

Matthias Rothmund, Hermann Auernhammer and Markus Demmel, Freising

Total community involvement in Zeilitzheim's mono-management programme

Virtual farm consolidation in the form of managing as one unit (mono-management) a particular stretch of land actually owned by many farmers offers owners of small-structured farms the possibility of exploiting the advantages of increasing field sizes without having to carry-out often difficult land ownership exchanges as part of a farm consolidation process. The reductions thus offered in time, inputs, field margins and overlapping reduces stress on the environment, soil and farmers' wallet in equal measure. Through utilisation of farm data all yields and inputs of the multi-ownership area can be attributed correctly to the individual farmer based on the extent of his land holding therein.

Dipl.-Ing. agr. Matthias Rothmund is studying for his doctorate in the specialist department Technology in Crop Production in the Special Sector for Biological Raw Materials and Technology in Land Utilisation of the TU Munich. Prof. Dr. Hermann Auernhammer is director and Dr. Markus Demmel assistant in the same special sector, Am Staudengarten 2, D-85354 Freising; e-mail: rothmund@tec.agrar.tu-muenchen.de.

Within the framework of the cooperative project preagro, the presented part-project was supported by the BMBF. We thank the participating farmers in Zeilitzheim and the Gerolzhofen machinery ring for its readiness to cooperate.

A refereed paper for LANDTECHNIK, the full-length version of which can be accessed under LANDTECHNIK-NET.com

Keywords

Transborder farming, virtual land consolidation, property based accounting, data acquisition

Structural change in agriculture increases at a greater speed than can, and should, be followed through readjustment of farm enterprise area. This has led to the situation where many farms, particularly in South Germany, comprise a great number of small separate strips of land associated with unrepresentatively high expenditures in downtime, travelling time as well as time for turning operations during field work results from such systems compared with well structured agricultural areas, include higher costs for carrying out farming operations, higher inputs and naturally also the associated increased stress on the environment.

The concept of "virtual farm consolidation"

In an earlier issue of this publication the pros and cons of actual and virtual farm consolidation were already discussed [1]. In every case, the virtual method – also called mono-management – offers a possibility to reach rapidly and without great forward planning, as well as without physically changing the landscape with all the associated costs and acceptance problems involved, an improvement of returns on labour and financial input and thus also savings in time and costs. The area where such a system is applied is usually a stretch of land with natural or road boundaries and divided into strips according to ownership or use. The idea of mono-management on such areas involves farming the area as a whole for the exploitation of degressive working times and cost-effectiveness increases from the larger field sizes without following an official farm consolidation programme. For such virtual mono-management it is necessary that farmers

sharing ownership of the area agree to a common rotation and uniform times for conducting cultivations, drilling and crop care operations. For management purposes it is in most cases practical to manipulate the type of enterprises in the area so that maximum advantage can be got from the larger strip lengths (fig. 1). At the same time it is also advisable in the short term to apply the best of the already available machinery.

Effects of a community mono-management scheme

In plans concluded in Spring 2001 at the TU Munich, the effects of community mono-management of an area in the district of Zeilitzheim in Lower Franconia were calculated [2]. It was assumed that all the farmers involved would take part, and that existing ways and strip structures would be retained. This resulted in an increase in the average strip size from a good hectare to 4.8 ha. From individual farm information gathered community-wide from 18 farmers by questionnaire, a representative crop rotation was determined with labour and cost calculations. This confirmed in the main effects which already had been calculated for individual multi-ownership areas [3]. The time required for carrying out the field work was reduced by over 30%, the labour costs by around 20% and the average gross margin rose by around € 150 per hectare whereby this difference was made up of lower labour costs, lower variable machinery costs, farm contractor discounts, discounts won during input material purchase, greater marketing power and reduced field strip margins. In a further planning scenario it was taken that through cooperation of the farmers in a multi-ow-

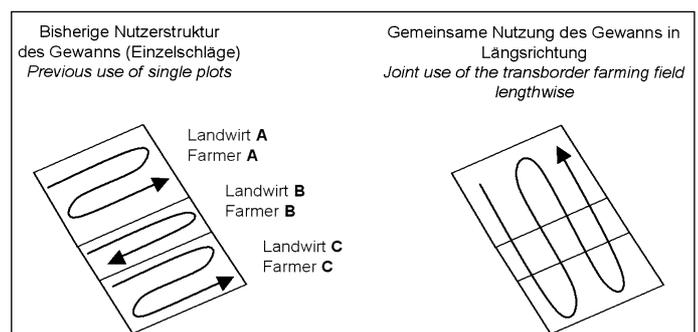


Fig. 1: Change of direction of cultivation by creating a transborder farming field

