



National Sheep Association
Scottish Region

NSA Scotland ARMM
19th February 2025



SRUC

Technology & sheep farming

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Centre

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EU projects



2 Horizon 2020 projects + 1 new HorizonEurope project



Integrating innovative **Tech**nologies along the value **C**hain to improve small ruminant welf**ARE** management

Sept 2020– August 2025

www.techcare-project.eu

<https://zenodo.org/communities/techcare/records>



Sm@ll Ruminant Technologies – Precision Livestock Farming & Digital Technologies for Small Ruminants

January 2021 – Sept 2024

www.smartplatform.network

https://zenodo.org/communities/small_ruminant_technologies/records



Digital innovation & data technology network for Rangeland livestock farming systems

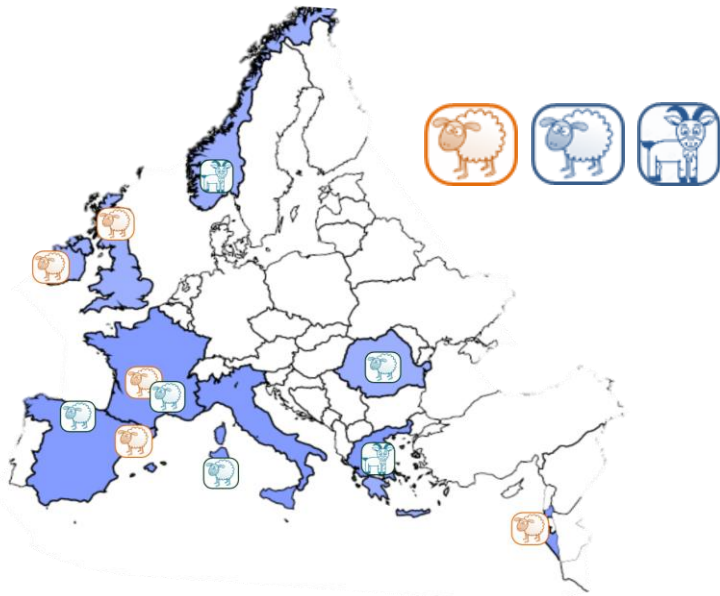
February 2025– January 2029

Website TBC

<https://cordis.europa.eu/project/id/101183132>

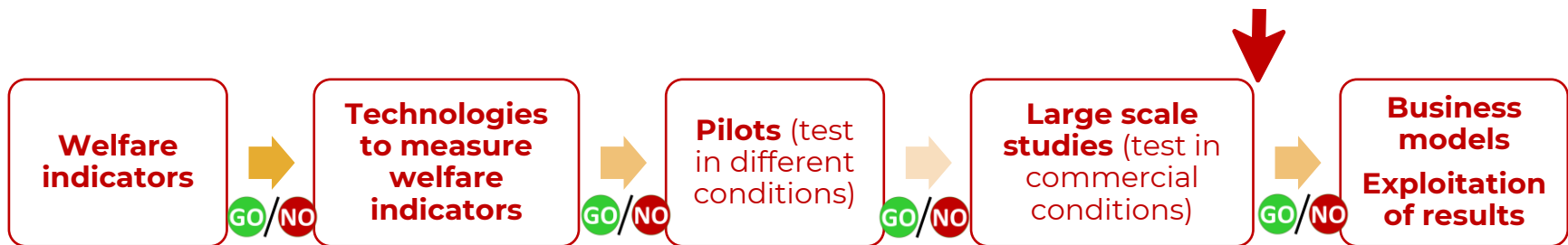
The TechCare project

Integrating innovative **TECH**nologies along the value **C**hain to improve **small ruminant** welf**ARE** management



5 key steps

1. Prioritise welfare challenges and issues
2. Identify potential innovative technologies solutions
3. Validate the solutions in different and real conditions (pilots and commercial farms)
4. Define appropriate business models
5. Communicate widely the results to the small ruminant sectors and beyond



Outputs



2 main outputs :



Technologies ready to implement on farms/value chain, to improve welfare management

'Low-cost' & relevant to most small ruminant farmers



Technologies not yet acceptable entirely to whole industry:

- I. Only available to innovative farmers
- II. Still to be developed

- Guidelines/blueprints on technologies use
- Alerts
- Incubator seminar for technology developers



