

LIMITED IRRIGATION CROP SELECTION:
A LINEAR PROGRAMMING MODEL

by

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CHAPTER I

INTRODUCTION

"Linear programming is a computational method to determine the best plan or course of action, among many which are possible, when there are many alternatives for the plan, a specific or numerical objective exists for it, and the means or resources available for attaining it are limited."(1) Ever since the inception of the method of linear programming, it has been applied usefully to varied sets of problems. The calculation of an optimal plan can be accomplished by linear programming provided the objective, the limited resources, and competing means of using resources in furthering the objective, can be quantified. A linear programming problem does not exist unless there are limited resources or other restrictions which limit how much can be produced.

STATEMENT OF PROBLEM

Currently the most limiting resource for agriculture in western Kansas is usable water for irrigation. The governor's task force on Water Resources estimates withdrawals from the underground water supply to average 14 times the recharge rate.(39) With this disparity between withdrawals and recharge, it seems apparent that measures be taken to efficiently use water. The overdraft (withdrawal exceeding recharge) is caused by the rapid development of irrigation. In 1977, irrigation reached a peak of nearly 2.3 million acres of wheat, grain sorghum, corn, silage, soybeans,