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Farm management tasks in Agriculture

In agriculture farm management becomes more and more important. The main aim of this project which is to be described below was to make working time requirements available for farm management in agriculture. Per hectare and year large farms need much less working time for farm management than little ones. These time requirements range from 3.4 (100 ha) to 0.8 (1 000 ha) working hours per hectare and year. Absolutely farm management in agriculture requires between 342 (100 ha) und 770 (1 000 ha) working hours per farm and year. This difference is reason for to deal with this subject and to establish optimising strategies.

Keywords
Working time requirement, modelling, farm management, agriculture

Abstract
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Increasing mechanisation has resulted in less working time on the field but a greater proportion of the total working time requirement being allocated to farm management. In the main it is administrative work which leads to the assumption of an absolute rise in the working time requirement for farm management.

The high value placed on farm management tasks makes it vital to have reliable key work study figures for farm planning. This means that the quality and quantity of work study data on farm management must be comparable with those on production-related tasks (ploughing or fertiliser application, for example). This is the only way to ensure complete labour organisation on the farm [1].

Material and methods

The aim of the project was to make key work study figures available for farm management in arable farming. Suitable systematic classification and a targeted methodological procedure formed the essential points [2]. The compilation of farm management tasks was strictly separate from the collection of task elements and task sub-processes (for example switch computer on, switch computer off) and the determination of influencing variables (for example number of invoices, number of fertiliser purchases). An existing data base provided the basis for the task elements and task sub-processes required during calculation. Missing arable farming task elements were added to the data base. The influencing variables were ascertained empirically by personal interviews on commercial farms [3]. It was thus possible to calculate the working time requirement for arable farm management for different farm sizes using calculation models.

Results

The working time requirement calculation was made in a calculation model for farms of different land area. By doing this a specific working time requirement could be given for the management of each individual farm. In addition to the total working time requirement for farm management, the corresponding values could also be calculated at the level of a specific category (for example planning, organisation, control and purchasing) or at sub-category level (for example soil samples, fertiliser planning and leasing matters). As is already known from production-related activities (e.g. ploughing), tasks in agriculture are subject to considerable economies of scale, i.e. the time requirement per hectare decreases as plot size increases. In outside work many farm management tasks do not relate to one plot of land, so farm land area represents the key variable for these economies.

Two groups of tasks in arable farming also have different time requirement patterns in terms of land area. Whenever a specific task is carried out for one crop or for the arable area as a whole, a considerable reduction in working time requirement per hectare per year can be expected. This is the case, for example, in fertiliser application planning and most purchasing tasks.

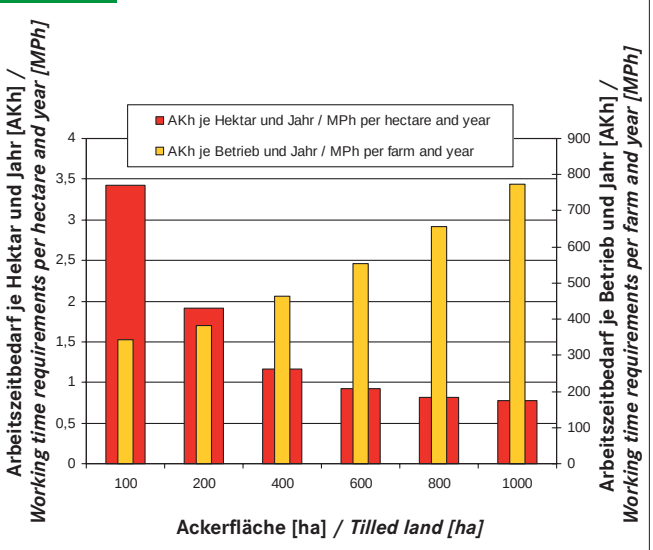
A second group of tasks shows far smaller economies of scale. One example is the taking of soil samples. Although a reduction in the time requirement is recorded even here, the effect is far from that achieved in the former group of activities. On the one hand this pattern is due to the fact that that soil samples have to be taken separately for each plot. On the other hand, the time requirement per plot increases as plot size increases.

Total working time requirement for farm management

The total working time requirement for farm management in arable farming is summarised in **table 1** as the total of all farm management tasks. Subject to land area, arable farms spend around 340 (100 ha) to 770 (1 000 ha) man hours (MH) per farm per year on farm management. If the time requirement for farm management is calculated relative to one hectare, distinct economies of scale effects are noted. The working time requirement for farm management per hectare per year falls sharply for larger farms (**figure 1**). These figures fluctuate between 3.4 and 0.8 MH per hectare per year according to farm size. As regards land, therefore, the time requirement shows a clear dependence on farm size.

