



**AgEcon** SEARCH  
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

## **Product Liability Insurance Use Among Tennessee Fruit and Vegetable Farmers**

Matthew Edwards<sup>a</sup>, Margarita Velandia<sup>Ⓟb</sup>, Christopher D. Clark<sup>c</sup>, Dayton M. Lambert<sup>d</sup>,  
Wendell H. Pepper<sup>e</sup> and Kimberly Jensen<sup>f</sup>

<sup>a</sup>Research Assistant, <sup>b, d</sup>Associate Professor, <sup>c, f</sup>Professor, Department of Agricultural and Resource Economics,  
The University of Tennessee, Knoxville, 2621 Morgan Circle, 314C Morgan Hall, Knoxville TN 37996, USA  
Tel: 865-974-7409. Email: [mvelandia@utk.edu](mailto:mvelandia@utk.edu).

<sup>e</sup>Financial Analyst Specialist, Center of Profitable Agriculture, The University of Tennessee,  
103 Morgan Hall, 2621 Morgan Circle, Knoxville, TN 37996-4506, USA

---

---

### **Abstract**

Product liability insurance can help farmers manage product liability risk and gain access to additional market outlets. Data from a survey of Tennessee fruit and vegetable producers were used to evaluate differences between product liability insurance users and non-users, barriers associated with the use of this type of insurance, along with insurance coverage amounts and costs. Findings suggest that primary occupation, percentage of income from farming, size of fruit and vegetable operation, and market outlets used may influence the decision to purchase product liability insurance. Barriers to use include perceived costs of product liability insurance and limited understanding of liability insurance policies.

**Keywords:** insurance, liability, Tennessee fruit and vegetable farmers, marketing

---

<sup>Ⓟ</sup>Corresponding author

## Introduction

Fruit and vegetable producers are subject to an array of risks, from those typically associated with producing and marketing agricultural products (e.g., production and price risk), to risks associated with product liability (Cook 2011). Between 2003 and 2012, fruits and vegetables were linked to 26% of foodborne illness cases reported to the United States (US) Centers for Disease Control and Prevention; more than any other food group (DeWaal et al. 2015). In addition, produce recalls frequently make headlines in national news media outlets, increasing the food safety concerns of U.S. consumers (Goetz 2012; Grossman 2015). The resulting costs are large, and include health-related costs, the loss of productivity from missed workdays and, in severe cases, even death (Buzby and Roberts 2009). For example, the average annual economic burden associated with foodborne illness in the United States linked to fifteen major pathogens was recently estimated to be \$15.5 billion (Hoffmann, Maculloch and Batz 2015).

In response to widespread concerns and demand for a safer food supply, the focus of public and private initiatives to reduce the incidence of foodborne illnesses has shifted from response-based mechanisms to prevention. For example, the Food Safety Modernization Act imposes new quality assurance and safety measures across the entire food supply chain (U.S. FDA 2011). Voluntary action by participants along the food supply chain has also become more common, such as the adoption of voluntary food safety standards and agreement to submit to audits that verify compliance by members of the California Leafy Green Handler Marketing Agreement (Palma et al. 2010).

While preventive food safety measures mitigate the risk of foodborne illnesses, producers may still face risks in the form of legal actions from consumers seeking financial compensation for damages suffered as a result of contracting a foodborne illness (Connally 2009). Mahdu (2015) reviewed the outcomes of 511 foodborne illness lawsuits between 1979 and 2014, finding that compensation to successful plaintiffs ranged from \$151 to \$6.2 million. These amounts do not include court costs and legal fees, which can be sizable in their own right and are typically incurred by defendants regardless of the outcome of the lawsuit (Henson and Hooker 2001).

Enhancements in traceability systems, which allow products to be tracked from their point of production to the final consumer, may increase the likelihood of a producer being held accountable for injuries suffered as a result of foodborne illness (Aung and Chang 2014).

One way for producers to mitigate these risks is to purchase product liability insurance. However, results from a survey of small- and medium-sized specialty crop producers in the southeastern US conducted in 2013 suggest that, although product liability risk seems to be a concern for these producers, their understanding of product liability insurance policies is limited (Boys 2013). Boys' results also suggest that a large percentage of specialty crop farmers perceive product liability insurance as a tool to manage product liability, as well as improve market access and strengthen a firm's reputation among potential buyers.

