Economics of Methyl Bromide Alternative in Pepper

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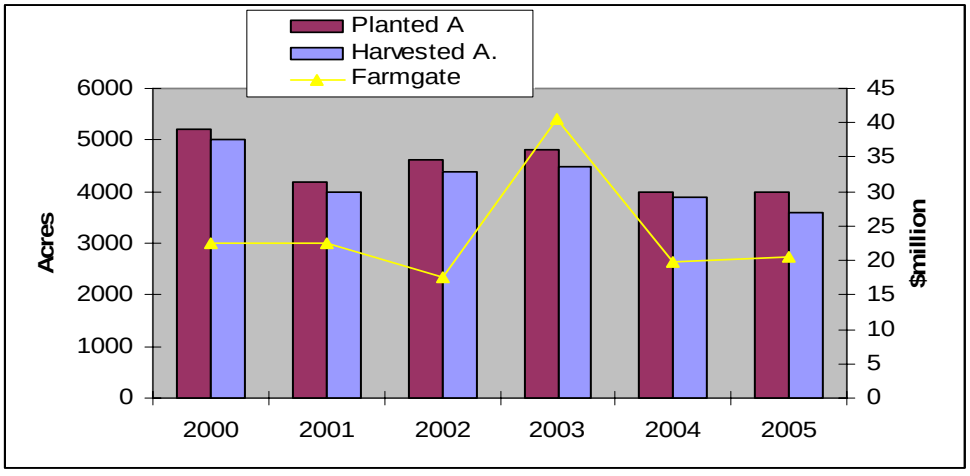
Introduction

Signatory nations of the Montreal Protocol on Substances that Deplete The Ozone Layer recommended an accelerated phase-out program for Me Br. This compound was identified as a contributor to ozone depletion. This accelerated phase-out program has put pressure on scientists the world over to come up with alternatives. This phase-out is challenging for Georgia farmers who grow certain vegetables and fruits on plasticulture such as cucumbers, eggplant, tomato, pepper, squash and strawberries. The objective of this study was to conduct an economic analysis from the preliminary agronomic data to determine financial viability of the various alternatives that are being studied (Culpepper and Langston, 2000).

Bell pepper production is one of the primary crops threatened by the loss of methyl bromide and is an important economic crop in Georgia. The farm gate value has been fairly consistent and averaged $23.0 million except in 2003 when it hit its peak at over $40.5 million (figure 1). The positive farm gate value in 2003 was as a result of a record yield of 300 cwt/acre and price of $30 per cwt. On the average, yields per acre have stabilized at about 200 cwt (Fonsah, 2005).

Figure 1: Georgia Bell Pepper Planted, Harvested Acreage and Farm Gate Value, 2005

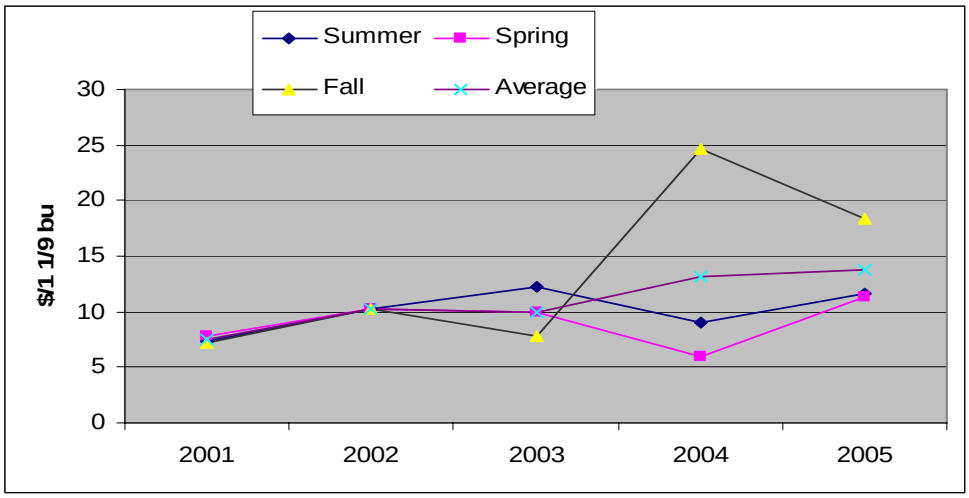


Source: Official Georgia Estimates – Bell Pepper, data compiled by Georgia Agricultural Statistics Service, various years.

