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## Foreword

The First International ISMA Workshop on Noise and Vibration in Agricultural and Biological Engineering, held in Leuven, Belgium, 13–14 September in conjunction with the ISMA conference, was organized by the Laboratory of Agro-Machinery and -Processing, a part of the Department of Agro-Engineering and -Economics, The Catholic University of Leuven, K.U. Leuven, Belgium. The workshop was sponsored by the FWO (Fund for Scientific Research, Belgium). The organization of this first workshop by the Laboratory is a logical outcome of one of its most prestigious research activities in biosystems engineering.

The Department of Mechanical Engineering of the K.U. Leuven has an outstanding research tradition in noise and vibration on mechanical structures. This source of expertise of our neighbour colleagues stimulated research engineers in the Department of Agro-Engineering and -Economics to apply noise and vibration analysis and control methodologies in the research area of Biosystems Engineering. Currently, a group of more than 20 research engineers is active in this area in a broad range of applications of which about 15 are in the Laboratory of Agro-Machinery and -Processing.

The noise and vibration produced in agricultural machinery and implements are among the most severe in the world of machinery and automotive vehicles. For optimization of machinery performance, a thorough knowledge of the input noise and vibration and the machine dynamics is essential. This implies that specific control mechanisms need to be designed to attenuate unique quite noise and vibration signals with extreme magnitude and extreme low frequencies. Typical examples are noise reduction in cabins of mobile agricultural machines and the stabilization of large spray boom structures. A number of papers deal with *Machine Performance and Control*.

Optimizing tyre, cabin and seat suspension as well as isolation of cabin noise in agricultural machinery requires knowledge of the effects of the interventions on *human safety, comfort and health*. A number of papers describe the characteristics of vibrations transmitted to the driver and present solutions that might improve professional live quality of agricultural drivers.

Noise and vibration poses problems for *animal welfare* as well. Recognition of animal sounds makes it possible to interpret animal reactions to their environment and on their health.

In the highly industrialized world of food processing with automatic on-line *agro-product quality control*, analysis of the response of vibrations of agro-products to well-posed excitations creates the great possibility of using non-destructive quality evaluation techniques.

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