Since the competitiveness and profitability of small- and medium-sized fruit and vegetable producers is, to some extent, tied to their ability to cope with potential risks and access favorable markets, the objectives of this study are to understand the: (1) differences in the characteristics of

those fruit and vegetable producers (e.g. farm operators) who use product liability insurance and those of who do not; (2) common product liability coverage amounts carried by fruit and vegetable producers; (3) the annual cost of product liability insurance coverage for fruit and vegetable producers; (4) sources used to obtain information about product liability insurance products; and (5) perceived barriers to using product liability insurance.

This information may help producers make more informed decisions regarding the use of product liability insurance and help Extension personnel design educational programs to help producers better manage product liability risk. The findings may also help insurance companies market product liability insurance to fruit and vegetable producers.

## Methods

The data used in this study were obtained from a survey of Tennessee fruit and vegetable producers conducted in 2013. Development of the survey questionnaire was informed by two focus group sessions with fruit and vegetable producers conducted in two Tennessee counties (Williamson and Bledsoe counties) in 2012. The survey list frame consisted of 495 fruit and vegetable producers listed in the Tennessee Department of Agriculture's Pick Tennessee Products program. A cover letter explaining the purpose of the study, a copy of the questionnaire, and a prepaid return envelope were mailed on April 1, 2013. No incentives for completing the survey were offered to potential respondents. Postcard reminders were sent out on April 19, 2013. A final mailing containing a new cover letter, a second copy of the questionnaire, and another prepaid return envelope was sent to producers who had not yet returned the survey on April 29, 2013.

A total of 163 surveys were completed and returned. Out of these 163 surveys, 18 were from producers who either no longer produced and/or sold fruits and/or vegetables, or farmers who produced fruits and vegetables only for personal consumption. These observations were eliminated, resulting in 145 usable responses and an overall response rate of 30%.

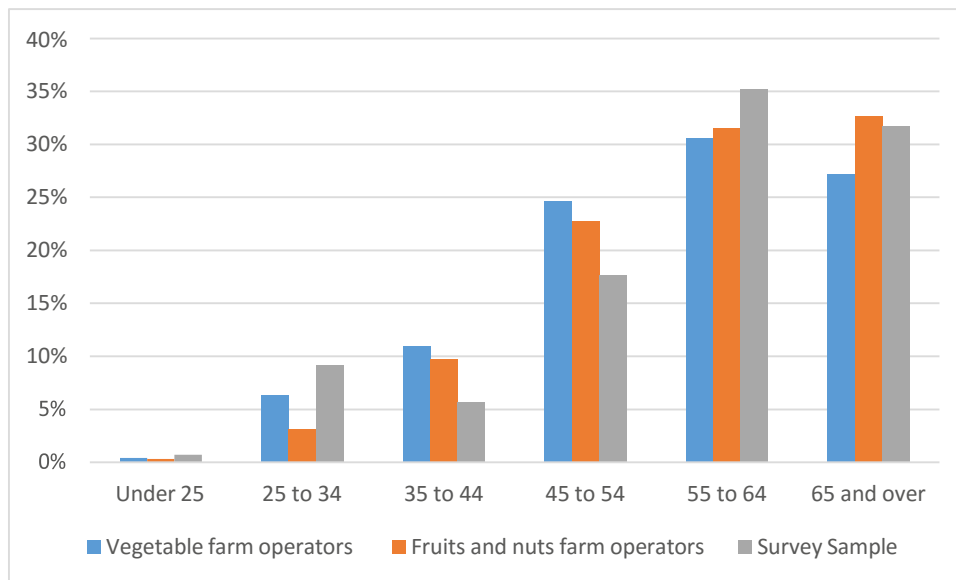
Given the likelihood of limited producer understanding of product liability insurance (Boys 2013), the first page of the questionnaire introduced the concepts of product liability risk and product liability insurance. Product liability risk was described as: "*Liability risks* in that consumers can take legal actions against producers demanding monetary compensation claiming the food they purchased made them sick." As for product liability insurance, respondents were informed that: "Product liability insurance may help protect producers by limiting their possible exposure to risks associated with consumers' claims of injury caused by harmful or contaminated products." The questionnaire included questions about producer risk perceptions; familiarity with and use of risk management tools including *product liability insurance*; cost and coverage of insurance products providing product liability coverage; reasons for not using product liability insurance; sources of information about product liability insurance; and general farm operator and farm business characteristics.<sup>1</sup> Farm business and operator characteristics of product liability insurance users and non-users were compared using independent sample t-tests.