Significantly differing values are obtained for the working time requirement for individual categories (**table 1**). Especially striking is the high time slice spent on planning and organisation as well as further training, although the time requirement for information and further training decreases dramatically as land area increases. The table also shows the areas of farm management in which the greatest optimisation potential can be expected. This is made even clearer when relative time slices are illustrated. Whereas the time requirement for information and further training is also falling in percentage terms, it is

Fig. 1



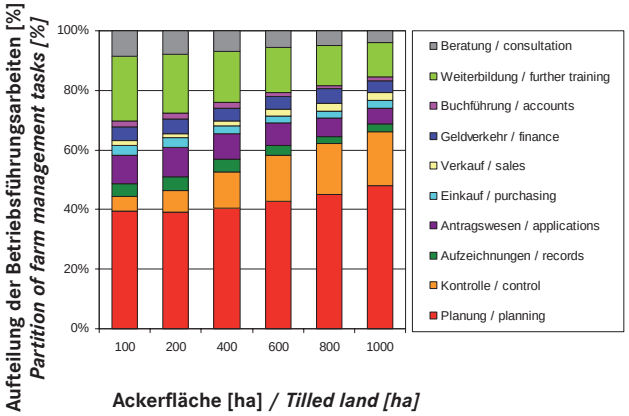
Working time requirements for farm management in agri-culture in subject to the tilled land

Table 1

Working time requirements for farm management in agriculture

	Ackerfläche [ha] *Tilled land [ha]*					
	100	**200**	**400**	**600**	**800**	**1 000**
	AKh je Hektar und Jahr *MPh per hectare and year*					
Planung *Planning*	1.35	0.75	0.47	0.39	0.37	0.37
Kontrolle *Control*	0.16	0.14	0.14	0.14	0.14	0.14
Aufzeichnungen *Records*	0.15	0.09	0.05	0.03	0.02	0.02
Antragswesen *Applications*	0.33	0.19	0.10	0.07	0.05	0.04
Einkauf *Purchasing*	0.11	0.06	0.03	0.02	0.02	0.02
Verkauf *Sales*	0.05	0.03	0.02	0.02	0.02	0.02
Geldverkehr *Finance*	0.16	0.09	0.05	0.04	0.04	0.03
Buchführung *Accounts*	0.07	0.04	0.02	0.01	0.01	0.01
Weiterbildung *Further training*	0.74	0.38	0.20	0.14	0.11	0.09
Beratung *Consultation*	0.29	0.15	0.08	0.05	0.04	0.03
Betriebsführung ***Farm management***	**3.42**	**1.91**	**1.16**	**0.92**	**0.82**	**0.77**

Fig. 2



Relative distribution of working time requirements for farm management in agriculture in subject to the tilled land

still increasing for planning and organisational tasks on larger farms (**figure 2**).

Relationship to total working time requirement

It is more difficult to predicate the share of farm management in the total working time requirement than it is in inside work. By contrast with inside work, for outside work farmers are making increasing use of the services provided by contractors and machinery syndicates. The greater the proportion of outsourced jobs, the greater the share of farm management tasks in the total working time requirement.

In the case of many services employed as well as in highly mechanised farms this would be indicative of farm management taking up a large share of the total working time requirement. On the other hand, it must be borne in mind that particularly arable farm management tasks relative to one hectare fall sharply as land area increases. By contrast with indoor farming, where many tasks relate to individual animals, arable farming has significantly fewer management activities which have to be carried out in relation to one hectare. The obvious assumption is, therefore, that the relative share of farm management is subject to great fluctuation due to the differing extent of field work performed in-house.

Conclusions

The time requirement for management jobs in arable farming can vary considerably from farm to farm. It is obvious, however, that the time requirement for farm management per hectare per year decreases as land area increases. Large farms expend considerably less time on farm management relative to one hectare of arable land. In this area also, therefore, there is optimisation potential resulting from farm growth. In addition to basic time-saving from the exploitation of economies of scale, all categories of farm management should be scrutinised separately, as savings effects can certainly be made in all areas. Particularly those areas of activity taking up a large time slice (planning and organisation, control, information and further training) should be looked at more closely. The inclinations of farm managers and manageresses are decisive in influencing time requirements, especially with regard to information and further training, but consultancy as well. Here it is not always easy to make a distinction between essential and less important information.

The systematic and model-oriented structuring of farm management tasks opens up for the first time the possibility of differentiated data collection and calculation, i.e. of planning the working time requirement with the aid of mathematical models. Influencing factors acting on working time can be integrated into the models on an individual farm basis and the working time requirement calculated accordingly.

In future at least a relative increase in the working time requirement for farm management can be assumed, firstly because the mechanisation of field work is ongoing and secondly because increasing use is being made of service providers. The absolute development of the time requirement depends mainly on whether and to what extent additional administrative tasks and record-keeping duties devolve on agriculture, or whether simplifications can be made in this area.

Literature

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