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# A glimpse into the crystal ball of the storage and handling of grains and oilseeds

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**The recent mergers of several large global agrochemical and seed companies, their diversification and highly progressive technological approach bring new, innovative technology to agriculture. To keep up with this, the role of the handlers/storage facilities of grain and oilseeds will gradually be expanded.**

## 1. Temporary storage structures

Unpredictable weather due to climate change could drastically change the intervals of good and bad years. Climate change leads to a shift in grain and oilseed production. This erratic production and changing demographics will increasingly lead to a need for various temporary grain storage structures that can be deployed when and where required.

## 2. Technology

Farm information on production will enable the storage facility to optimise planning for storage. Remote-sensing technology makes production estimates easier and cheaper. Satellite data makes it possible to identify and classify grain crops, determine growth vigour, monitor plant condition and development of the various crops and also to make yield estimates.

## 3. Proactive risk determination

Other earth observation applications make it possible to determine groundwater and classify fields as conventional or conservation agriculture. Technology is also available to refine crop insurance by verifying damage and quantifying and comparing it to the scope and size of claims – hence the shift to objective damage estimation. In addition to satellite and index-based insurance, companies can also apply disaster management by identifying problem areas that will have a financial impact on the business, or determine crop prospects that are linked to repayments by individual producers.

Crop insurance cover can be applied more widely than just for weather, drought, floods, pests and price fluctuations. It is well known that conservation agriculture holds many benefits for production and, if crop insurance is linked to soil quality as well, soil data can be considered when rates are determined and can therefore be used as an incentive. Such monitoring can ensure compliance and reduce risks, while increasing soil health can improve the management of food security, sustainability and climate change.

The integration of data can lead to predictive instruments for pests and diseases. Although chemical control can keep pests and diseases under control, it requires high input costs, reduces the microbial viability and encourages the development of resistance. Analytical platforms will in the future help to predict and identify pests and diseases and

also determine their extent. Such instruments use sensor-driven field data, aerial photographs, weather and lifecycle analyses of diseases and pests to provide an early warning system for diseases and pests in any climate.

**4. Information systems**

Certain requirements force producers to provide variety names of genetically modified or self-pollinated grain and oilseeds when consignments are delivered. The intake systems of storage facilities should therefore be adaptable and make provision for changes so that such information can be provided. Technological levies on tons per variety are declared at the first point of trade and will be used to make the newest technology available locally so that producers can compete in international markets.

**5. Traceability**

Origin is becoming increasingly important and the storage facility's role is vital where an agrochemical passport must accompany a consignment from the farm to the storage facility and then to the processor. Overseas it is already common practice for every truck to be tested for mycotoxins, pesticides and heavy metals before the consignment is offloaded. Farms are subject to annual independent audits and inspections. Food safety requirements also apply to transporters – whether by road or by rail.

**6. Food security**

Mycotoxins have a negative effect on humans and animals. In order to control the incidence of these fungal by-products, local legislation was amended in 2017. Processors of grain will soon expect storage facilities to provide the assurance that the mycotoxin levels of grain delivered for processing are within permissible levels. As the specialised analysis of mycotoxins is a long, expensive laboratory process, storage facilities will have to rely on cheaper, quicker tests that are reasonably accurate.

**7. Automation**

Electronic samplers, as well as specialised grading apparatus that is based om image analysis and spectroscopy, can quickly, effectively and objectively determine quality on delivery and at the same time point out fungus infections that cannot be detected by the naked eye.

Protein sorters, for example, can optimally mix wheat at a specific protein level during outloading. The company can benefit financially from maintaining the protein level at a constant 12% (B1) and not needlessly outloading higher proteins.

Cleaning of silos: It can be difficult, time-consuming and dangerous to clean silos. Now there are automatic methods that exclude the human factor. Newly patented technology utilizes two large liners that alternately inflate and deflate to remove grain, without the need to enter the bin.

**8. Mobile sensors**

Effective, robust and reliable sensors offer a variety of logistical uses. They can be mixed into a grain mass to send signals that warn timeously against undesirable temperature or moisture conditions, as well as fumigants. Signals to prevent grain from spoiling can be sent from inside silos, bunkers, silo bags or shipping containers and warehouses.

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**ENQUIRIES**

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