---

<sup>1</sup> The survey questionnaire is available from the authors upon request.

## Results

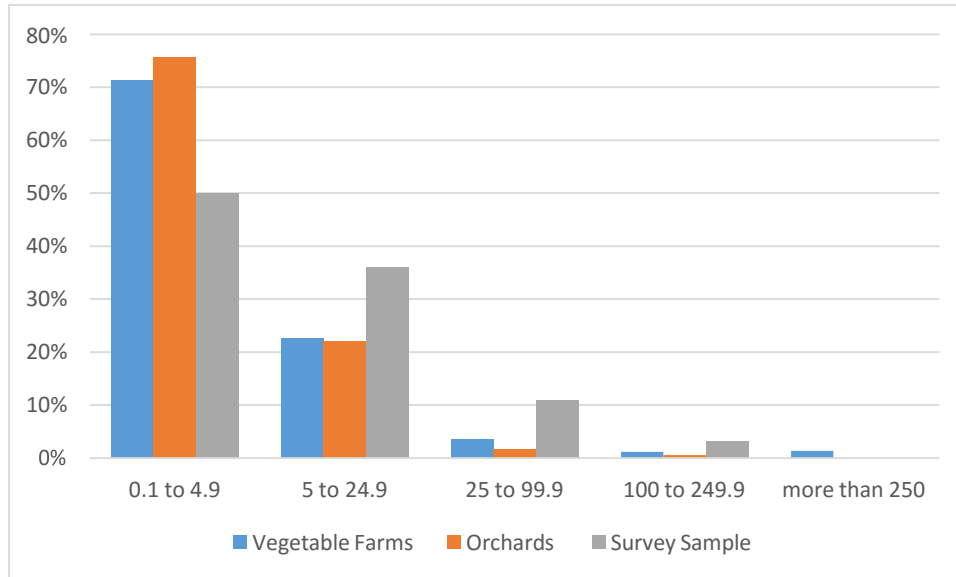
The survey sample was generally representative of fruit and vegetable producers in Tennessee. Given that the 2012 Census of Agriculture does not report statistics for producers in the “fruit and vegetable” category, but rather reports statistics for the vegetable and fruit categories separately, the survey sample characteristics are compared with population characteristics for both fruit and vegetable categories separately to evaluate if the sample used in this study is representative of the population. The age distribution of survey respondents generally mirrors the age distribution of vegetable and fruit producers in Tennessee, with a larger representation of those farmers in the 25–34 and the 55–64 age categories in the survey sample (Figure 1).



**Figure 1.** Comparison of age distribution of survey sample and Tennessee fruit and vegetable farmers as reported in the 2012 census of agriculture.

Further, the average age of the respondents was fifty-eight years, which is close to the average age of farmers (i.e., fifty-nine) in Tennessee (USDA/NASS 2012). Similar to the sample age distribution, the sample distribution of acreage in fruits and vegetables generally follows the acreage distribution of vegetable farms and orchards<sup>2</sup> in Tennessee. However, the survey sample seems to over-represent fruit and vegetable farms in the five to twenty-five acre range and under-represent farms in the 0.1 to 4.9 acre range (Figure 2).

<sup>2</sup> Farm size categories are presented only for orchards, not for the “all fruits” category.



**Figure 2.** Comparison of acreage on fruits and vegetables distribution of survey sample and Tennessee fruit and vegetable farmers as reported in the 2012 census of agriculture.

