

ANALYZING THE ECONOMIC AND
ENVIRONMENTAL IMPACTS OF
AGRICULTURAL ALTERNATIVES – THE CASE
OF VIRGINIA'S EASTERN SHORE

by

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(ABSTRACT)

The evaluation of production alternatives in agriculture requires a close examination of their economic and environmental impacts. This study was conducted to identify the crops with the highest profit potential given terminal market prices over the last five years, evaluate the feasibility of adopting new crop alternatives, given historical price information and limited production resources, and determine the potential environmental impacts of adopting new cropping strategies in Accomack and Northampton Counties on the Eastern Shore of Virginia.

A database of daily terminal price information was created to identify the market windows for specific commodities, their respective high, median and low prices, and their price variability over the last five years. A linear programming model was used to determine optimal farming operations for those farmers that grow only wheat and soybean versus farmers who are willing and able to include vegetables in their crop mix. PLANETOR, an environmental impact computer program, was used to estimate the potential soil erosion, pesticide leaching and runoff, nitrogen leaching, and phosphorous runoff for different scenarios.

The model shows that some of the new vegetable commodities could substantially increase the net returns of the farming operations in question. Romaine and Boston Lettuce were consistently selected as the most profitable alternatives while the region's traditional crops offered little competition. Wheat and soybean production showed acceptable levels of soil

erosion, as defined by the T-values for the region, and low potential for nitrogen leaching. They did, however, exhibit a higher potential for water contamination, through leaching, or runoff, of high toxicity chemicals. Although lettuce production had higher than recommended soil losses, a well-diversified crop mix offsets its negative impacts at the farm level. Lettuce also uses low toxicity chemicals, decreasing potential health hazard from their leaching or runoff. The introduction of the new vegetable commodities is recommended on the basis of the high profits that they offer, as well as the more positive pesticide leaching and runoff potential. Their final adoption, however, should take place only after establishing a well defined marketing strategy and resolving potential marketing problems.

No crop exists that could offer both high profits and have no impact on the environment. Kenaf was thought to be one, but it was soon eliminated on both grounds. This study showed, however, that the new vegetable crops considered may offer better net returns, while they do not necessarily translate into environmental disasters.