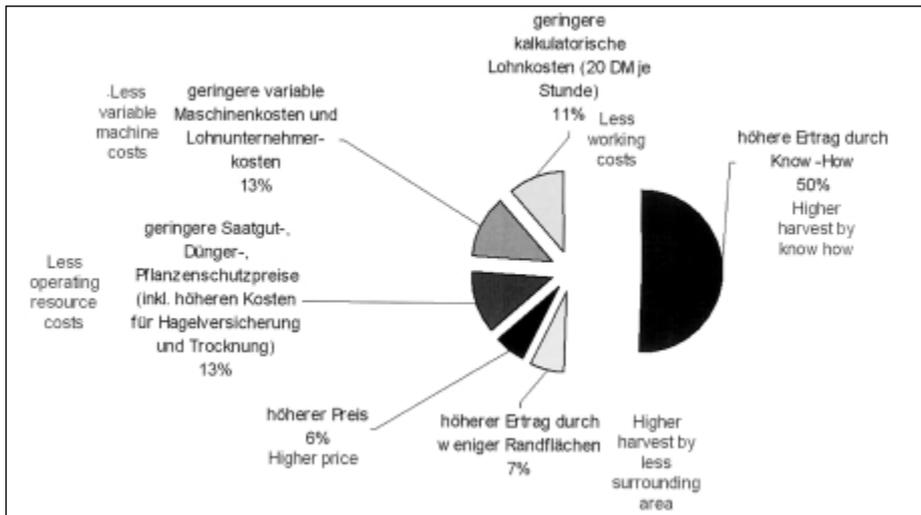


Fig. 2: Specified effects of increasing profit contribution caused by transborder farming

nership area, the in each case best available know-how for each crop could be exploited and with that in total a higher yield achieved than with the former individual strip management. Such an effect could, on average, add up to another € 150/ha gross margin, where the rotation included sugar beet (fig. 2). For Zeilitzheim with its 585 ha field area, this means a possible increase in total gross margin of between 87000 and 175000 € per year.

Ownership-oriented invoicing through farm data recording

A range of strategies presented themselves for managing the multi-ownership area [1]. The least complicated featured uniform management of the whole area including application of seed, fertiliser and plant protection sprays. However, applying spatially-specific management techniques could allow variable applications according to requirements. In this way it is possible to follow more the wishes of the individual farmers (ownership-oriented management), according to the heterogeneity of the yield potential in the location (spatially-oriented management). These management variants have been applied in the existing three multi-ownership areas within the Zeilitzheim district and will be investigated as part of the preagro research cooperative project. The invoicing of harvested amounts and for input costs and labour should however in every case be ownership-oriented. A simple invoicing according to owned area percentage of the whole area could lead to financial imbalances and social tension between the participating farmers. For this reason a comprehensive farm data recording system was installed for the Zeilitzheim project. This comprised a yield mapping system on the combines and automatic process data recording systems in the

tractor-implement combinations as well as via software based on MS Access® for the evaluation of the data and the preparation of the accounts and invoices. All field information is recorded in association with GPS so that the evaluation software can classify the individual data according to part-strip outlines in the area and based on the GPS coordinates displayed at the same time. This attributing forms the basis for the ownership-oriented invoicing for all yields and inputs during management (fig. 3). Precise investigations into the costs of the data collection have not so far been carried out because the mono-management system in Zeilitzheim is limited currently to various trial areas and part of the applied system is not yet commercially available.

Looking forward to a future mono-management

The large-scale formation of multi-ownership farming areas within a community or over several communities offers new perspectives for better-adjusted land-use. For instance this offers the possibility for larger parts of the area to be farmed more intensively or less so according to location characteristics. Vulnerable areas as far as nature

is concerned could then be appropriately managed with the required circumspect without the individual farmers being restricted regarding the total enterprise crop rotation. In the same way organic farming operations could be carried out based on the landscape and spread over a number of the former farms and not, as up until now, based on a single farm with many small separated strips. Naturally, this would only be able to take place when the appropriate regulation framework was created by the organic farming organisation.

Literature

- [1] Auernhammer, H., M. Demmel und M. Rothmund: Gewannebewirtschaftung im Projekt Zeilitzheim. Landtechnik 56 (2001), H. 3, S.136-137
- [2] Czekalla, M., G. Schütz, A. Sift und J. Zuber: Möglichkeiten der Gewannebewirtschaftung in der Gemeinde Zeilitzheim. Projektarbeit, FG Technik im Pflanzenbau, TU-München, Freising, 2001
- [3] Deiglmayr, K., O. Hahnenkamm und M. Rothmund: Planung und Bewertung einer Gewannebewirtschaftung in Zeilitzheim (Unterfranken). Projektarbeit, FG Technik im Pflanzenbau, TU-München, Freising, 2000

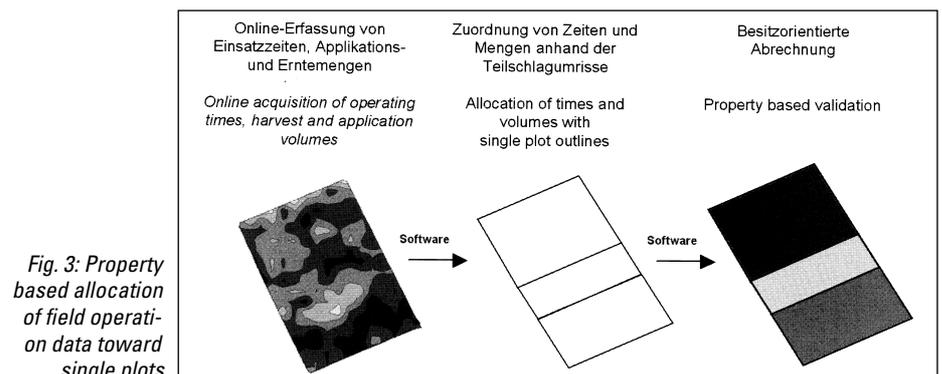


Fig. 3: Property based allocation of field operation data toward single plots