Small ruminant welfare monitoring/management



Outputs



- ❑ Welfare priorities lists
- ❑ 4 sets Welfare assessment guidelines
- ❑ 4 broad categories of welfare indicators
- ❑ 13 potential technologies tested on pilot farms
 - ❑ Kirkton: BLE beacons & readers / UHF tags
 - Proximity to feed resources



Antennas

Visual tag for ID
UHF tag on top



UHF suitcase reader
(in waterproof box + power bank battery & 4G modem)

High energy feed block (molasses)

1 month trial: mid-January to mid-February 2023: Winter feeding

50 Lleyn ewes on ~20 ha rough grazing

Outdoor/extensive settings

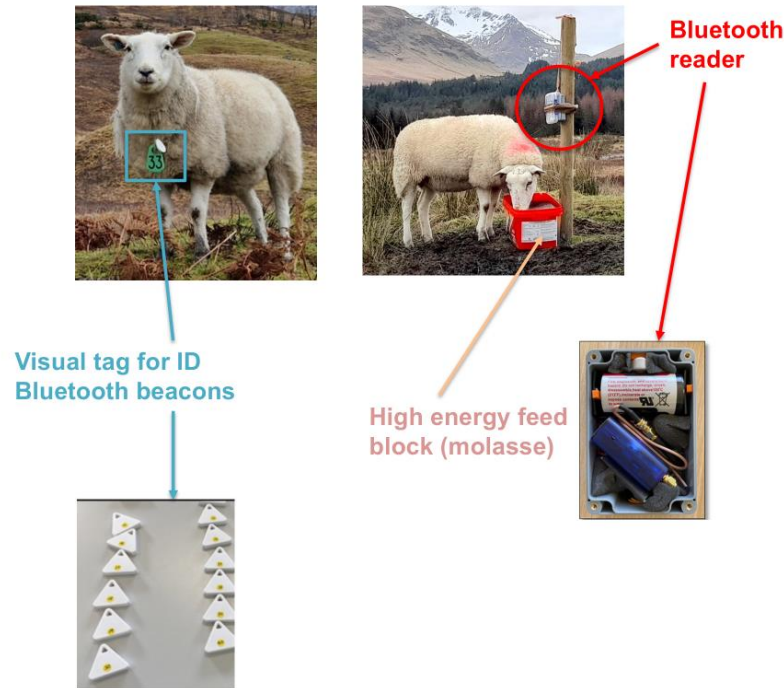
Data collected:

- Weighed & BCS at start, finish & mid-point
- Welfare assessment (AWIN) in pens & outside
 - Lameness score
 - Fleece score
- UHF data collected with PageUp system:
 - Only 8 hours (daylight) per day
 - Not at week-end (issues of battery)

Outputs



- ❑ Welfare priorities lists
- ❑ 4 sets Welfare assessment guidelines
- ❑ 4 broad categories of welfare indicators
- ❑ 13 potential technologies tested on pilot farms
 - ❑ Kirkton: BLE beacons & readers / UHF tags
 - Proximity to feed resources



2 months trial: mid-January to mid-March
2022: Winter feeding

100 ewes on ~50 ha rough grazing

Outdoor/extensive settings

Data collected:

- Weighed & BCS at start, finish & every 2 weeks
- Welfare assessment (AWIN) in pens & outside
 - Lameness score
 - Fleece score
- Bluetooth data (RSSI) collected with WISP system via LoraWan:
 - Every 5 min
 - Record 16 nearest beacons

Outputs



- ❑ Welfare priorities lists
- ❑ 4 sets Welfare assessment guidelines
- ❑ 4 broad categories of welfare indicators
- ❑ 13 potential technologies → 4 tested on commercial farms:

- EID weighcrate + reader(s)
- Electronic milk meter
- Milk tank weight
- Weather station/indoor sensors

- ❑ 3 alerts being developed:

- Milking order
- THI
- Weight change

- ❑ 3 platforms:

- ❑ Breedr app for welfare assessment
- ❑ Abinsula web platform – data monitoring, algorithms & alerts (dairy sheep)
- ❑ THicare App

