

# Comparing the environmental impact of home grown tomatoes with supermarket products



## Goal and Scope

This study investigates the environmental impact of three different scenarios for the supply of tomatoes to households: (a) home grown tomatoes from own plantation in a pot, (b) field grown tomatoes from supermarket and (c) tomatoes from supermarket, grown in a greenhouse. Data include the entire life cycle from field to household. Food losses are taken into account.

## Life Cycle Inventory

The life cycle inventory for home grown tomatoes includes: clay pot (20 l, 10 year lifetime), garden mould (20 l/a and pot), purchase of seedlings, fertilizer usage according to packaging instructions, pesticide usage corresponding to the average use in private gardens, tap water (40 l/season and plant), yield (3 kg/pot and season). An average Swiss transport scenario for consumer purchases is used for transports to home. The inventory analysis is based on data in the ecoinvent database v2.2 [1] and in the ESU-database [2].

## Life Cycle Impact Assessment

The environmental impact is assessed with the Ecological Scarcity Method 2013 [3] and summarized to ecological scarcity points. Fig. 1 shows the environmental impact per cultivation method and kg of tomatoes. The overall environmental impact of the different cultivation methods is subdivided by the source of the impact. Field grown tomatoes from the supermarket show a lower impact than home grown tomatoes. The usage of garden mould and its transport to home cause the most relevant environmental impact of home grown tomatoes. The environmental impact of tomatoes grown in a greenhouse is mainly caused by heating.

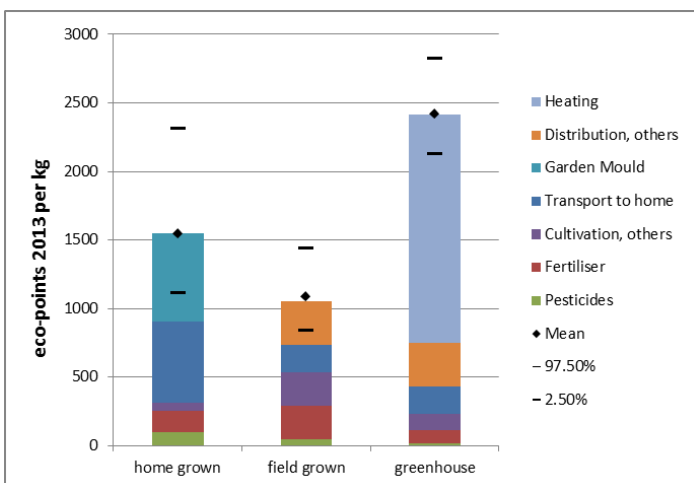


Fig. 1: Environmental impact of different tomato cultivation methods per kg of tomatoes at home (eco-points 2013 per kg) with confidence interval of 5 percent.

The impact categories “global warming”, “main air pollutants and particulate matter” and “water pollutants” show the highest variability regarding their influence on the overall impact (see Fig. 2). The share of the other impact categories does not relevantly vary between the different cultivation methods. The share of main air pollutants and particulate matter is highest for home grown tomatoes. This is caused by the high amount of garden mould per kg of yield in comparison to the other cultivation methods. The relatively high amount of garden mould has also an effect on the environmental impact caused by home transport. The share of water pollutants in the total environmental impact is highest for field grown tomatoes. This is because the highest amount of nitrogen fertiliser is calculated for that cultivation method. The relatively high environmental impact of tomatoes grown in a greenhouse compared to other cultivation methods is due to heating. Other environmentally related impacts tend to be lower than in the open-ground cultivation.

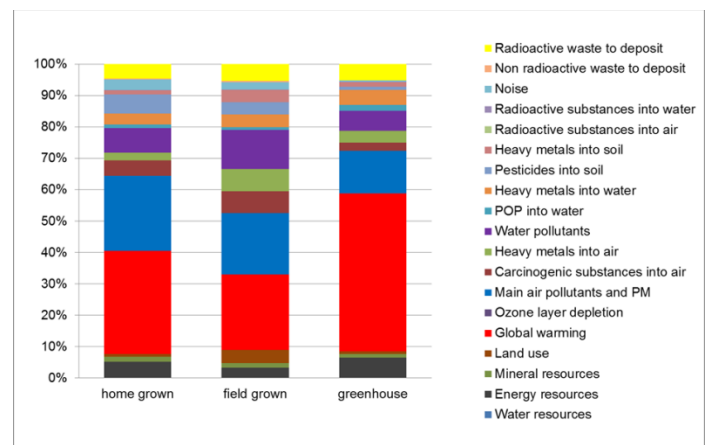


Fig. 2: Percentage of impact category in overall environmental impact per cultivation method (Ecological Scarcity Method 2013).

## Interpretation

According to the assumptions in this study home grown tomatoes do not cause lower environmental impacts than seasonal tomatoes from the supermarket. It has to be considered that the performance of this cultivation method is very much depending on the individual cultivation behaviour. The yearly usage of garden mould can be reduced by the reuse of material. This is also related to a reduction of transport weight. In addition, transport by bicycle or by other means of transport (train, bus) could reduce the impact. Fertilizer and pesticides usage can also be reduced. However, this measure may lead to lower yield results. Considering the impact reduction potential it seems possible to cultivate home grown tomatoes which cause a lower environmental impact than the other cultivation methods. But, on the other side it can be feared that many home gardeners do not perform as well as professional tomato growers.

## References

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