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Impacts of EPA Proposed Buffer–Zone Restrictions on Profitability of North Florida Potato Growers[1]

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Abstract

The objective of this study is to characterize the economic impact of the proposed buffer-zone restriction on the economic returns to Florida potato growers. The North Florida potato-growing area is situated in the tri-county agricultural area (TCAA) of St. Johns, Flagler, and Putnam Counties. The area grows both fresh market and processed market (chip) potatoes. The area grew 16,500 acres in the 2007 season, worth an estimated value of $81.9 million in cash receipts. The 16,500 acres represent 23.7 percent of the 70,400 acres produced for the spring market season in the United States in 2007. Results indicate that a representative grower with 400 acres of potatoes would suffer a loss of $3.52 million in net worth as a result of losing 85 percent of his land to a 700-foot buffer-zone restriction.

Introduction

Potatoes are an important crop to the state of Florida. Florida harvested 33,300 acres of potatoes in 2007, valued at $216 million in cash receipts. The tri-county agricultural area (TCAA) in Putnam, St. Johns, and Flagler Counties produces potatoes primarily for the spring market window. Producers in the tri-county agricultural area grow potatoes for both the fresh market and the processed market (also known as chippers). This area produces 23.4 percent of the nation's spring crop of potatoes (based on 70,400 U.S. harvested acres of spring potatoes in 2007). Harvest generally runs from January through July, with the North Florida area harvesting in the April through June period.

Fresh market potatoes are a high value crop, with production marketing costs totaling $4,140 per acre, or $20.70 per hundredweight (cwt) on a farm with an average yield of 200 cwt per acre (Table 1). Current potato production practices use Telone® C-35 (dichlorpropene and chloropicrin) as a preplant soil fumigant applied without plastic cover.

There is significant concern in the agricultural industry surrounding the proposed implementation of buffer zones with the application of many soil fumigation products. Buffer zones as large as 1,440 meters (4,724 feet) have been proposed for chloropicrin and methyl bromide. Potatoes require a

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buffer zone of 700 feet due to the application of Telone® C-35 without row covers. Growers estimate that this buffer zone will cause them to lose 85 percent of their current acreage in the tri-county agricultural area.

The impacts of these restrictions on individual fresh market potato growers will be significant. We have used the 85 percent estimate of land lost to buffer zones to represent the potential loss of acreage by individual growers producing fresh market potatoes.

The objective of this study is to estimate the impact that a buffer zone of 700 feet could have on a representative fresh market potato grower in North Florida. This can be accomplished by simulation of a representative fresh market potato grower with an imposed restriction on the loss of land that could result in the adoption of the buffer zone to accommodate new regulations. A representative farm model for potatoes has been developed using Simetar© software, an add-in software for Microsoft® Excel spreadsheets developed by James Richardson at Texas A&M University. A representative farm is modeled by using a production budget for fresh market potatoes and modeling the cash flow of the operation for a 10-year horizon. Prices and yields are stochastic in the model, determined by their distribution of actual prices and yields for the 1986– 2006 production periods. Yields and prices use statistical regression techniques to determine their trend over time. These trend yields and prices are then applied to the probability distribution function estimated from the data observed for 1986 to 2006. These results are then used to project yields and prices for the 2007–2016 production seasons. These yield and price projections are then simulated in Simetar with 100 iterations to estimate the potential distribution of the net present value of returns for the representative grower for the 2007–2016 time horizon. The 100 iterations allow for frequencies to be estimated for expected returns to the representative grower over this 10-year period.

The representative farm model is first simulated with no adjustments imposed by the proposed regulation to form a baseline for comparison to results that are estimated when buffer zones are imposed. The buffer-zone restriction is imposed by reducing the acreage that will be planted by the loss imposed by the buffer zone. The results of the simulations with the imposed buffer-zone restriction can be compared to the results in the baseline to provide an estimate in the loss of net present value in the farming operation resulting from the buffer-zone restrictions.

Representative Fresh Market Potato Grower

The representative fresh market potato grower was modeled using budgets published by Smith and Taylor (2007). Because the last season for which budgets were available was the 2006 production season, the budgets were updated to represent the 2008 production season by increasing the cost of diesel fuel to $4.50 per gallon and the cost of electricity to $0.11 per kilowatt hour. Material inputs (fertilizer, chemicals, and other items) were increased 30 percent to represent the increase in costs for these input expenses (Table 1). In general, it takes $3,398 in preharvest costs to grow fresh market potatoes ready to be harvested. Smith and Taylor estimate that harvesting costs are $3.71 per hundredweight (cwt) to dig, haul, grade, pack, and sell fresh market potatoes. A grower who harvests the assumed yield of 200 cwt per acre would realize harvest and marketing expenses of $742 per acre, bringing the total cost to grow, harvest, and sell the potatoes to $4,140 per acre for the 2008 season.