#### *Adopters and Non-Adopters*

The percentage of survey respondents who indicated they had an insurance policy providing product liability coverage (i.e., adopters) in 2013 was 28% (40); while 55% (80) of respondents indicated they did not have this type of insurance policy; 8% (11) did not know if their insurance policy provided product liability coverage; and 10% (14) did not answer the question (Table 1). Of the 40 producers who believed that they had product liability coverage, slightly less than half (18) indicated that it was required by a market outlet they currently used to sell their produce. Most of the respondents who indicated their market outlet required them to carry a product liability insurance policy (i.e., 11 out of 18 respondents) were selling produce only through direct-to-consumer outlets—specifically farmers markets, road side stands, and/or on-farm sales. The remainder of the respondents who indicated their market outlet required a product liability insurance policy sold their products through direct-to-consumer outlets in combination with other outlets such as wholesale brokers, grocery stores, food cooperatives, and restaurants. Although it is likely that many producers make the decision to use product liability insurance because the market outlets they use to sell their produce require they carry such a policy, these results suggest that a substantial percentage of farmers—55% of respondents who believed that they have product liability coverage—use product liability insurance even if the market outlets they use to sell their produce do not require it.

Tennessee fruit and vegetable producers who used product liability insurance coverage were more likely to farm full time, manage more acreage in fruits and vegetables, have a larger percentage of sales made through intermediate market channels (i.e., grower cooperatives, wholesale buyers/brokers/packers, and other farmers), have higher household incomes, and a larger percentage of income from farming than non-adopters. Nearly two-thirds (64%) of respondents who used product liability insurance were full-time farmers while only one-third

(33%) of respondents who did not use product liability insurance were full-time farmers. This difference was significant at the 1% level (Table 1). Similarly, the percentage of adopters with at least half of their household income from farming (53%) was significantly greater than the percentage of non-adopters with over half of their income coming from farming (22%) (Table 1). These results suggest that farmers who are more dependent on farming as a primary source of income are more likely to purchase product liability insurance to manage product liability risk.

**Table 1.** Variable means for product liability insurance Adopters and Non-Adopters.

|   |     | Mean               |                                 |                        |
|---|-----|--------------------|---------------------------------|------------------------|
|   |     | Alla<br>(n=145)    | Adopters <sup>b</sup><br>(n=40) | Non-Adopters<br>(n=80) |
| <b>Farmer Characteristics:</b>  |     |                    |                                 |                        |
| Age of farmer   |     | 57.59<br>(13.46)c  | 56.35<br>(12.65)                | 58.47<br>(14.23)       |
| Years of experience farming   |     | 23.77<br>(16.45)   | 25.90<br>(15.42)                | 22.09<br>(16.88)       |
| Years selling fruits or vegetables                                    | *   | 14.51<br>(12.79)   | 16.63<br>(12.90)                | 13.04<br>(12.25)       |
| Attained bachelors or graduate degree (%)                             |     | 49.31<br>(50.17)   | 50.00<br>(50.64)                | 52.50<br>(50.25)       |
| Full-time farmer (%)  | *** | 43.97<br>(49.81)   | 64.10<br>(48.59)                | 32.91<br>(47.29)       |
| Generates at least 50% of household income farming (%)                | *** | 30.88<br>(46.37)   | 52.63<br>(50.60)                | 21.33<br>(41.24)       |
| At least \$75,000 in total household income (%)                       | *** | 40.74<br>(49.32)   | 59.46<br>(49.77)                | 34.67<br>(47.91)       |
| <b>Farm Characteristics:</b>  |     |                    |                                 |                        |
| Size of farming operation (acres)                                     | *   | 104.22<br>(367.94) | 189.52<br>(600.36)              | 71.03<br>(217.48)      |
| Size of fruit and vegetable operation (acres)                         | *** | 13.54<br>(29.46)   | 26.44<br>(49.52)                | 7.74<br>(10.36)        |
| Fresh market sales of fruits and vegetables<br>(% Gross Annual Sales) | *   | 57.10<br>(39.19)   | 51.22<br>(37.31)                | 62.11<br>(39.27)       |
| <b>Market Outlets:</b>  |     |                    |                                 |                        |
| Direct sales to consumers (% of total sales)                          | **  | 89.66<br>(24.33)   | 83.52<br>(28.00)                | 93.31<br>(20.17)       |
| Sales to intermediaries (% of total sales)                            | *** | 5.22<br>(17.06)    | 11.54<br>(24.71)                | 1.85<br>(9.97)         |
| Sales to retail outlets (% of total sales)                            |     | 5.12<br>(15.95)    | 4.94<br>(12.18)                 | 4.84<br>(17.06)        |