Techcare Scores

Activity Datetime	Farm	Category	Passport Number	EID	Score Type	Score Value
Dec 13, 2024 2:42pm	Caoussarel	Dairy Sheep			Flock Cleanliness	?
Dec 13, 2024 2:42pm	Caoussarel	Dairy Sheep				
Dec 13, 2024 2:42pm	Caoussarel	Dairy Sheep				
Dec 13, 2024 2:42pm	Caoussarel	Dairy Sheep				
Dec 13, 2024 2:42pm	Caoussarel	Dairy Sheep				
Dec 11, 2024 2:43pm	Caoussarel	Dairy Sheep				
Dec 11, 2024 2:43pm	Caoussarel	Dairy Sheep				
Dec 11, 2024 2:43pm	Caoussarel	Dairy Sheep				
Dec 11, 2024 2:43pm	Caoussarel	Dairy Sheep				
Dec 11, 2024 2:43pm	Caoussarel	Dairy Sheep				
Dec 11, 2024 2:43pm	Caoussarel	Dairy Sheep				
Dec 11, 2024 2:43pm	Caoussarel	Dairy Sheep				
Dec 11, 2024 2:43pm	Caoussarel	Dairy Sheep				
Dec 11, 2024 2:43pm	Caoussarel	Dairy Sheep				

Reports

- PERFORMANCE
 - Flock Health Report
 - On Farm Weights
- SUPPLEMENTARY
 - Techcare Scores

THicare App Interface:

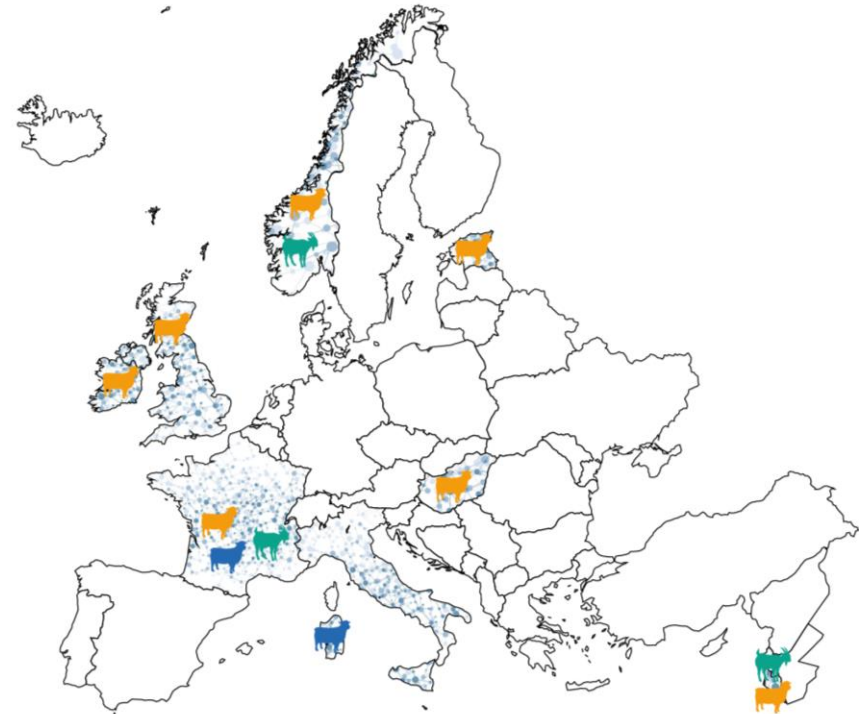
- 9:47
- THI Exterior: 48
- UAB, Bellaterra (Barcelona, ES)
- THI interior (CH1-CH8): 50, 49, 50, 49
- SUPPLEMENTARY: 50, 51, -, -
- Calidad aire interior PM2.5 (CH1-CH2): 16, 17
- Retención agua en camas (CH1-CH8): 21, 26, 22, 21, 31, 25, -, -

Sm@RT – The project



Objectives :

- To create a European **network** around the **use of PLF and digital technologies** in small ruminants
- To encourage **knowledge exchange**, new technologies **adoption** and **communication** between farmers and stakeholders of the small ruminant sectors



