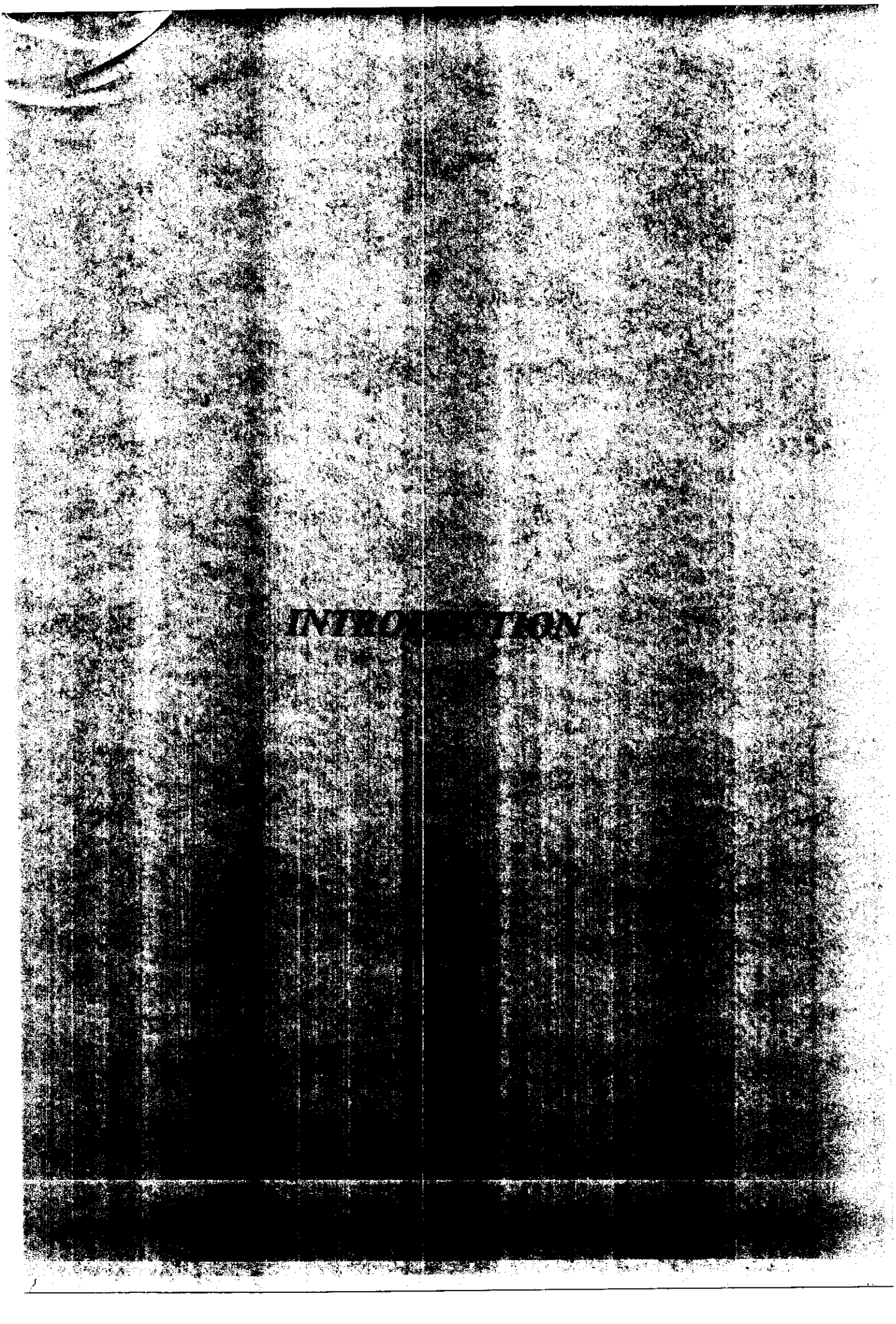

1- INTRODUCTION

Chemical pesticides play a major role in the rapid growth of agricultural production. Crop quality and yields have been improved and the use of chemical herbicides has greatly reduced labor requirements for weed control. Meanwhile, the widespread of pesticides use has resulted in some serious environmental and health problems. These problems are of direct concern to both the user and equipment designer.

Several types of sprayers can be used for field spraying. Among these sprayers are :

1- The conventional low-volume knapsack sprayers which were the most commonly used for some time in the past in pest control application.

2- The field-crop motor sprayers of high volume at a pressure ranging 10 to 30 bar, and ,

3- The low-volume blower sprayers applying concentrated spray in the form of mist carried by the air system. Aircraft spraying is also used, and has distinct advantages over ground equipment which lie in the speed of coverage, improved timeliness, and ability of spraying at times when ground equipment cannot get to the field.However, aircraft spraying requires special pilot skills, in fields bordered by wind-break trees, or aerial electric and telephone wirings. Also, drift is one of the main disadvantages in aircraft spraying and results in severe effect on neighbouring crops and animals.

Although tractor operated boom sprayer is one of the most efficient methods used in spraying, it is still applied on small scale since planting in most fields is carried out manually in non-uniform rows and with narrow spacings.

The objective of the present study is to satisfy the following requirements :

1- Study the productivity and distribution efficiency of different systems.
2- Study the factors affecting operation cost for each system
3- Comparison between systems to choose the best.
4- To input the devise results of study within a computer model program to determine the optimum system for chemical application.