RESULT 2: OPEN PLATFORM FOR SHARING KNOWLEDGE

WP 1: Learning Environment for SMEs

CASE STUDIES DEVELOPMENT

APPLICATION of precision farming

Part 1: General information for the enterprise

1. Legal name: Agricultural cooperative Mořina
2. Place: Mořina, Czech Republic
3. Subject of activity: Plant production, animal production, biogas plant
4. Legal status: Private enterprise
5. Management
    a. Gender: **Male / Female** / Other
    b. Age: up to 35 / **36-45** / 46-55 / 56-65 / over 65
    c. Education: primary / **secondary / higher**
6. Farm size

Crop production

The cooperative currently farms about 7,000 ha of land. Crop production is concentrated in four centres - Mořina, Hudlice, Tlustice and Sytno. The main crops are cereals, rape and poppy. In addition, the production of maize silage and grass haylage, which is mainly used for own consumption - feeding for own herd, consumption in own BPS.

Livestock production

Livestock production is focused on cattle breeding. Cattle farming is closed. At present, the herd has about 2 400 cows, of which about 900 are in large-capacity dairy cows in Kozolupy and Litny. Heifers are bred in the Drozdov and Třenice centres. Bulls are bred for fattening in the Pánov centre (near Libomyšl). Bulk feed is provided by own production. The cooperative also has its own feed mixing plant.

Electricity production - PV and BPS

In 2009, photovoltaic power plants were put into operation, which are located on the roofs of agricultural buildings.

In 2011, a biogas plant was put into operation in the village of Mořina and in 2013 a biogas plant in the village of Záluží u Hořovic. Corn silage, grass haylage and slurry are used to generate electricity. Waste heat is used to heat the buildings of the agricultural cooperative. In the village of Záluží, it is also used to dry corn and rape in a dryer located in the immediate vicinity of the BPS.

Auxiliary production

The cooperative operates a powder-coating plant, a locksmith's shop and a metal fabrication plant in the village of Mořina. There is also a repair shop on the premises. It repairs its own agricultural machinery and equipment. Apprentices of the secondary agricultural school in Radotín, in the field of repairing agricultural machinery, do their vocational training in the workshop.

Part 2: Smart technologies used on the farm

By covering the farm using GPS signals in the present day with RTK correction, accuracy of the order of centimetres can be achieved in fertiliser application, precision setting, application of livestock manure and

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digestate as biogas plant waste. Using precision navigation can save around 10 to 15% of tillage costs by reducing overlapping footage. The same is also advantageous when applying chemical protectants.

The above smart technologies are used in crop production in proper agronomic terms to have the expected effect and savings. Certain limits to the use of these technologies are created by climatic and natural conditions (the farm is partly farmed in the Bohemian Karst (limestone bedrock))

The data obtained from the use of these technologies are used, including meteorological data, for variable input dosage, advanced agronomic methods and advanced farm management systems.

Part 3: Owners' satisfaction with the use of smart technologies

1. Utility assessment

The agronomist of this farm is satisfied with the use of precision farming technologies because the expected effects of savings in input costs, such as savings in fertilizer and seeds, are coming to fruition.

2. Observed difficulties and problems

The problem with working with these advanced technologies is the compatibility of equipment from different vendors because, despite the standardised ISOBUS interface, machines and systems do not always communicate accurately.

Farmers have found their way and that is the gradual introduction of these technologies, first validation in operation and then deployment. There are basically no problems with maintenance and service, the only problem is the expensive cost of labour for service technicians (IT technicians) and expensive spare parts.

3. Potential risks

The concern about after-sales service is because new technology still brings communication problems, because different vendors use their software that natively have communication interfaces primarily (XML format), but deployment in practice is not without the intervention of a tenik and as already mentioned, these services are expensive.

Part 4: Financing the investment in smart technologies

The funds for the acquisition of these technologies are always linked to the need to acquire the necessary machinery for crop production. Here, the purchase is made from own resources or by means of a loan. State aid is always used if it is available for the technology in question. This combination of sources is necessary because the equipment involved is always expensive.

Part 5: Future intentions towards smart technologies

The company is certainly planning to invest in new technologies in plant production, mainly for two reasons. The first and most important is the efficiency of production from an economic point of view, but also a more gentle approach to the landscape. The second reason is communication with the government and its systems in the Czech Republic, it is a farmer's portal.

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Part 6: Some photos

Figure 1: Receiving antennas on the tractor roof for the corporate RTK signal.

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Figure 2 a, b : Smart adjustable machine blades for precise fertiliser application.

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Picture 3 a,b : Display for operator to identify data, front fertiliser application, machine position, equipment status etc.

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Picture 4 : ISOBUS connector to provide tractor and machine communication for precision fertiliser application.

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