Carte réalisée avec Cartes & Données - © Artique



In Extenso
Innovation Croissance

Agris

Eesti Maaülikool
Estonian University of Life Sciences



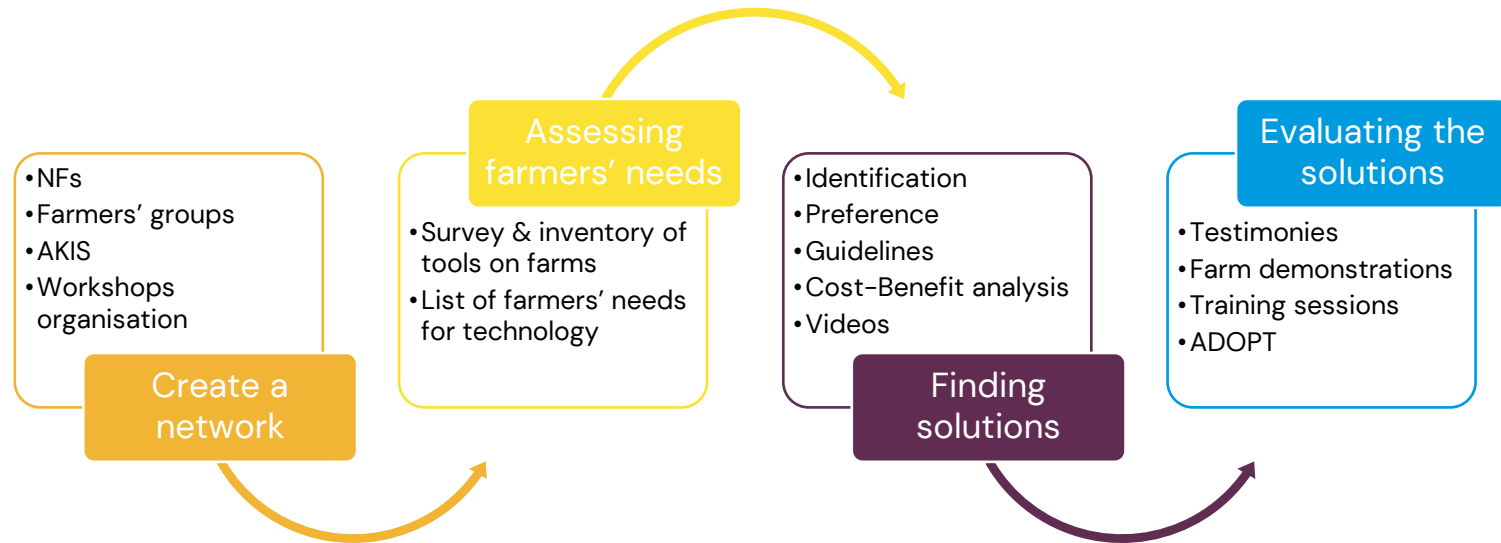
NIBIO



eaqasc



Approach

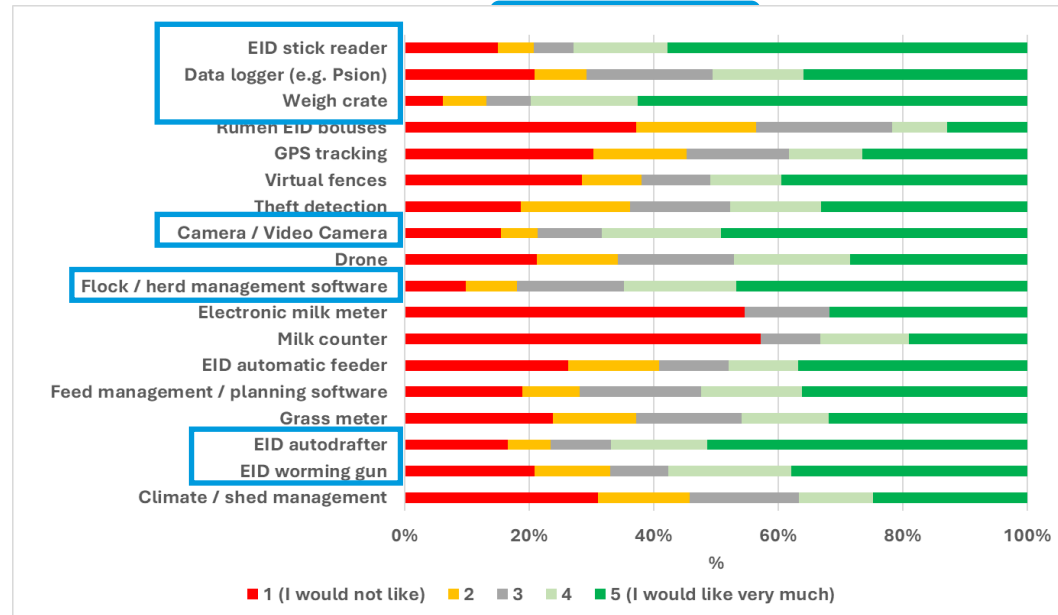


Approach

- NFs
 - Farmers' groups
 - AKIS
 - Workshops organisation
- Create a network**

- Assessing farmers' needs**
- Survey & inventory of tools on farms
 - List of farmers' needs for technology

- 669 respondents
- 166 needs



Themes	Dairy goats	Dairy sheep	Meat sheep
Feeding/Grazing	13	5	17
Health & Welfare	13	10	17
Flock/herd monitoring	10	8	11
Reproduction	9	5	15
Milking/Fattening	8	9	16



Approach



Health/Welfare/Reproduction

EID hand-held wand/data loggers	Data recording system / Flock recording app	EID weigh crate and autosorter	FEC software (FecPak G2)
Pregnancy scanning	Parentage test	Worming /vaccinating gun	Sheep conveyor
Happy Factor algorithm	Camera	Somatic Cell counter	Weather/ environmental station
Water meter	Automatic feeder	Alpha detector	3D imaging
Ultra High Frequency	Walk Over Weigh	Environmental enrichment	EID-enabled water trough
GPS & proximity ear-tags	Guard dog & high tensile fence	Milk feeders for kids/lambs	GPS collars & behaviour information

Finding solutions

- Identification
- Preference
- Guidelines
- Cost-Benefit analysis
- Videos

Evaluating the solutions

- Testimonies
- Farm demonstrations
- Training sessions
- ADOPT

- **68 solutions**
- **30 preferred**
- **30 guidelines prepared**
- **30 cost-benefits analysis**
- **> 20 videos**

Feeding/Grazing

SmartFence/Virtual fence	EID weighcrate + autosorter	Grazing management app	Automated grass measurement
Pregnancy scanning	Ration/Feeding Software	Drone	Portable NIR
Milkmeter	Automatic feeder	Connected Fence	GPS collars
Postdried hay technology	HappyGrass	Drone with thermal camera	GPS collars with behaviour





