

HIGHER TECHNICAL INSTITUTE
MECHANICAL ENGINEERING DEPARTMENT
DIPLOMA PROJECT M/873

DESIGN OF A STONE CLEARING MACHINE
FOR AGRICULTURAL LAND

by

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Nicosia, June 1999

HIGHER TECHNICAL INSTITUTE	PROJECT NO. 3039
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PREFACE

This is a presentation of a design for a stone clearing machine. It constitutes a vital step in the design project of a stone clearing machine aiming to communicate the design to potential manufacturers of the suggested solution. It actually formulates plans for the physical realisation of the machine, which would enable its direct production and describes the decision-making process, which lead, to the final choice of the design. Reading and understanding of the project would not require the specialised knowledge mentioned above but presupposes basic knowledge of physics and some experience with machinery and production.

This project has been an exercise in both the creative and practical phases of mechanical design. It presupposed a knowledge of mathematics, computer language, English usage as well as study and experience in a number of basic engineering sciences, including physics, geometry, mechanical drawing, engineering mechanics, materials and processes and thermal fluid sciences. Apart from in-depth study of the above sciences, laboratory work was essential in gaining experience in each field. Another important factor utilised was professional experience gained by training in industries where mechanical engineering is applied. Furthermore, additional information for the project were taken from: Interviews¹ with farmers, owners of stone-clearing machines, tractors and agricultural machines in general, importers of agricultural machinery and components and mechanical engineers involved in production, visits and studies of the stages of production at industries involved in manufacture and engineering, on-site study of the operation of stone

¹ The six persons interviewed included farmers, owners of stone-clearing machines, tractors and agricultural machines in general, importers of agricultural machinery and components and mechanical engineers involved in production. Not all persons interviewed where asked the same questions included in the questionnaire, (APPENDIX 1).

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collectors and agricultural machinery, and study of related materials, visits to agricultural land that needs stone clearing, contacting government authorities .

All stages of research and analysis are described in this presentation as well as the thinking behind this project and arguments in support of the chosen solution. Detailed engineering drawings of the new design constructed according to ISO standards are also included as well as a study of the principles of operation of existing stone-clearing machines.

ACKNOWLEDGEMENTS

I am grateful to my supervisor at the Higher Technical Institute, Dr. Lazaros Lazari for his suggestions and guidance.

Also, I would like to express my thanks to my grandfather Stelios Stylianides for his support and ideas, and to Messrs. Appeshiotis, Kontos, Tappouras, Avraamides and Vinson for the useful information they have given me.

June, 1999 Nicosia

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Chapter 1: AGRICULTURE

The Gross Agricultural Output for crop production, potatoes, citrus and grapes for 1996 amounted to C£ 240,2 millions. In the national accounts for 1997 agriculture (including forestry, fishing and hunting) constitutes 5% of the Gross Domestic Product. It is noteworthy that the contribution of other sectors of the economy such as manufacturing and restaurants and hotels amount to 14% and to 10% respectively¹.

There is a need for the enhancement of the agricultural land in Cyprus. Agriculture in Cyprus has failed to keep up with technological development compared with other countries and other sectors of production. One of the problems that exist in agriculture is that nearly all agricultural land in Cyprus may be cultivated only after a stone clearing process of some kind. Therefore, there is a demand for equipment which can clear plots of lands efficiently and is simple to use and accessible to most farmers.

¹*Cyprus in Figures*, Cyprus Popular Bank, 1998.