STACKED

The building design, systems engineering and performance analysis of plant factories for urban food production

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Propositions

accompanying the doctoral thesis
"STACKED - The building design, systems engineering and performance analysis of plant factories for urban food production"

by Luuk J.A. Graamans

1. Fixing the stomatal and aerodynamic resistance of the canopy in the Penman-Monteith model allows for an accurate prediction of the crop energy balance in the plant factory. [This proposition pertains to this dissertation.]

2. Compared to more traditional food production systems, plant factories are able to achieve higher resource use efficiencies, except for electricity. [This proposition pertains to this dissertation.]

3. The best façade design for an energy-efficient plant factory is that of a greenhouse. [This proposition pertains to this dissertation.]

4. Plant factories can serve as energy flywheels in urban energy systems with intermittent renewable energy sources. [This proposition pertains to this dissertation.]

5. Plant factories will not be able to solve the increasing nutritional needs of the projected population growth without a substantial shift in the global diet and income.

6. Plant factories can improve the food resilience of cities and the health of its citizens.

7. Increasing the photosynthetic efficiency of plants will be more effective for improving agricultural production than optimising crop production systems.

8. Controlled environment farming will prove to be one of the key technologies for the prolonged survival of the human race on Earth or elsewhere.

9. The focus of scientists on either a small scale or a large scale hinders them in solving complex problems.

10. People will never be able to run a marathon in half of the original time, regardless of whether they are wearing Nikes or not.

These propositions are regarded as opposable and defendable, and have been approved as such by the promotors Prof.dr.ir. A.A.J.F. van den Dobbelsteen, Dr.ir. M.J. Tenpierik and Dr. C. Stanghellini.