Sm@RT Ruminant Technologies

EID-enabled Weigh Crate

Need:

- Deciding on feeding groups / links between the state of the animals & feeding
- Auto drafting ewes for nutrition management
- Recognising and/or weighing your sheep automatically
- Lamb weighing (in barn and also in pasture)
- Animal sorting, manipulations, moving
- Drafting fat lambs / lambs to keep
- Timely weaning

Aim:

To help and/or improve flock management, during a number of different tasks throughout the production year, using a weigh crate that can read the electronic identification (EID) ear tag/bolus of an animal.

Description:

A weigh crate that has EID reading capabilities which, when combined with an electronic weigh head, can identify each animal when it is weighed by its EID ear tag / bolus. These systems can be fixed in one position or included in mobile handling systems.

How to Implement:

Depending on the capabilities of the electronic weigh head used, weigh data and additional information can be recorded and stored on the weigh head. If the weigh crate is an auto-drafter, the weigh head can automatically draft animals into pre-determined groups. If the weigh crate is not an auto-drafter, the weigh head can advise which direction the animal should be drafted to (which the user then does manually).



Country:
UK



Production System
(dairy or/and meat
sheep/goat):

Meat sheep

Category of Animal
(ewe, goat,
replacement, lamb,
kid):

All

Source of
Information:

Attachment/Links:

Sheep electronic
identification at SRUC
- youtube

<https://www.youtube.com/watch?v=cwS4ji8nRLs>



How to Implement (cont'd):

Data can then be downloaded on to a computer. Ideally when setting up the weigh head, information relating to all animals in the flock is uploaded (for example their EID tag/bolus number, sex, breed, year of birth, management group etc.).