**Note.** <sup>a</sup>Of the 145 respondents, 11 did not know if their insurance policy provided product liability coverage, and 14 did not answer the product liability insurance use question. <sup>b</sup>Variable means in columns two (adopters) and three (non-adopters) were compared using independent sample t-tests. <sup>c</sup>Standard deviation of each variable is in parenthesis. \*, \*\* and \*\*\* denote significant differences in means at the 10%, 5%, and 1% levels respectively.

The percentage of adopters with household income of at least \$75,000 (59%) was significantly higher than the percentage of non-adopters with the same income level (35%) (Table 1). The

difference in fruit and vegetable acres farmed between adopters (26 acres) and non-adopters (8 acres) was significant at the 1% level (Table 1). Producers with higher incomes and more acres in fruit and vegetable production may have more assets at risk and greater exposure to product liability risk and, therefore, may be more likely to adopt measures to protect themselves against this type of risk.

The percentage of sales to intermediaries (i.e., grower cooperatives, wholesale buyers/ brokers/ packers, and other farmers) by product liability insurance adopters (12%) was about 10% higher than the percentage of sales made through this same outlet by non-adopters (2%) (Table 1). Although the average percentage of sales made by respondents to intermediaries was small (5%), this finding suggests that producers selling through intermediate market channels may be more likely to purchase product liability insurance. This finding may be due to the fact that some intermediate market outlets require producers to carry product liability insurance, and producers may choose to purchase product liability insurance as a marketing strategy to access these outlets (Boys 2013).

#### *Characteristics of Product Liability Insurance Coverage and Reasons for Non-Adoption*

Coverage amounts reported by adopters of product liability insurance ranged from less than \$100,000 (12%) to between \$3 million and \$3.9 million (9%), with coverage between \$1 million and \$1.9 million being the most common (41%) (Table 2). The most common annual cost of product liability insurance (i.e., the premium) reported by adopters was between \$1,000 and \$2,000 (38%), followed by an annual cost of coverage of less than \$1,000 (32%) (Table 2). The cost of between \$100,000 and \$1 million of product liability coverage was between \$1,000 and \$3,000. The cost of policies covering \$3 million or more started at \$2,000 per year, but went as high as \$5,000 or more per year. In practice, the cost of product liability insurance is determined not only by the coverage amount, but also by the producer's estimated annual gross sales (Spilker 2015). Thus, the costs of insurance policies providing the same amount of product liability coverage can vary from one farm to another.

About 33% of product liability insurance adopters rated their level of understanding of their product liability insurance policy below four on a scale of one to seven, where one is little or no understanding and seven signifies great understanding. Only about 19% of adopters claimed to have a great understanding of their insurance policies (i.e., a seven). These results suggest that there may be a considerable number of producers who have product liability insurance but have limited understanding of the product they purchased. These findings expand on results from Boys (2013) that suggest all specialty crop producers, and not only adopters of product liability insurance, are generally uninformed about the need for this insurance and the coverage they carry or have to carry for this type of liability. Most product liability insurance adopters (95%) learned about product liability insurance policies through insurance agents. After insurance agents, other farmers (27%) and Extension/University sources (24%) were the most popular sources of information among product liability insurance users (Table 3).



