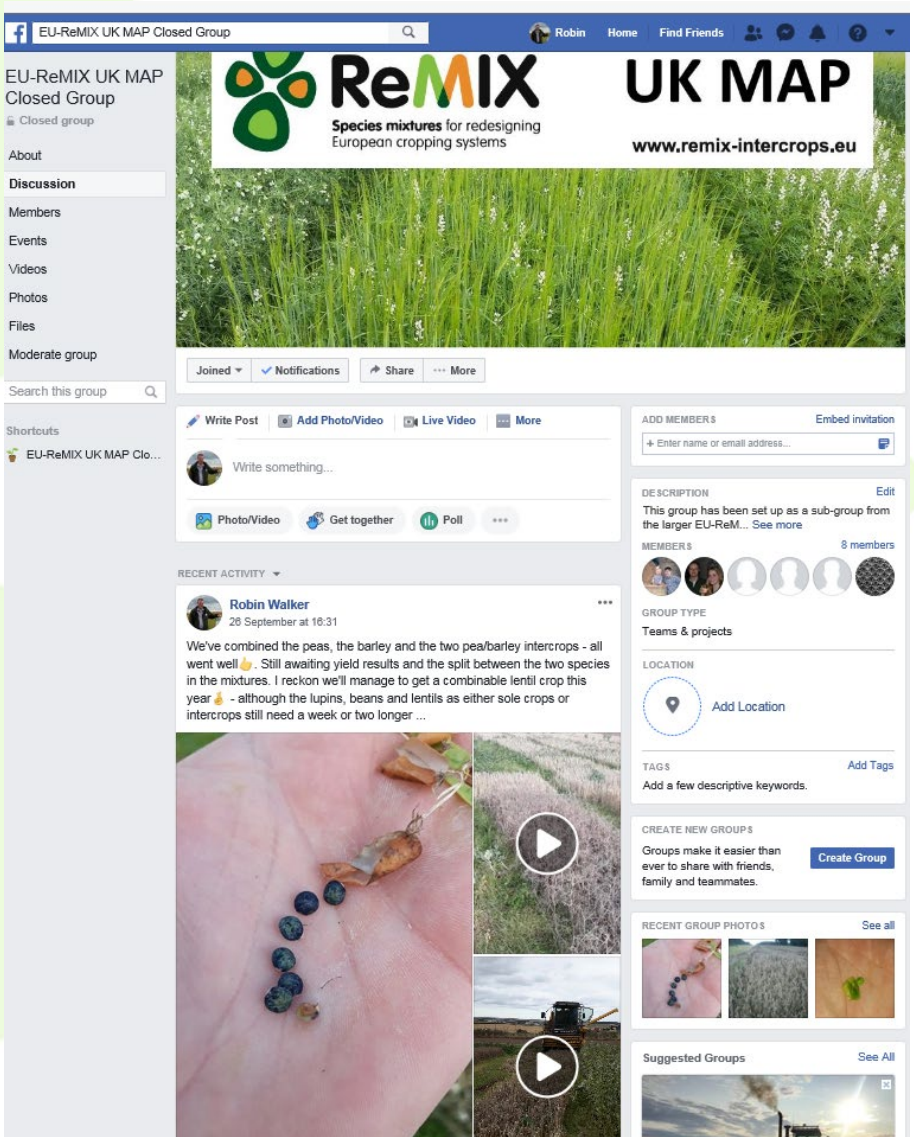
Central "Hub"

