

On the drawing up of planning documents for agricultural production process

Dr. H. Auernhammer, Landtechnik Weihenstephan

Accurate data on working time, energy requirements and capital requirement for machines and buildings are needed for the planning and objective comparison of agricultural production processes. These should then be linked in practical models to permit calculation of the costs per unit and thus comparison and classification.

Determination of data

In the field of cattle management the work time requirements have been determined in the form of work observations for 10 years. More than 120 000 individual time measurements now form the basis for about 350 schedule times in the fields of bullock fattening, dairy cattle, calf and heifer management. All these schedule times are available in fully documented form on computer data storage media and are being used regularly by 10 institutions. Due to the accurate definition of the parameters included and the data filing system even joint evaluations of times measured in different places were possible.

In the same way about 60 000 individual time measurements have been carried out on agricultural building sites over the past 7 years. These data have also been evaluated and documented and stored in the above-mentioned form.

Since 1978 greater efforts have been made to determine electricity consumption. Comprehensive practical measurements on storage equipment for pre-wilted silage, hay and silage maize revealed a wide basis for the still universal planning data on a functional basis.

Model formation

Taking the work time data for cattle management as a basis, a start was made in 1975 on compilation of a universal calculation system for bullock fattening in the form of a pilot study. The following requirements had to be met:

- simulation on the basis of deterministic models
- complete documentation of all models
- model structuring in accordance with the practice in the hierarchical sections
 - schedule time
 - process
 - total work
- consideration of all relevant parameters with practical pre-adjustments
- separation of calculation program and model data
- computer assistance with machine-independent programming
- production of result reports with different information contents from complete recording of results to output of only the final result.

Introduction of remote data processing via visual display units resulted in the following additional requirements:

- interactive operation
- retrieval in the dialogue

Until 1980 all these requirements were met by the 3 computer programs UPDATE, KALDOK and DOKSYS. They now permit compilation of a complete circulation system as shown in Fig. 1.