**Table 2.** Percentage of Adopters by product liability insurance coverage; amount and annual cost

| Coverage <sup>b</sup>         | Annual Cost   |                            |                          |                          |                          |                          | Total                                  |
|-------------------------------|---|----------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--|
|                               | Under \$1,000   | \$1,000 to \$1,999         | \$2,000 to \$2,999       | \$3,000 to \$3,999       | \$4,000 to \$4,999       | \$5,000 and up           |  |
| <b>Under \$100,000</b>        | 3.00 <sup>c</sup><br>75.00% <sup>d</sup><br>27.27% <sup>e</sup> | 1.00<br>25.00%<br>7.69%    | 0                        | 0                        | 0                        | 0                        | 4.00<br>100.00%<br>11.76% <sup>g</sup> |
| <b>\$100,000 to \$299,000</b> | 1.00<br>25.00%<br>9.09%   | 3.00<br>75.00%<br>23.08%   | 0                        | 0                        | 0                        | 0                        | 4.00<br>100.00%<br>11.76%              |
| <b>\$300,000 to \$599,000</b> | 0   | 3.00<br>75.00%<br>23.08%   | 1.00<br>25.00%<br>50.00% | 0                        | 0                        | 0                        | 4.00<br>100.00%<br>11.76%              |
| <b>\$600,000 to \$999,000</b> | 1.00<br>50.00%<br>9.09%   | 1.00<br>50.00%<br>7.69%    | 0                        | 0                        | 0                        | 0                        | 2.00<br>100.00%<br>5.88%               |
| <b>\$1- to \$1.9 million</b>  | 6.00<br>42.86%<br>54.55%  | 4.00<br>28.57%<br>30.77%   | 0                        | 1.00<br>7.14%<br>33.33%  | 2.00<br>14.29%<br>100%   | 1.00<br>7.14%<br>33.33%  | 14.00<br>100.00%<br>41.18%             |
| <b>\$2- to \$2.9 million</b>  | 0   | 1.00<br>33.33%<br>7.69%    | 0                        | 1.00<br>33.33%<br>33.33% | 0                        | 1.00<br>33.33%<br>33.33% | 3.00<br>100.00%<br>8.82%               |
| <b>\$3- to \$3.9 million</b>  | 0   | 0                          | 1.00<br>33.33%<br>50.00% | 1.00<br>33.33%<br>33.33% | 0                        | 1.00<br>33.33%<br>33.33% | 3.00<br>100%<br>8.82%                  |
| <b>Total</b>                  | 11.00<br>32.35% <sup>f</sup><br>100.00%                         | 13.00<br>38.24%<br>100.00% | 2.00<br>5.88%<br>100.00% | 3.00<br>8.82%<br>100.00% | 2.00<br>5.88%<br>100.00% | 3.00<br>8.82%<br>100.00% | 34.00<br>100.00%<br>100.00%            |

**Note.**<sup>a</sup>Only respondents who indicated having product liability coverage provided information about cost. There were 34 respondents who answered the question about product liability annual cost. <sup>b</sup>Only respondents who indicated having product liability coverage provided information about coverage. There were 34 respondents who answered the question about coverage level. <sup>c</sup>Number of respondents in each coverage and annual cost category. <sup>d</sup>Percentage of observations from first row category in first column category. <sup>e</sup>Percentage of observations from first column category in first row category. <sup>f</sup>Percentage of total observations in the first column category. <sup>g</sup>Percentage of total observations in the first row category.

When asked to choose the primary reason for not using product liability insurance, 34% of the producers without product liability coverage considered it to be too expensive (Table 4). This rationale was the most frequently chosen, followed by 19% of producers who felt coverage was not necessary given their current marketing and production practices. This latter finding is consistent with previous research that suggests that some specialty crop farmers believe having product liability insurance is not necessary due to their good on-farm handling practices (Boys 2013).

**Table 3.** Percentage of adopters by sources of information.

| <b>Information Source</b>                 | <b>Percentage<sup>ab</sup></b> |
|---|--------------------------------|
| Insurance Agent                           | 94.60                          |
| Other Farmers                             | 27.03                          |
| Extension/University Sources              | 24.32                          |
| Farm Manager or Consultant                | 5.41                           |
| Social Networks (e.g., Facebook, Twitter) | 2.70                           |
| Popular Press                             | 2.70                           |
| Other (“Research, Internet”)              | 2.70                           |

<sup>a</sup>Percentages do not add to 100% because adopters could select more than one source of information. <sup>b</sup>Only respondents who indicated having product liability coverage provided information about product liability insurance information sources. There were 37 respondents who answered the question about information sources.

