

CPT10 + storage silo

1 THE CASE

A small farm in Rwanda manages a cultivated area of about 100ha producing approximately 800 tons of white corn a year. They are currently stored, in 50kg bags, under a roofed surface of about 20m x 25m requiring time, labour and space.

The farm needs to reach an integrated solution **consisting of a dryer + silo** to improve and optimise the two drying and storage processes

This way the corn **can be dried** shortly after being harvested, thus allowing the crops to **maintain their main organoleptic features**.

Storing the corn in silos saves on the labour required for bagging it, allowing for a **protected, safe and relatively small storage space** respect to the current solution.

The **bucket elevator saves on the labour** required to handle the corn and provides the foundations for possible future expansion.

Thanks to the reduction of drying times, the efficiency of the system and the mobility of the dryer, the customer can also offer the drying service to other local farmers, who, due to the small size of their establishments, cannot buy this type of machinery.

The customer, who up till today was on the market as a small farm, can sell his product, the drying and storage services and guarantee higher quality of the processed corn.



2 STORAGE AFTER DRYING

The **correct** and monitored **storage** after drying is the key solution to **keep the quality of the corn unchanged** over time. On the other hand, improperly managed storage (e.g. with high humidity or temperatures) can cause the crops to spoil, with the appearance and spreading of insects and mould causing crop damage and zero profit.

Correctly dried, cooled and clean corn, stored in a clean, dry and monitored silo, can be sold or used when needed with the consequent economical/financial benefit for the farmer.

Briefly, some advantages of silo storage assessed by the customer in question:

- **Storage in a vertical silo takes up less space than a horizontal ground silo**, making it possible to manage greater amounts of grain with the same available surface.
- **The steel structure is sturdy and the grain is protected** both from the elements and any animal attacks or burglary
- **The grain is handled automatically by elevators**, reducing the time and labour costs involved in moving large amounts respect to storage on the ground.

3 THE SOLUTION ADOPTED

Based on the current amounts of corn to be handled, the solution evaluated consists of a MECMAR CPT10 dryer and a storage silo connected to it by means of a bucket elevator capable of balancing the discharge of the dryer.



Figure 1: Dryer model CPT 10/94 T in operation

The decision to choose the **CPT10/94T** model mainly depends on the following factors:

- **Dimensions:** the 2.25m dryer can conveniently be shipped in containers and **installed and handled easily in small spaces**
- **Dust exhaust system with cyclone:** cleans the corn and gathers part of the dust produced during drying, preventing it from being released into the environment.
- **Dual drive traction** to be driven by electrical power or by a tractor as required. The first case **leaves the tractor free** for other uses, the second case allows it to be moved to the field and to perform drying in different environments or at **third-party customers**.
- **The standard hopper provides simplicity,** effectiveness and **flexibility in loading** carried out as follows: withdrawing from the pile, pouring from bags, discharging a load of moist product from the trailer or directly from the combine harvester.

Wanting the dryer to perform about 3 or 4 drying and cooling cycles a day, it can dry approximately 30 or 40 tons of corn a day.

The storage silo coupled to the dryer has a capacity of **250m³**, equivalent to about 200 tons of corn.

To optimise space, we recommend **positioning the dryer under a roof** and installing the silo outside of it. This way the dryer and its operator are sheltered against the elements and operation is guaranteed even in case of foul weather. The roof also allows the environment to remain ventilated during the drying phase.

4 FUTURE DEVELOPMENTS

The system installed at the customer's farm currently consists of three components: **dryer, elevator and silo**.

In view of development and company growth, in the future it can be further upgraded with elements such as:

- **a second storage silo** of the processed product or to store the harvested crop to be dried
- **a pre-cleaner** upstream of the dryer to clean the crop to be dried
- **a bagger** (possibly with a scale) to automate bagging of the dried product
- **a bin** with a capacity equal to that of the dryer **to simplify loading** of the dryer

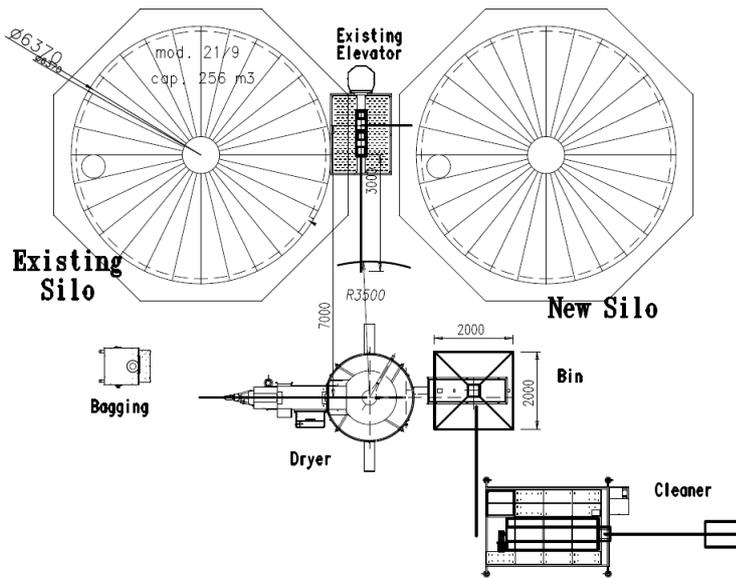


Figure 2: Draft of the development of the system with cleaner + bin + CPT10 + 2 silos + bagger.