Before each weighing session, the user should decide what drafting criteria they wish to implement. Examples include criteria can be based on the weight of each animal (for example over a certain weight for identifying animals ready for slaughter); the pregnancy scanning result for each animal (splitting animals in to different feeding groups based on the number of foetus identified at scanning); the body condition score of the animal (for example splitting leaner animals into a separate group for preferential feeding) or by management group (for example identifying individual ewes to go in to certain mating groups).

Once the weigh head has all the information entered that the criteria set requires, it will either auto-draft the animal into the correct pen or it will indicate which pen the animal should go to.

Expected Benefits:

- Improved flock record keeping
- Data collected for each individual animal.
- Labour and time saving
- Reduced stress and handling
- Improved flock efficiency
- Improved health and welfare
- Useful for breeding programmes

Costs and Challenges:

- All animals must be EID tagged (~1.20 € each)
- Suitable handling facilities
- Power supply (main or battery)
- Purchase costs can vary considerably (from simple manual weigh crates and weigh heads to crates with auto-drafting capabilities and more complex weigh head capabilities – from 5,000 € to 15,000 €)
- Requires training to get the most from the system
- There is no technical support on farm after purchase



This tech works for me because it is fast to use and gathers a lot of data in a short amount of time.

FARMER FROM THE UNITED KINGDOM



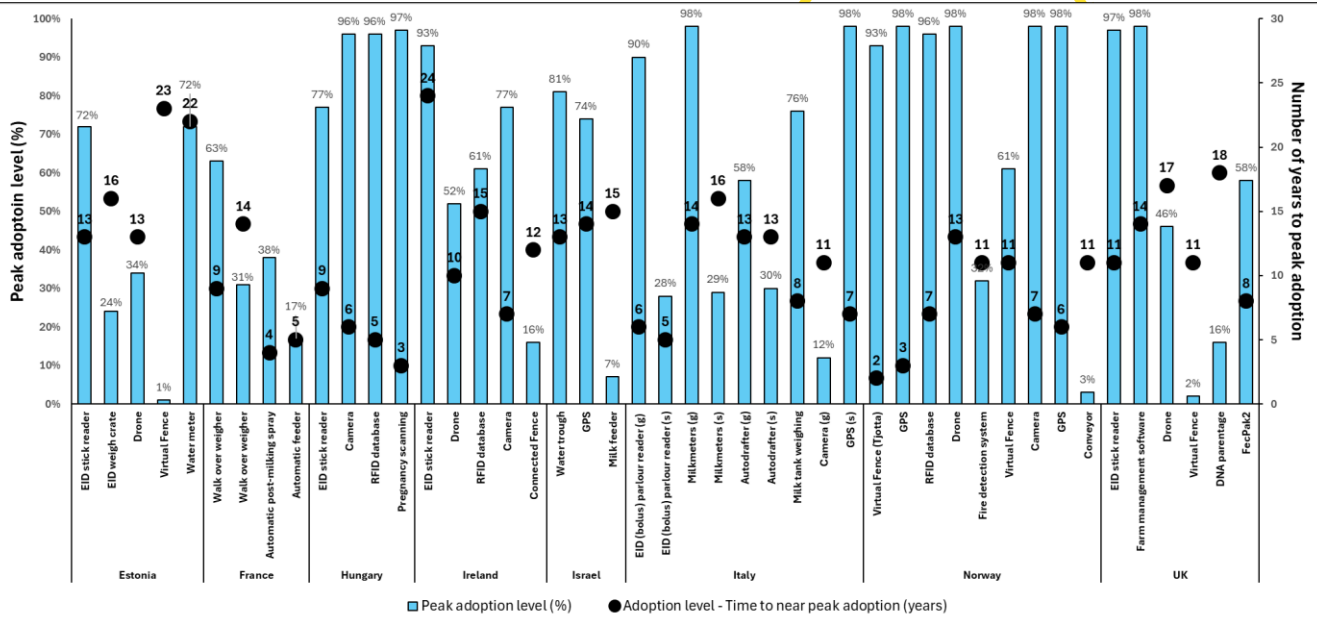
It would take 16 years for 24% adoption.



www.smartplatform.network



Approach



Evaluating the solutions

- Testimonies
- Farm demonstrations
- Training sessions
- ADOPT

- >20 farmers' testimonies
- 21 training/demo days
- 45 ADOPT sessions on 30 tools



Acknowledgments



- My colleagues at Kirkton
- Other colleagues at SRUC
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