

**Use of Quadratic Risk Programming in Measuring
The Effect of Resource Constraints on The Efficiency
Use of Pesticides in Tomato-Greenhouse Projects
in Riyadh and Kharj Area**

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ABSTRACT. Parametric quadratic programming was used to develop the efficiency frontier for using pesticides. The study identified four production techniques for using pesticides and fertilizers in the study area. The most important deterrent of production in Tomato Greenhouses are: Human labor, operating labor, cost of seeds, cost of fertilizer, cost of energy, and current operating capital.

The results showed that actual farm plan is very close to the efficiency frontier, and growers can be classified accordingly as extremely risk averters. The result of decreasing each resource to the value that allow using 100% of the production technique with the lowest input-output coefficient, is to shift the efficient frontier downward. The largest downward shift of the frontier happened when reducing the amount of fertilizer. Risk neutral growers are advised to use only the 3rd technique when resources are available as present, but when limited then the 4th and 3rd technique should be used in 87% and 13% of the cases respectively. For growers who are willing to bear the same risk as in the current optimum plan, the 1st technique is recommended in 30% of the cases and the rest of the techniques in equal proportion when resources are available as present. If the human and operating labor are limited, then it is advised to use the 2nd and the 4th techniques in 42% and 30% of the cases respectively.