

## CO<sub>2</sub> Balance of Hardy Nursery Stock

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### Summary

Discussions about the carbon footprints of the products we consume are popular, so the nurseries are interested in the effects of their plants on climate. It is fundamental to understand that the carbon footprint, the assessment of impacts on the climate, is measured by a life cycle assessment. And such a life cycle assessment is being done following certain rules like ISO 14040.

There are two different types of a life cycle assessment: the longest is the timespan "cradle to grave" which means that all impacts are counted from the start of the production until the end of the life of a product, including its disposal. Measuring the impacts at the consumer's level is often very difficult, so many life cycle assessments are limited to "cradle to gate", from

the beginning of the production to the time when it leaves the producer, the "gate of the factory". This difference between "cradle to gate" and "cradle to grave" is often neglected in communication but has an essential influence on the outcome of a carbon footprint. The carbon footprint is measured in CO<sub>2</sub>, or, if other greenhouse gases like methane and laughing gas are included, in CO<sub>2</sub> equivalents (CO<sub>2</sub>-eq).

There are only few data available about the carbon footprints or CO<sub>2</sub> emissions of the production of hardy nursery stock. In publications from Italy and the USA, the carbon footprints of several examples have been calculated. Following these figures, in several cases the greenhouse gas emissions of container crops

were higher than those of plants cultivated in the open ground. In some of publications, the emissions were compared to the CO<sub>2</sub> binding or sequestration (binding and storage) of the plants in their tissue during nursery cultivation ("cradle to gate"). In some, it was higher and in others lower.

An interesting point is the question how to value this CO<sub>2</sub> binding in the plant tissue, especially regarding the far higher amount of CO<sub>2</sub> being bound during the later life of the plants in the garden. Many people and organisations like the German Nursery Association BdB state that this binding is a CO<sub>2</sub> sink and even demand final compensation. But if a life cycle assessment is calcu-

lated "cradle to grave", it must be considered that in the state of "disposal", the woody plants are being decomposed or burned and all the carbon in the plant tissue will be emitted as CO<sub>2</sub>. So, plants can only bind CO<sub>2</sub> for a limited time, depending on the plant perhaps 10 or 100 years, which is short compared to the sequestration of peat (up to 10,000 years), mineral gas and oil or coal (up to 500 million years). Nevertheless, woody plants are doubtless beneficial for the environment, even if they are not a CO<sub>2</sub> sink. They reduce heat and noise in urban environment, bind fine dust and other air pollutants, deliver food for insects and other organisms and are an important cultural asset.