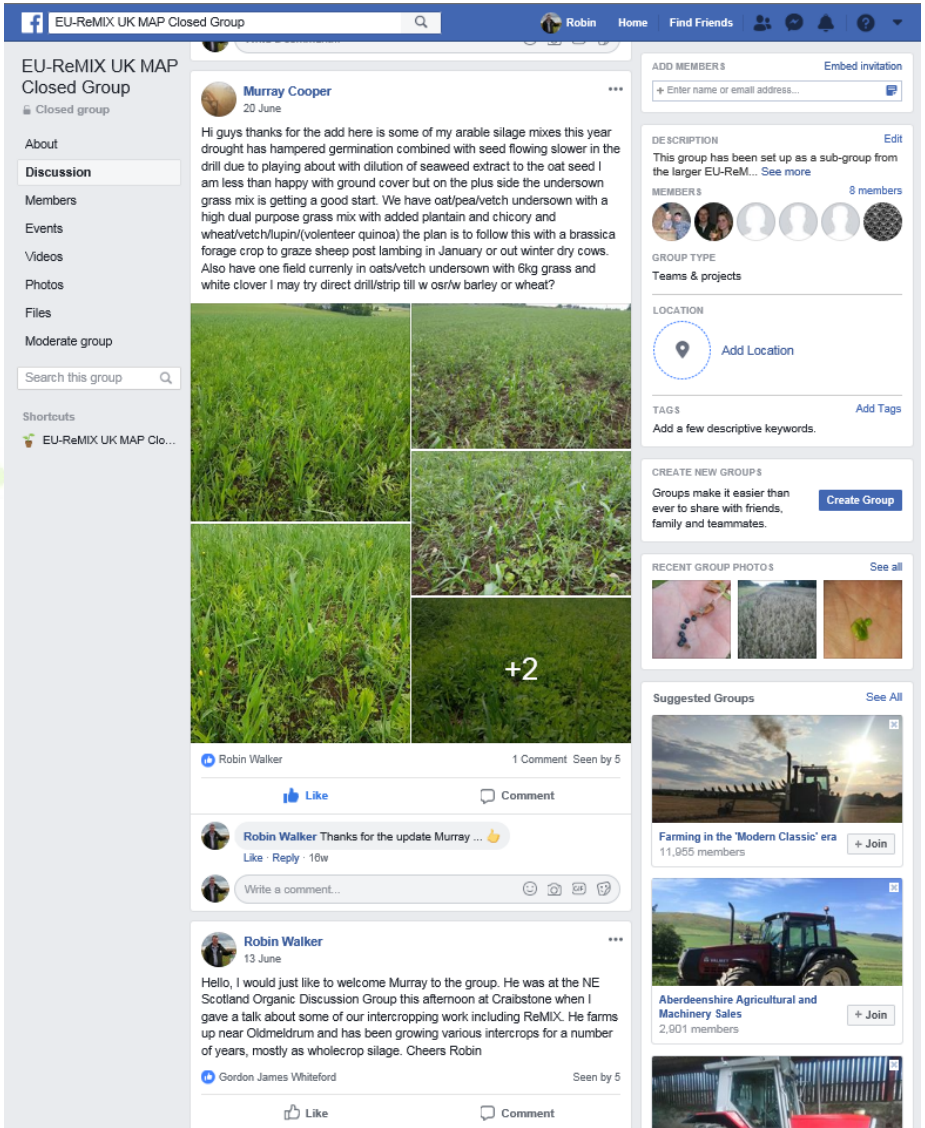
- Peas, beans, lupins, lentils - sole cropped (except lentil) and with spring cereal – different ratios (60/40 & 40/60) tested

Satellite farms (O = organic; C = conventional)

- **(1)** Beans & oats (O and C); Peas, OSR & oats (C); Barley & OSR (O); Barley, strawberry clover, white clover, yellow trefoil (C).
- **(2)** Peas & barley (O & C) – with sole pea & barley crops
- **(3)** Peas & wheat (O)
- **(4)** Beans & OSR (C); Oats & clover (C); Lentils & flax (C)
- **(5)** Pea & barley (O); Pea & wheat (O), Barley & wheat (O); Barley, wheat & peas (O); Barley, wheat, peas & vetch (O) – with sole barley, wheat & pea crops
- **(6)** Oat, pea, vetch u/s high dual purpose grass mix, chicory & plantain; Wheat, vetch, lupin (& volunteer quinoa); Oats, vetch u/s grass & white clover

EU-ReMIX UK MAP Closed Group - communication channels





Data sheets requested from farms

- Time availability is a key resource so to keep things simple …
  - Basic semi quantitative information on crops either intercrops, or sole crop components (in adjacent stands) -
    - Germination (1-9 scale)
    - General stand (1-9 scale)
    - Yield estimate (t/ha)
    - Protein content (%)
    - Pest issue (1-9 scale)
    - Disease (1-9 scale)
    - Flowering time (1-9 scale)
    - Ripening (1-9 scale)
    - Lodging risk (1-9 scale)
  - Still awaiting data from farms who are pooling it together

Benchmark options

Peas - spring barley

Pea sole cropped

Pea-barley intercrop

Lupins - spring barley

Lupin sole crop

Lupin-pea intercrop

Beans - spring barley

Faba bean sole crop

Faba bean-barley intercrop

Lentils with spring oat scaffold

Anicia

Gotland

Thanks for your attention

SRUC

- Thanks to many colleagues CSS
- and thanks to Scottish Government (RESAS) and EU ReMIX for financially supporting this work

The Scottish Government
Riaghaltas na h-Alba

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