

## Bookreview

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## ENERGY MANAGEMENT AND AGRICULTURE

Proceedings of the first international summer school in Agriculture held in co-operation with the W. K. Kellogg foundation Dublin July 1981. The Royal Dublin Society 1982, 441 pp.

Energy managements is the most urgent task today. Though in agriculture solar energy is captured by photosynthesizing plants and transformed to food, an additional energy supply cannot be avoided, especially in intensive agriculture. This supply becomes more important in countries with high population growth rate and/or low arable land resources; this supply has to be covered to a great extent by fossil sources.

The reviewed book is the most comprehensive account of energy management problems in agriculture and food production up to date. In 28 chapters, written by specialists from Ireland, U.K., U.S.A. and some other countries, global aspects of energy management policies in both developing and developed countries are discussed. Attention is paid primarily to the costs of possible future trends in energy management.

The role of energy in the agriculture of U.S. and U.K. is analyzed and an overview of the energy balance of agriculture mechanization is presented. The use of unconventional energy sources, e.g. the use of fast growing trees, fuel production from biomass (ethanol, oils, biogas) etc., is discussed. These sources may become important with respect to the great energy consumption of agriculture mechanization, especially during the harvest and the drying of agricultural products.

Further contributions discuss the possibilities of better invested energy management and the use of waste products from agriculture for energy conversion.

A great share of energy input in agriculture is provided by nitrogen fertilizers. The better use of biological nitrogen fixation, esp. using legumes, could therefore significantly lower the energy requirement in agriculture. Further, great care is paid to possible genetic manipulation of non-leguminous plants to make them capable of nitrogen fixation.

Even energy sources such as wind and hydraulic energy are not omitted. The long tradition of their use in agriculture is pointed out and the ways to their renewed exploitation are outlined. Geothermal energy may be used as well, depending upon its availability and temperature; hitherto only ca. 5000 MW is being used throughout the world.

Apart from its photobiologic conversion, solar energy may be used in agriculture for heating, employing collectors and solar lenses; at the present time, their technology is advanced enough to permit their routine use. Direct conversion to electricity using solar cells is discussed further, and several devices to improve energy management of different farm types are proposed.

Further papers deal with the energy balance of animal husbandry, where the greatest energy consumption occurs. Possible ways for energy requirement reduction, including waste (e.g. manure) for energy conversion, are proposed. The high energy requirement of the glass-house industry is discussed in T. O. FLAHERTY's paper.

The final parts of the book comprise chapters on computer use in improving energy management, and prospects for energy economy in future agricultural systems. The main aims of energy in the agriculture R D programme in EEC countries are discussed.

Each contribution contains a special bibliography; in some contributions, a summary of conferences and seminars held in EEC countries dealing with the subject are appended to the bibliography.

There is no book covering the subject in such a comprehensive way. The effort of the Royal Dublin Society to arrange the first international summer school of this kind (International Summer School in Agriculture) to deal with this field is to be appreciated. The proceedings contain much up-to-date information as well as a summary of possible approaches to energy management in agriculture.

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