Price Trend

Bell pepper seasonal prices have been erratic. For example, in the spring of 2003, prices rose to $12.18 per 1 1/9 bushel whereas in 2001, it was $7.35. In the fall of 2002, the price was $10.32 compared to $10.25 in the spring of the same year and $10.31 in the summer. The skyrocketed fall price of $24.68 was triggered by the natural shortage caused by multiple hurricanes and tropical storms that destroyed most of the farms in south Georgia in 2004. The minimum average price was in the past half a decade was $7.5 per 1 1/9 bushel in 2001 while the maximum average price was $13.83 in 2005 (figure 2).

Figure 2. Bell pepper prices received by Georgia Growers, 2001-2005



Source: Official Georgia Estimates – Bell Pepper, data compiled by Georgia Agricultural Statistics Service, various years.

Material and Methods

A research trial was conducted by scientists at the University of Georgia to assess alternative production methods to replace MeBr. The following field treatments (broadcast rates are reported for simplicity, although applications were made in bed only): (1) Methyl Bromide 67:33 at 350 lb/A (2) Telone C-35 at 18 GPA followed by KPAM at 50 GPA (3) Telone C-35 at 35 GPA followed by Chloropicrin at 150 lb/A and (4) Telone II 12 GPA and Chloropicrin at 150 lb/a were conducted in 2002 and 2003 at the Ponder Farm, Ty Ty, Georgia to identify technically efficient combinations of fumigant alternatives and herbicides that could possibly replace MeBr (Culpepper and Langston, 2000). Data collected from these preliminary field trials were converted into an enterprise cost and return estimates. Although the yield used was a combination of Jumbo, extra large, large fruit sizes, it was obtained from the field data. On the other hand, prices used were the average of the three fruits sizes and was obtained from USDA/ERS data for 2003. We purposively did not use 2004 data because the price was considered an outlier. The cost and return estimates were then analyzed with conventional MeBr production system to determine their comparative financial feasibility.

Results and Discussions

The enterprise budget analysis for Georgia bell pepper using a combined average yields and prices showed that Telone C-35 followed by KPAM had the highest combined yield of 1,298 cartons per acre. Telone II followed by Chloropicrin generated the lowest yield of 1,119 boxes per carton (Table 1) (Fonsah and Rucker, 2002).

Table 1: Preliminary Enterprise Pepper Budget and Break-Even Analysis to determine a possible replacement for MeBr, 2005.

Enterprise Pepper Budget - Break-even Analyses				
	Methyl Bromide	C35 & KPAM	C35 & Chloropicrin	Telone II & Chloropicrin
Activity Measures				
Yield (cartons)	**1,167**	**1,298**	**1,155**	**1,119**
Gross Return	$13,627	$15,156	$13,487	$13,070
Fumigant System Cost	**$405**	**$786**	**$1,007**	**$528**
Other Variable Cost	$10,869	$11,682	$10,794	$10,548
Total Variable Cost	$11,247	$12,468	$11,801	$11,076
Total Fixed Cost	$860	$920	$954	$879
Net Returns	**$1,520**	**$1,768**	**$732**	**$1,115**
Break-even Statistics				
Break-even Revenues	$12,107	$13,388	$12,755	$11,955
Break-even Yield	1,037	1,146	1,092	1,024
Break-even Price	$10.38	$10.32	$11.05	$10.68

This initial result revealed that Telone C-35 followed by Chloropicrin showed the highest total variable cost of $12,468 per acre compared to the other combinations. Furthermore, Telone C-35 followed by KPAM generated the highest net returns of $1,768, thus out performing MeBr, Telone C-35 followed by Chloropicrin and Telone II followed by Chloropicrin (Fonsah, 2005; Fonsah and Rucker, 2002).

The results of the break-even analysis conducted depicted that Telone C-35 and KPAM generated the highest break-even revenue and the lowest break-even price of $10.32 per acre compared to $10.38 for MeBr, $11.05 per acre for Telone C-35 followed by Chloropicrin and $10.68 for Telone II and Chloropicrin, respectively.

Conclusion

A combination of Telone C35 followed by KPAM in our preliminary field trials outperformed MeBr. Furthermore, a preliminary enterprise bell pepper cost and break-even analysis aimed at determining a possible replacement for MeBr, revealed

that Telone C-35 followed by KPAM provided economic viable alternative. Further research is underway to validate these results.

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