

## Grain Drying

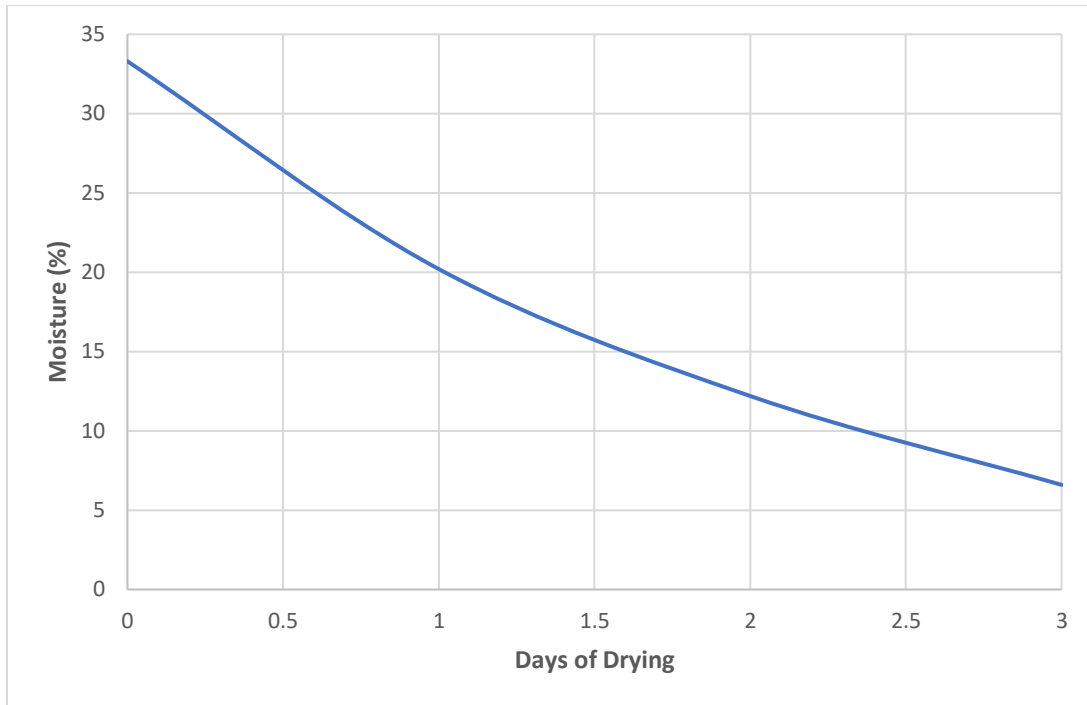
Grain and other agricultural products are typically dried. A common method of drying things is to leave them out in the sun with air circulating around them. If the drying task is not too large, that is, not more than about 1 kg of water per square meter per day, the Solar Household Energy Bank can help with the drying by raising the temperature of the things to be dried while still giving adequate air circulation to remove moisture. Typically, this helps more when there are larger objects to be dried, when a significant barrier to drying is the diffusion of moisture within the thing to be dried. This is the case with firewood, seen on a separate page.

The photo below shows the grain drying setup, which one this particular day was performed at the same time that 3 buckets of water were heated and a pot of cooking water was pre-heated. There is 3 kg of corn, spread out in a layer about 1 cm thick. The corn is on a separate plastic sheet, such that it can be gathered up easily. There is a temperature logger under the corn, showing that it achieved 60°C briefly, and was over 55°C for a long time. This is enough to kill any insect eggs and larvae.



**This photo shows the corn drying setup. There is about 3 kg of corn spread out in a layer 1 cm thick. There is a temperature logger under the corn.**

The results of 3 days of corn drying are shown in the graph below. Three days was enough to take the corn from very wet to very dry.



**This shows the moisture content of the corn at the start (day 0) and after 3 consecutive days of drying.**

To dry a larger amount of grain one could use more area in the Solar Household Energy Bank. At some point, this would interfere with any other tasks one wanted to perform, but you could use the Solar Household Energy Bank exclusively as a grain drier. There would be a limit to how thick the stack of grain should be, probably not much more than 1 or 2 cm. One could use a thicker layer and stir or mix the grain between days of drying, but there would then be a chance that some grain would be low in the stack on every day and not dry properly.

If the top plastic layer gets a lot of condensation, then you should use fewer rocks along the sides of the device, allowing a little more air to circulate through the system and carry away the moisture. A little condensation is OK, but if the condensation gets so thick as to drip on the things you are trying to dry, then the system should be made more open. The air circulating through the system will also depend somewhat on how windy is the weather.

Insect eggs and larvae in the grain should also be killed by the high temperatures, as long as the stack is not too thick. The grain should be in the sunny part of the Solar Household Energy Bank, not shaded by the water buckets.