

Can lysimeters be used to reduce emission in soil based glasshouse horticulture?

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Introduction

The ecological surface water quality in areas with intensive glasshouse horticulture in the Netherlands is not fulfilling the goals of the EU Nitrates Directive and Water Framework Directive. Opposite to soilless grown crops with obligatory recycling of drainage water, emission in soil based growing systems is difficult to manage. For some crops the conversion from soil based to soilless systems is economically (e.g., chrysanthemums) or principally (organic horticulture) not an option. In the Netherlands a steady ~20% of the total glasshouse horticulture is therefore soil based. Since greenhouse production occurs year-round and at a high level, the amounts of water and nutrients used are much higher than in field crops. Thus emission of excess water and nutrients to the ground water and open surface water is likely to occur. The Dutch policy is aiming to tackle the problem of emission at its source. Therefore, we need methods to apply water and nutrients at rates equal to the crop demand. We are conducting a project to develop a decision support system for the growers for achieving this goal and thus to minimize the leaching to the ground water and discharge to open surface water.

Materials and Methods

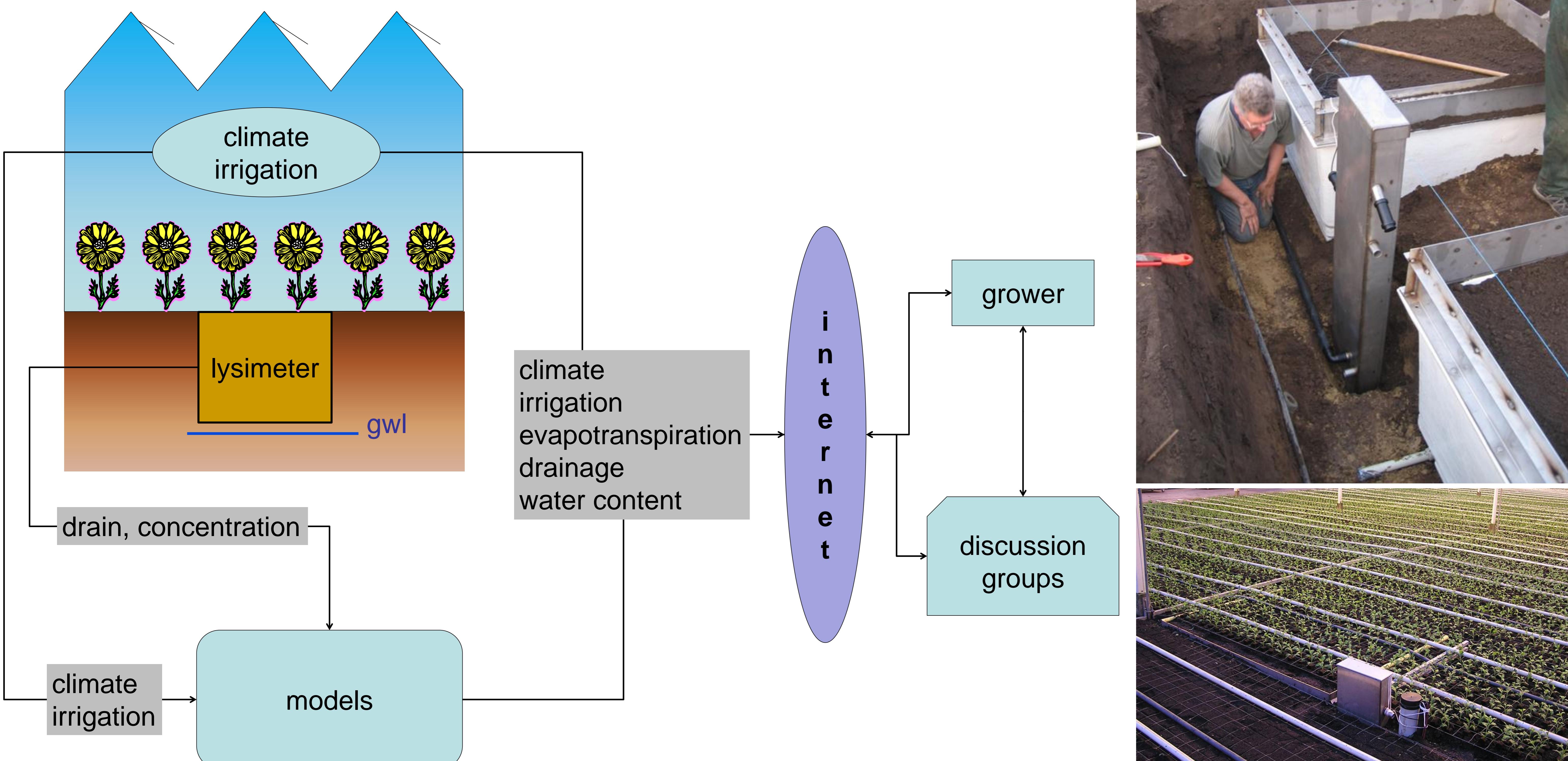


Figure 1. Scheme of information exchange in the project chain.
Growers can use the information to adapt their irrigation scheduling.



Figure 2. (top) Installation of the lysimeters, and (bottom) top view after installation.

