Annex 2 - Target group Survey Summary Report Template – WP1

ITFARM

IT for Interconnection of Social, Economic and Environmental Aspects in Agribusiness

WP1 – Survey on Farms and Current Situation and Demand

(Please provide your findings from the Survey by 15th June 2022 by summarizing the feedback from the questionnaires in the following structure using the following formatting: Font Calibri, Font size: 12)

Precision agriculture in the Czech Republic is applied to 20% of agricultural land. A group of farms was randomly selected from this area, 11 of which agreed to fill in the questionnaire.

1) 5 farms with an average area less than 100 ha
2) 4 farms with an average area about 2.000 ha
3) 2 farms with an average area greater than 6.000 ha

The number of employees varies depending on the size of the acreage from 5 employees on type 1 farms, 60 employees on type 2 farms and 150 employees on type 3 farms; here, however, it is necessary to consider that some are working in associated businesses following the production of basic farm commodities.

The average age of employees ranges from 40 to 49 years.

All monitored farms have a long history, longer than 34 years of successful functioning.

All farms are profiled in plant and animal production, usually specializing in the production of several commodities, as shown in the following overviews:

- Animal and plant production, BTPM cattle breeding, horse and goat breeding, forage production
- Crop production of soybeans, wheat, oilseed rape to produce food and animal feed
- Livestock production of 250 dairy cows, milk production, crop production 2230 ha arable land, cultivation of cereals, oilseeds and legumes, 70 ha of orchards (apple, sour cherries, plums), 300 ha of meadows
- Crop production: cereals and fodder, rape, livestock and pigs
- Crop production - cultivation of cereals and oilseeds, animal production - milk and meat production
- Animal production, cattle breeding, crop production, milk and meat production
- Crop production of wheat, oilseed rape for the production of food and animal feed

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Summary:

11 farms

Area from 25 ha to 7000 ha

Number of employees 7 - 150

Average age 40-49 years

Crop production: cereals, oilseeds (rape), legumes, fodder

Livestock production: dairy cattle, milk, pigs, goats, sheep, horses

Others: fruits and vegetables

What technologies are currently in use in businesses? Positive impacts and possible obstacles or challenges in relation to their use. (Q3)

Seed drill depth control system

Electric seeder for small-size vegetable seeds based on power drive and optical fiber detection technology

Wheel mobile robots for the wheat precision seeding

Wheel mobile robots for the precision harvesting

Control system for seed-metering device using a single chip microcomputer

Smart irrigation system based on real-time soil moisture data

Smart fertilisation management

Grass yield monitoring

Field mapping with GIS

Yield monitor and data analysis

Smart fertilisation management

Variable-rate fertilizer control system based on ZigBee technology

Seed drill depth control system

Electric seeder for small-size vegetable seeds based on power drive and optical fiber detection technology

Field mapping with GIS

Yield monitor and data analysis Grass yield monitoring

Animal behaviour

Animal health and welfare

Feed management

Weight management

Summary:

Only the basic components of precise agriculture - directly linked to satellite land mapping - are used: sowing, fertilization, and partly harvesting. Water management is not used. Most components are used in animal production, except for weight management.

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Please let us know about the positive impacts and possible obstacles or challenges in relation to their use:

More precise use of medicines, saving feed, protection of animal health

Return on investment

Complications of use

The need for qualified staff

Greater demands on staff

Economist and legal aspects

Missing state support

Lack of skills important for the implementation and use of IT technologies

Lack of theoretical knowledge or processes related to IT technologies (computer programs, hardware, etc.)

Lack of practical knowledge or processes associated with IT technologies (computer programs, hardware, etc.)

Lack of confidence in the use of IT technologies

Summary:

The importance of saving fertilizers, lower consumption of feed, medicines is emphasized. Problems include complicated control of technical equipment, the need for qualified staff, the need for better practical knowledge of IT. Furthermore, insufficient financial and legislative support from the state.

Which are the main factors impacting the process of decision-making about introducing and applying new advanced ICT technologies in the businesses? (Q4)

Lack of financial resources to purchase new technologies

High capital investment

Return to investment

Short life of new technology

Complicated use of some technologies

High technical staff required

Legislation - government support

Lack of more detailed information

Legal problems, obstacles and challenges

Preferred types of additional training opportunities to support the process of introducing new ICT technologies in business. (Q5)

Training in the form of face-to-face meetings

Presentations by specific companies - workshops

E-courses with possibility of face-to-face consultations

E-learning with personal connections

Combination of both present and further education

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Practical skills lacking the most to apply advanced ICT technologi9es in businesses. (Q6)

Lack of basic ICT skills

Lack of confidence in using ICT technologies

Problems with processing of big data

Lack of practical knowledge of processes related to ICT technologies (applicable software, equipment etc.)

Lack of qualified persons

Conclusions:

Only simpler technologies of precision agriculture, based on satellite scanning, are used for sowing, less for harvesting. In animal production, technologies are more widespread, but automatic milking systems, for example, are not used.

The following technologies from the list of options *are not used* (for some only incomplete versions, and only occasionally):

Weather connected station

Soil management

- Soil electrical conductivity sensor
- Tensiometer
- Ground penetrating radar and gamma ray spectrometry
- Air-assisted high speed precision seed metering device

Water management

- Automatic irrigation system
- Smart irrigation system using global system for mobile communication (GMS)
- IoT-based renewable solar energy system
- Smart irrigation system based on real-time soil moisture data
- Improved organic fertilizer mixer based on the Internet of Things (IoT)
- Low-cost agricultural robot (prototype)
- IoT-based fertigation system

Opinions from practice:

“In terms of difficulties, everyone agrees on the lack of funds and the lack of state support for this type of business”.

“Technologies are faulty. Different device types are not compatible”.

“There is a serious shortage of skilled workers to work with data”.

“Although information is available, there is no possibility to compare my production with more successful companies - this will not replace any information”.

“Trainings are preferred in contact form. Personal contact is important”.

“Business training is also welcome, but with the proviso that I will only learn about the goods of one company here - and who has the time to train more companies, and how do I choose the best one for me?”

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Recommendations:

Attention needs to be paid

1) Providing basic information about the possibilities of precision agriculture, expanding information about technologies that are not yet used.

2) Try to use the company materials of service providers to compare and publish the services offered.

3) Select several model companies and process their position as Cases of the best practices, with the possibility to use them for mutual benchmarking of farmers.

4) Include benchmarking as part of the training course.

5) Include the necessary ICT skills in education, as a selective course.

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