

Preface

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The Scientific Agricultural Society of Finland was founded on 2 December 1909 to promote and develop scientific research within the agricultural sciences. This special issue of *Agricultural and Food Science* is dedicated to the 100th anniversary of the Society, which celebrates its Jubilee Day on 2 December 2009. During the past hundred years, the Society has grown from 31 founding members to a community of nearly 500 members today. Dissemination of research results both at home and internationally has been an integral part of the hundred years of activity of the Society. The very first publication of the Society appeared in 1911 and contained scientific reports on agricultural economics, animal science, and plant science given in domestic languages with a German summary. In the same year, the Society introduced also a scientific series “*Abhandlungen der Agrikulturwissenschaftlichen Gesellschaft in Finnland*”. The *Journal of the Scientific Agricultural Society of Finland* has appeared regularly since 1928. In its present form, the Society’s journal, *Agricultural and Food Science*, is an international peer-reviewed scientific journal, and is published jointly with MTT Agrifood Research Finland.

The Society was established in circumstances, where Finland was not an independent country, and it was not self-sufficient in food production. However, towards the end of the last century, hand in hand with industrialization and urbanization, domestic production of main agricultural products often exceeded the requirements of self-sufficiency. Today, the agricultural sector in Finland and elsewhere faces global challenges, among which sufficiency of food and energy for the increasing world population in conditions of climate change are of paramount interest. At the same time, increasing environmental problems, the contribution of agriculture to pollution of the Baltic Sea for example, are of great concern. For these reasons the Editorial board announced food security, energy and environment as leading themes for this Special issue.

The food security of Finland is largely based on domestic production and is affected by the changing climate. Early results on the impact of climate change on agriculture in the northern regions were presented in this *Journal* more than ten years ago. Peltonen-Sainio et al. summarize the present situation and suggest that climate change offers new opportunities for Finnish field crop production. As current crop production is limited by the short growing season, its prolongation by climate change leads to a considerable increase in the extent of cultivable areas for the major crops. The same is true for minor crops such as oilseed rape, winter wheat, triticale, pea and faba beans, which may become major crops in the foreseeable future. On the other hand, Regina et al. point out that measures to mitigate greenhouse gas (GHG) release may require restrictions or incentives affecting the use of organic soils.

One of the most significant inventions of the 20th century, the energy-demanding Haber-Bosch process to produce ammonia and consequently inorganic N fertilizers, has revolutionized yields of cultivated plants. However, it has also led to the prevailing situation that agricultural production is heavily dependent on the use of fossil fuels. Utilization of N-fixing legumes would help to reduce dependence on inorganic N fertilizers. Stoddard et al. look at the history, present status and future prospects of legumes in Finnish agriculture. They call for investments in agronomy, physiology and breeding of legumes so that farmers can gain from the many advantages of a legume-supported rotation. These authors also remind us of the well known work of our Nobel laureate Artturi Ilmari Virtanen, whose AIV-system comprised not only of a revolutionary feed preservation method but also of a N self-sufficient cultivation method including use of red clover leys for silage production.

In this Special issue as well, Jaakkola et al. report milk production responses from a series of trials conducted with dairy cows to study the effects of replacing grass silage with whole-crop silage made from barley or wheat. Valkonen et al. focus on animal welfare, which is still a rather young research area. Their work on the effects of the provision of perches on feed consumption and behaviour of caged laying hens is topical in relation to the current animal welfare legislation.

Undoubtedly, food security largely depends on economic issues of food production. Myyrä et al. look at the growth of productivity on Finnish grain farms over the past thirty years and find that productivity increases, so crucial to the survival of farms and food industry in Finland, were driven by technical progress, while increasing farm size had only a moderate effect. Kuosmanen and Niemi explore the widening gap between the retail and producer prices of food, a phenomenon documented in both Europe and the USA.

Energy sufficiency has become one of the burning issues of our time. Nearly all agricultural functions depend also on the use of fossil energy. Mikkola and Ahokas assess energy ratios of Finnish crop and livestock production. The highest energy ratio was found for reed canary grass, which was superior to the other major crops such as grains. In general, the optimum energy ratio was gained with less N fertilizer than is currently used. In animal production, 14 to 22 % of the input energy was converted to animal products. Hakala et al. discuss the realistic potential and sustainability of field bioenergy production on the basis of FAO production statistics.

The importance of environmental issues in today's agriculture is reflected in the high number of papers dealing with this topic. A modelling approach has been applied in most of these studies. Hyytiäinen et al., among others, introduce a prototype model for evaluating agricultural nutrient abatement policies in the Baltic Sea from a national point of view. A life cycle assessment is used by Usva et al. to study the environmental impacts of food production. Of all the components of the production chain, agriculture made the most important contribution to the environmental impact.

This Special issue includes twenty scientific papers, of which a few were briefly introduced here to highlight its leading themes. The authors represent all of the core fields of agricultural sciences in Finland. On behalf of the Society I wish to thank all the authors and contributors as well as the Editorial board of the Journal for making this Special issue possible. Also the invaluable work of guest editors is greatly appreciated. This multi-disciplinary Special issue may be considered as proof of the vigour of the research community working now in the agricultural sciences in our country. Bearing this in mind, the Scientific Agricultural Society of Finland confidently anticipates meeting the challenges of the Society's second century.