Preliminary results

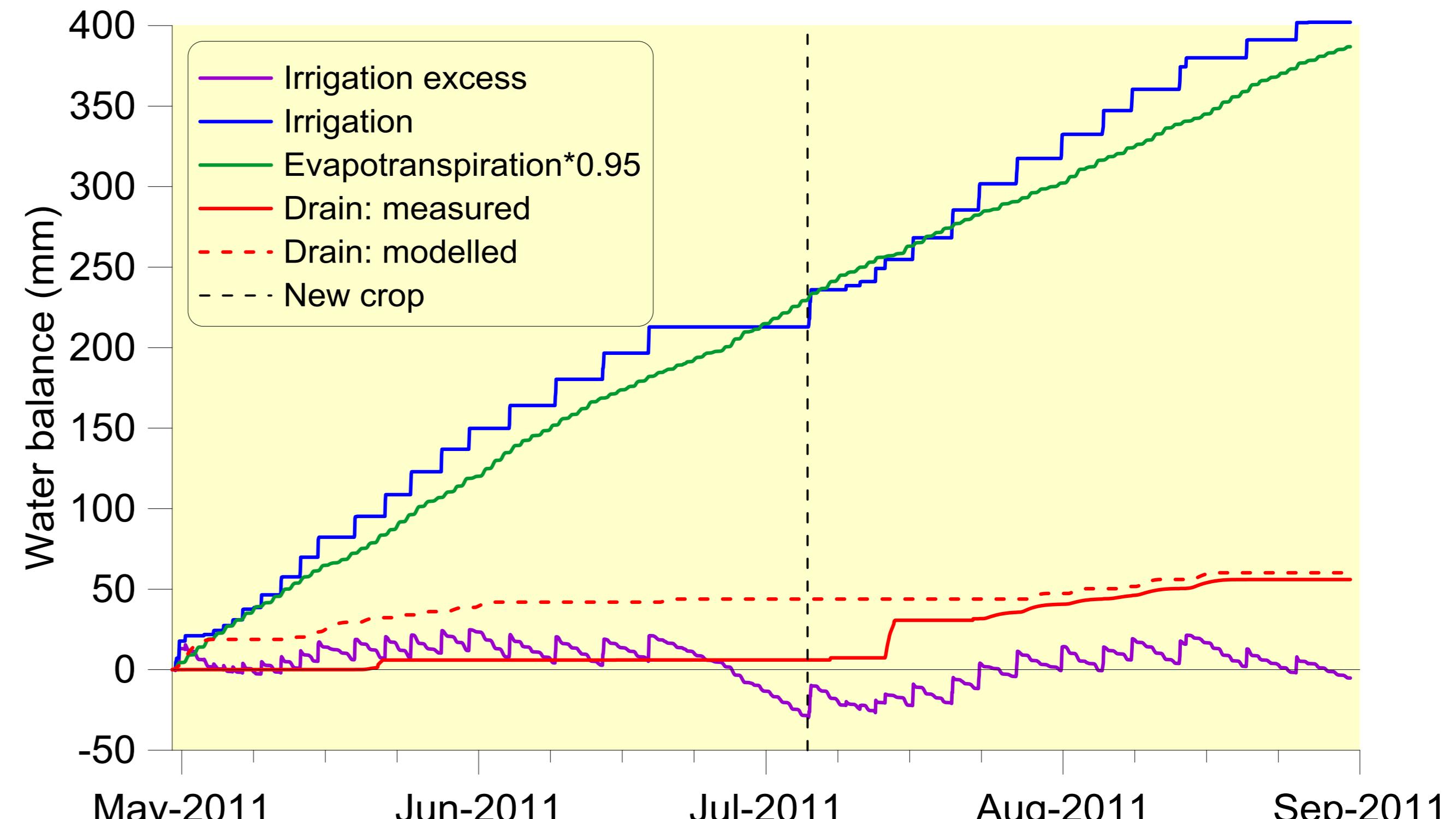
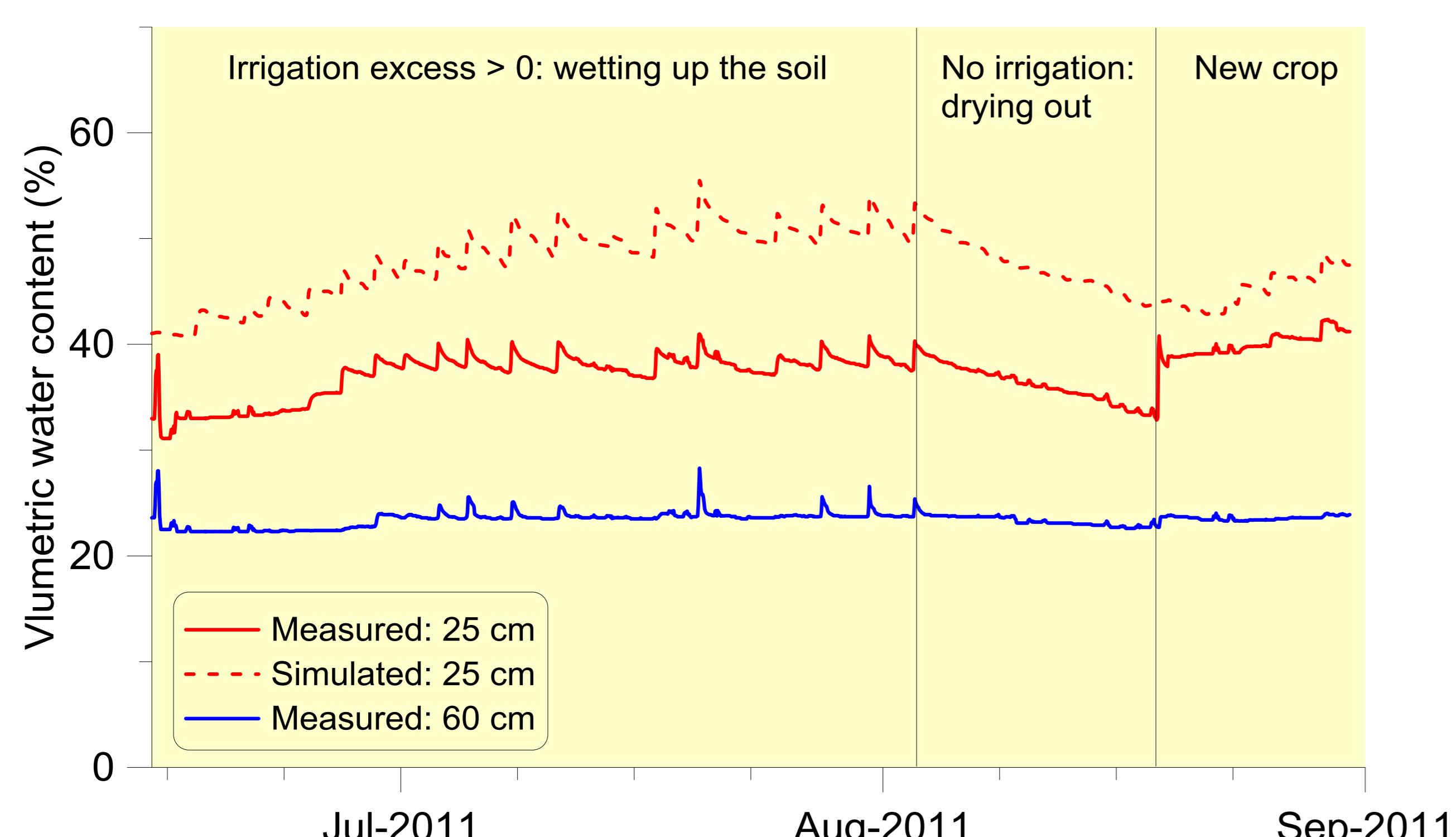


Figure 3. (left) Time course of volumetric water content for grower A, and (right) mass balance terms inside lysimeter for grower B.