Assessing Stochastic Budget Scenarios for Georgia Family Farms: The Case of Blueberries

Bennett Oliver[1], Vanessa P. Shonkwiler[1&2], and Cesar Escalante[1]
University of Georgia, College of Agricultural and Environmental Sciences, [1]Department of Agricultural and Applied Economics, [2]Center for Agribusiness and Economic Development.

UNIVERSITY OF GEORGIA EXTENSION
Agribusiness and Economic Development

SARE Sustainable Agriculture Research & Education

Introduction

Blueberry enterprise budgets can provide critical input for farm planning, including the potential income for a particular farm, the size of farm needed to earn a potential return, and anticipated cash flows during the year (Sahs and Bir, 2020). However, inaccurate blueberry budgets give farm managers and producers too much confidence which can lead to unattainable profits, unexpected debt, and sometimes insolvency. Stochastic budgeting allows for important variable factors such as inputs, yield, and revenues of blueberries to be analyzed as statistical distributions instead of point estimates (Jason et al., 2007**). Stochastic budgeting better estimates outcomes** since it answers the 'what if' question since it incorporates risk and uncertainty in the blueberry production process (Hardaker et al., 2015).

In terms of marketing, labels allow producers to add value to their products by distinguishing their products from competitors. Consumers are becoming more interested in the agricultural practices and nutritional facts in the foods they are buying (Kuchler et al., 2017). Therefore, labels are becoming an important part of producers' marketing strategy.

Sponsored by Southern Sustainable Agriculture Research and Education (SSARE), our study focuses on **a further understanding of buyers' preferences and perceptions on labeling and co-labeling strategies in the South** when purchasing fruits and vegetables with a particular emphasis on direct marketing from local farms. This study is part of a bigger project aimed at increasing small producers' long-term profitability and buyers' retention.

Methodology

To keep the budgeting model simple, **only the variables that are deemed to be most important in the decision-making process are allowed to fluctuate as a stochastic variable** (Jason et al., 2007; Ludena et al., 2010). In this study, we determined prices received and yield to be the stochastic variables. We used the single-point estimates for all the costs in the production of blueberries that were estimated from the deterministic budget developed by the University of Georgia's Department of Agriculture and Applied Economics. We applied the Monte Carlo simulation approach using triangular distribution for both price and yield based on historical prices and yields of blueberries in Georgia

Four different labeling strategies were used and compared using stochastic budgeting. The four labeling strategies were: **no labels, Georgia Grown labels, organic labels, and a co-labeling** approach that includes both Georgia Grown labels and organic labels. Organic premiums for blueberries were calculated from USDA's AMS Weekly Retail Organic Price Comparison. Shonkwiler, V. (2023) choice experiment informed own state premium to be $0.20 for cherry tomatoes, so we extended a constant $0.20 premium for Georgia Grown blueberries. Since blueberries are perennial, we budgeted them for one year in full production.

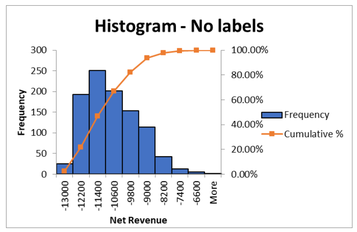
Results

PROJECTED NET REVENUE

✓ **Figures 1 to 4** illustrate the projected net revenue of blueberries grown in Georgia using zero labels, Organic label, Georgia Grown label, and a co-labeling approach combining Organic and Georgia Grown labels.

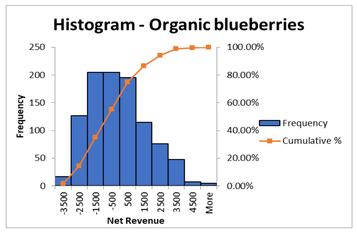
› The minimum net revenue; mean net revenue; and maximum net revenue are indicated for each scenario.

Figure 1



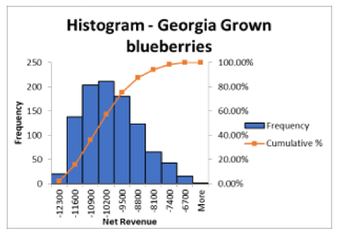
Minimum: $ (13,268.40)
Mean: $ (11,089.20)
Maximum: $ (6501.73)

Figure 2



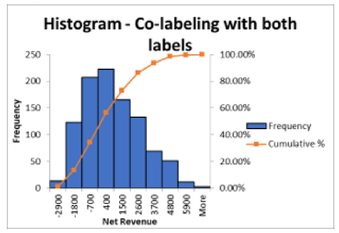
Minimum: $ (3,843.28)
Mean: $ (615.39)
Maximum: $ 6,208.69

Figure 3



Minimum: $ (12,641.50)
Mean: $ (10,317.90)
Maximum: $ (6,316)

Figure 4



Minimum: $ (3,203.76)
Mean: $ 325.80
Maximum: $ 7,010.11

The percent change in net returns:

✓ Organic compared to no label: **94.45%.**

✓ Georgia Grown compared to no label: **6.96%.**

✓ Co-labeling compared to no label: **102.94%.**

BREAKEVEN PERCENTAGES

Table 1 presents the breakeven percentages for the 4 different labeling options.

Table 1: Breakeven percentage – Blueberries

No labels	**0%**
Organic Label	**33.9%**
Georgia Grown Label	**0%**
Organic and Georgia Grown labels	**50.4%**

Discussion

Based on these results, we suggest that:

1. The **application of at least one labeling alternative improves net returns** compared to the status quo (no labeling) case.

2. The use of Georgia Grown labels can improve net returns slightly while production method-labeling alternatives (such as Certified Organic label) produce more significant net return improvements.

3. The net return effect of labeling is further significantly "optimized" when **combinations of geographic** (e.g., Georgia Grown) **and production method** labeling alternatives are used.

References

- Hardaker, J. B., Lien, G., Anderson, J. R., & Huirne, R. B. (2015). Coping with Risk in Agriculture: Applied Decision Analysis (3rd ed.). Boston: CAB International.
- Jason, R.E., Sperow, M., D'Souza, G.E. & Rayburn, E.B. (2007). Stochastic simulation of pasture-raised beef production systems and implications for the Appalachian cow-calf sector J. Sustain. Agr. 30 4 27 51.
- Kuchler, F., Greene, C., Bowman, M., Marshall, K. K., Bovay, J., & Lynch, L. (2017). Beyond Nutrition and Organic Labels—30 Years of Experience With Intervening in Food Labels. Economic Research Report, 239 p.
- Ludena, C. E., McNamara, K., Hammer, P. A., & Foster, K. (2003). Development of a stochastic model to evaluate plant growers' enterprise budgets. American Agricultural Economics Annual Meeting, Montreal, Quebec, 27–30 July.
- Sahs, R., & Bir, C. (2020). Using Enterprise Budgets in Farm Financial Planning.
- Shonkwiler, V. (2023) Southern vegetable buyers' preferences for cherry tomatoes based on production practice and detailed information on location of production – SAEA Conference, February 2023, Oklahoma.