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In one part of photosynthesis, known as the Calvin cycle, carbohydrates are produced using carbon dioxide from the atmosphere. This process can be modelled using systems of ordinary differential equations for the concentrations of the substances involved. The main subject of this talk is some work done together with Dorothea Möhring on the qualitative behaviour of solutions of some of these systems. In particular the phenomenon known as overload breakdown will be discussed. Mathematically this means that the concentrations of some of the substances in the system tend to zero at late times. The biological background is the following. If carbohydrates are exported too fast from the chloroplast the production in the cycle cannot keep up. It is overloaded and breaks down. The main methods used in this work are the derivation of restrictions on ω -limit points with zero concentrations of positive solutions and the use of Lyapunov functions. In this way information can be obtained on the circumstances under which overload breakdown takes place in a given model and which concentrations tend to zero at late times when it does so. This provides criteria for deciding on the appropriateness of different models. (Received August 05, 2015)