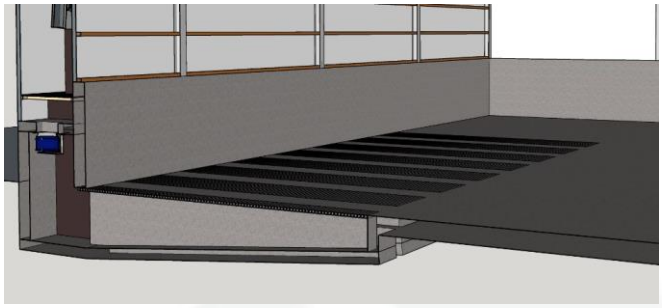
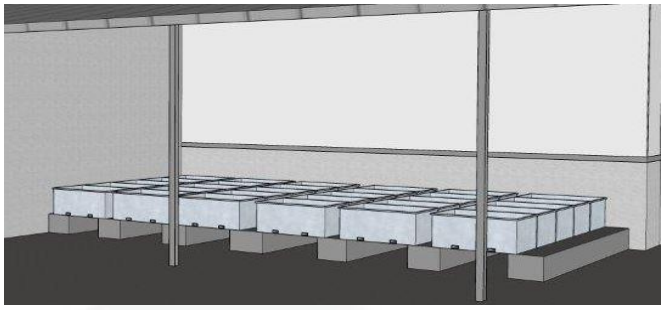
Optimize existing drying installations

At various seed companies the seed is dried in boxes placed in rows on air ducts. The ducts can be situated inside the floor or laying with so-called skids on top of the floor. In general the boxes are stacked 1 high and are always dried from below. One or more high pressure fans blowing air in a central corridor. Through this central corridor is the air is distributed over the ducts. Each duct is equipped with a slide to close. A central oil- or gas burner heats up all the air on to the same temperature.



Sectional view of underground air ducts.



Box drying in above-ground ducts with 'skids'

Known issues with this method:

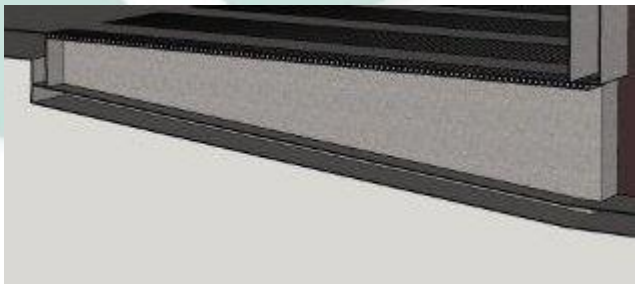
Uneven drying between the rows:
Because the air from the central corridor is often not well distributed, the drying between rows will not be equally. Boxes in certain rows receive more air than other rows and will dry faster. The more rows connected to the central corridor, the larger the differences in drying between the rows.

Condensation in the top layer of the box because of high initial temperature at little amount of air:
Wet and dry boxes be ventilated with the same (hot) air. In the event of wet boxes, the hot air will absorb a lot of moisture at the bottom, but because of cooling will be saturated at the upper layers. In case of too little air, the absorbed moisture will condensate and return on the seed. This seed will ultimately form an impenetrable layer that stops the drying process. In the event of a row with a shotage of air, this problem will occur more quickly.

Uneven drying between the boxes:
Boxes are not always filled evenly and also the type or size per box can be different. Air will flow more easier trough the boxes with less seed and/or boxes with a coarser content. These boxes will dry faster. Moreover, trough boxes with dry seed the air flows easier than through boxes with moisture seed; the drier seed will therefore even be drying more faster and the wet seed will dry even less. In the event of a row with a shortage of air, this problem will be strengthened.

Possible solutions:

1. Air outlets fitted with automatic slides
On the right is a simple way to adjust; each slide in a channel is equipped with an engine. When a channel is filled with boxes, the ABC processor will automatically open the slide.



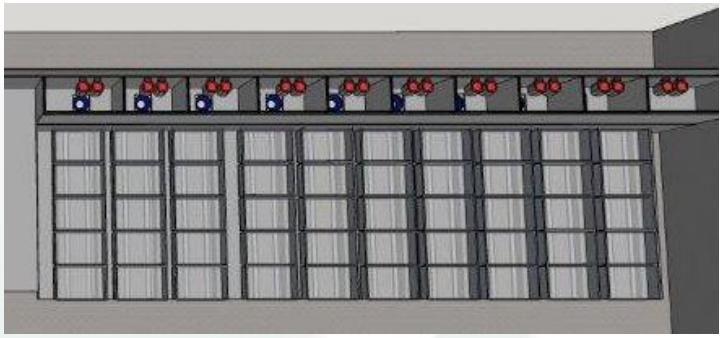
By measuring the air condition of the air from the seed, it can be determined if the seed in the row begins to dry. If that occurs, the moisture will be discharged with less and less air. The slide can therefore gradualy close. Because of this an unfavorable row will eventually get enough air to dry too.

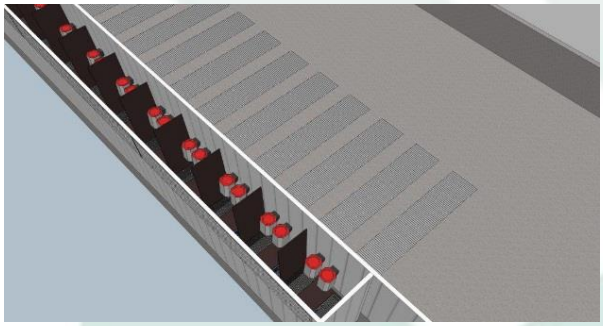
Optimize existing drying installations

2. Per row a fan and heating.

The problem of the condensation remains and the difference in drying between the boxes in an unfavorable row will not improve. The solution is to provide each row of a separate (radial) fan and a modular heating. These fans provide more air per kW and the air quantity is automatically adjusted to the drying phase of that row.

By placing a modular heating per row, the temperature is adjusted to the phase of drying; at the start a gradual warming and then optimized drying at the desired temperature. Because the quantity of air is also variable, two smaller gas burners are often placed to have greater difference between the minimum (1 burner low) and maximum capacity (2 burners high).





The drying can start directly when a row is filled with boxes. In this row the seed is gradually warmed with increasingly warmer air;

- No more condensation in the upper layer.
- More uniform drying at the top and the bottom of the box.

A large quantity of air ensures that all the boxes are dried more equally.

Each row of boxes is dried separately. Per row the air condition from the seed is being measured. When the seed starts drying, the air quantity and the temperature will decrease gradually. The drying stops when the seed in that row is dry. At that time the seed is also cooled down. The boxes are removed and the next serie of seed boxes can be dried. In this way the drying process can go on continuously. Now several products can be dried at different temperatures to various equilibrium moisture content at the same time.

Agratechniek gives advice on how the building and construction can be adapted. And also supplies and installs the required equipment. The adjustments in the building can be carried out by a local contractor.

The investment in modern technology ensures that your existing installation will function better. This creates a much higher capacity and more flexibility. There is also a lot of energy saving; a large fan requires more power than several smaller together with the same total air flow. The modular capacity of the fans and heating also provides a large energy saving.

The investment therefore pays off, thanks to faster drying with more capacity and a higher product quality thanks to better drying. So better results by more yield in less time and lower costs.

<u>This is one of the possibilities. Your installation can also be improved by us!</u>