



Sustainability in agriculture: a grain dryer which is both energy and time efficient

MTY SIPPOLA, ISOKYRÖ, FINLAND

- a farm cooperation, Juha & Jussi Sippola
- farm with gluten-free oats, oilseeds, caraway and peas
- a grain dryer which is both energy and time efficient

Both Juha and Jussi have a scientific background and have worked both in the field and in other sectors. “Because of the knowledge gathered in other sectors, we find it easier to see new opportunities in agriculture; innovations are usually new combinations of already existing things and knowledge,” says Juha.



1 - Juha Sippola, a farmer.

Autumn in Finland is rainy and wet and grain needs to be dried so that it can be stored and used throughout the winter. Drying grain ready for the winter can be time and energy-consuming process, particularly in a country such as Finland where autumn tends to be very wet. Conventional drying methods can also have a negative effect on the quality of grain. These methods are often unable to cope with the variations of the plant and environmental conditions, which can mean that the measurements are inaccurate. The measuring technology is not precise enough in all conditions and because of this, farmers sometimes dry grains longer than necessary, which increases energy consumption and can be detrimental to the quality of the grain. Brothers and farmers Juha and Jussi Sippola from Isokyrö (Western Finland) and Antti-Teollisuus (SME) decided to set up an Operational Group to deal with this issue and built a pilot grain dryer which uses an IT-based monitoring system. The dryer can produce high-quality dried rain with less effort from the farmer and uses less energy than conventional dryers.

Reliable measurements were taken at each stage lead to more precise control of the drying process. The dryer has **integrated moisture measuring equipment** which means that the impact of the particular plant properties and the environment on the measurement information can be minimized. **The system allows for measurements to be taken during the drying process** and adjustments to be made accordingly. The farmer can, therefore, avoid over-drying, **which can lead to lower quality of grain and under-drying**, which can mean that the drying process needs to be started again. The refined process enables the farmer to produce high quality dried grain than can be stored and used efficiently throughout the winter.

Reducing energy consumption

The precision of the dryer as described above means that it saves energy compared to conventional dryers. But what is more, **it is powered using woodchips produced on-farm** and so **reduces the cost for the farmer and contributes to a circular economy.**

Saving time for the farmer

The improved accuracy of the dryer also enables reliable automation of the system which saves time for farmers; **they do not constantly need to be checking moisture levels.** The dryer is also 'smart', it is connected to a remote monitoring system that sends information from the drying process to a cloud so that farmers can check the situation wherever they are.



Conclusion

The financial and temporal savings potential is clear. From measurements, it can be seen that up to 30-50% of energy control can be achieved. The result is simple math, saving time and energy by not having to dry the grain too dry. The savings are relatively high because the last percent drying requires the most time and energy. This means less drying time, less electricity and fuel consumption and more capacity for the job, Sippola says.



1 - Video about the new grain dryer. The texts and speech are in Finnish.

Links

<http://www.netikka.net/mtysippola/>

<https://www.maaseutu.fi/en/the-rural-network/good-finnish-ideas/innovation-groups/high-quality-cereal-with-less-energy/>

<http://www.netikka.net/mtysippola/tiedostoja/pohjankyro-lehti.jpg>

http://www.netikka.net/mtysippola/tiedostoja/koneviesti_1.jpg

https://ec.europa.eu/eip/agriculture/sites/agri-eip/files/field_core_attachments/nw_grain_dryer_08052018_en.pdf





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