Yields recorded by the United States Department of Agriculture (USDA) for the 1986 to 2006 seasons show that yields have ranged from 170 cwt per acre to 330 cwt per acre, with a mean yield of 250 cwt per acre. Prices recorded by the USDA for North Florida producers represent the combined average value of fresh market and processed market potatoes. South Florida typically sells potatoes prior to the market window in North Florida. Growers indicate that potato prices are typically $3.00 lower per cwt in North Florida than in South Florida. Prices used in the simulations for North Florida growers were calculated the same as the returns to South Florida growers for each season minus $3.00 to represent the market window discount. Using this methodology, North Florida prices have ranged in values from

$7.60 per cwt to $37.00 per cwt, with a mean value of $22.66 per cwt. The yield trend shows that yields have increased over this period by about 5.1 cwt per acre annually. The price trend shows that prices have trended upward as well, increasing about $0.316 per cwt annually.

The results of the simulation show that a representative fresh market potato grower would realize a net present value for returns to potato production of $3,566,375 for growing 400 acres of fresh market potatoes each year over the 2007–2016 seasons. The simulation of the representative farm model yields a distribution of net present value of total returns ranging from $1,754,557 to $5,695,792 as a result of the distributions for price and yield.

The representative farm model was simulated with buffer zones that were anticipated to result in a loss of 85 percent of the productive land available. The results indicate that a representative grower with 400 acres normally devoted to fresh market potato production would lose $3,532,887 in net present value of the income stream from 2007–2016 if he loses 85 percent of his farmland to buffer-zone restrictions. In addition, there is a 32.7 percent probability that the farmer would experience a loss in net worth if he were to continue growing potatoes with a buffer-zone regulation that results in an 85 percent loss of productive land.

Conclusions

Loss of productive land will result in significant net worth losses to growers of fresh market potatoes. A 400-acre fresh market potato grower in North Florida could expect to realize a loss of $3,532,375 in net worth over the 2007–2016 production seasons as a result of losing 85 percent of his land due to buffer-zone restrictions should they be imposed. The loss of productive land without replacement would result in significant losses in potential gains in net worth. A grower who realizes an 85 percent land loss as a result of the proposed fumigant regulation could expect to lose almost all of the net worth anticipated from growing fresh market potatoes even without the buffer-zone restriction. Both models suggest that these regulations will have significant impacts on growers as a direct result of the loss in productive land to buffer zones.

References

Smith, Scott and Timothy G. Taylor. 2007. Hastings table potatoes estimated production costs and net returns for various price and yield combinations. Agricultural Business Center, Food and Resource Economics Department, University of Florida, Gainesville, FL. http://www.agbuscenter.ifas.ufl.edu/0506toc.php (see "Table Potatoes: Hastings" document).

Table 1. Potato production and marketing costs for fresh market potatoes grown in North Florida in the 2008 growing season.

Category	Average Per Acre	Average Per CWT
Yield	200.00	
	(*Dollars*)	(*Dollars*)
Operating Costs		
Fertilizer	550.90	
Fumigant	138.00	
Fungicide	122.80	
Herbicide	47.48	
Insecticide	35.52	
Labor	120.40	
Nematicide	202.15	
Seed	525.00	
Machinery	404.60	
Machinery Labor	160.43	
Miscellaneous Costs		
Crop Insurance	35.00	
Cover Crop	20.00	
Aerial Spray	17.25	
Farm Vehicles	44.33	
Interest	190.39	
Total Operating & Miscellaneous Cost	2,614.24	
Fixed Costs		
Land Rent	150.00	
Machinery	99.15	
Supervision	0.00	
Overhead	534.60	
Total Fixed Costs	783.75	
Total Pre–Harvest Costs	3,397.99	16.99
Harvest and Marketing Costs		
Sell Tab Potato	140.00	0.70
Sacks Tab Taters	152.00	0.76
Grade Tab Taters	310.00	1.55
Dig / Haul Potato	140.00	0.70
Total Harvest and Marketing Cost	742.00	3.71
Total Cost	4,139.99	20.70