# Solar drying of olive mill wastewater with manure for the production of organic fertilizers

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It is a fact that high inputs of chemical nitrogen (N), phosphorus (P) and potassium (K) have been used globally to increase crop yields. However, crop yields have not increased at the same rate as the increase in fertilizer applied (Vitousek et al., 2009). Up to recently, the main environmental issue with chemical fertilisation was the local effect of the (excess) use. In the last 10 to 15 years another parameter for observation has been added, that of carbon footprint and global climate change.

Baldi et al. (2010) reported that chemical fertilizers could be replaced by compost. However, application of manure without a corresponding decrease in chemical N, P and K inputs increases the risk of overuse of fertilizer and water pollution. Olive mill wastewater (OMW) has been suggested as a soil fertilizer (Saadi et al., 2007), focused on its direct application to agricultural soils as an organic fertiliser. Nevertheless, recent results revealed that this solution has some drawbacks such as infiltration of phenolic compounds and inhibition of microflora (Shabou et al., 2005).

Aim of this work is to determine if the condensation of manure, after composting and solar drying process with the addition of olive mill wastewater, for utilization of nutritive elements with low cost technologies can result or produce an alternative low cost organic fertiliser, rich in nutrients. Olive mill wastewaters were added in three different types of manure (pig, cow and chicken manure) in a greenhouse. The experiment was conducted for a period of about 6 months. The quantity of OMW added in the drying material manure depended by moisture content. The composition of final products at the end of solar drying process was presented in Table 1.

Table 1. Composition of final products at the end of experiment

| **Parameters** | **Final Product** | | |
|---|---|---|---|
| **(%)** | Poultry | Pig | Cow |
| Nitrogen | 2.8 | 2.6 | 3.0 |
| Potassium | 12.3 | 12.4 | 3.8 |
| Phosphorus | 0.9 | 0.5 | 0.5 |

Results showed that solar drying process of OMW with poultry manure produce an organic fertilizer containing about 3-1-12 % of N-P-K.

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