**Table 4.** Percentage of respondents by adoption barrier.

|  | <b>Percentage</b> |
|--|-------------------|
| <b>Economic</b>                                    |                   |
| Affordability of insurance                         | 33.84             |
| At scale of current operation, cost is prohibitive | 16.42             |
| <b>Perceptions</b>                                 |                   |
| Low risk marketing and/or production activities    | 19.40             |
| Personal choice                                    | 7.46              |
| <b>Lack of Information</b>                         |                   |
| Insurance (e.g. availability, providers)           | 17.91             |
| Product liability risk                             | 5.97              |

## Conclusion

Data from a survey of Tennessee fruit and vegetable farmers were used to generate insights about the use of product liability insurance among fruit and vegetable producers and the characteristics of farms and operators who use product liability insurance. Findings suggest that producers purchasing product liability insurance manage larger fruit and vegetable operations, have higher household incomes, earn a larger percentage of household income from farming, and are more likely to sell their produce through intermediate market outlets. Survey responses suggest that some users of product liability insurance are likely motivated by the opportunity to access market outlets requiring such insurance, while others choose to purchase product liability insurance for other reasons. On the other hand, responses suggest that one of the major barriers to the use of product liability insurance is the perceived cost. The cost of product liability insurance is a function of both the amount of coverage and the farm’s annual gross sales. Therefore, although the most common cost stated by producers is \$1,000, cost varies across coverage amounts and farms. A producer considering the purchase of product liability insurance should

evaluate both the costs and benefits associated with this risk management tool. The benefits associated with the adoption of product liability insurance include the possibility of increased sales as a result of expanded access to market outlets requiring suppliers to carry product liability insurance, as well as a limitation on exposure to product liability risk. For example, producers should determine whether they are growing high risk produce (e.g. fresh produce that is highly susceptible to contamination), and compare their expected profits with and without product liability insurance to a scenario where there is a loss associated with a lawsuit for illness or death caused by contaminated products originating on their farm.

The low to moderate level of understanding of insurance policies reported by product liability insurance users, coupled with the number of producers who do not use product liability insurance because they do not have enough information about it, suggests an opportunity for University Extension and insurance companies to provide information to specialty crop farmers about product liability risk and the purpose and cost of product liability insurance.

## References

- Aung, M. M., and Y. S. Chang. 2014. "Traceability in a Food Supply Chain: Safety and Quality Perspectives." *Food Control* 39:172-184.
- Boys, K. A. 2013. "Food Product Liability Insurance: Implications for the Marketing of Specialty Crops." *Choices* 28(4). [http://www.choicesmagazine.org/magazine/pdf/cmsarticle\\_338.pdf](http://www.choicesmagazine.org/magazine/pdf/cmsarticle_338.pdf). [accessed June 23, 2015].
- Buzby, J. C., and T. Roberts. 2009. "The Economics of Enteric Infections: Human Foodborne Disease Costs." *Gastroenterology* 136(6):1851-1862.
- Connally, E. H. 2009. "Good Food Safety Practices: Managing Risks to Reduce or Avoid Legal Liability." Food Safety and Technology. FST-32, University of Hawaii, College of Agriculture and Human Resources.
- Cook, R. L. 2011. "Fundamental Forces Affecting U.S. Fresh Produce Growers and Marketers." *Choices* 26(4). [http://www.choicesmagazine.org/magazine/pdf/cmsarticle\\_202.pdf](http://www.choicesmagazine.org/magazine/pdf/cmsarticle_202.pdf). [accessed May 5, 2015].
- DeWaal, S., N. Fischer, M. Glassman, A. Coronaton, and E. Martinez. 2015. "All Over The Map: A 10-Year Review of State Outbreak Reporting." Center for Science in the Public Interest, June. <http://cspinet.org/reports/all-over-the-map-report-2015.pdf>. [accessed June 26, 2015].
- Goetz, G. 2012. "Farm Linked to Cantaloupe Outbreak is Likely Source of One, Possibly Two More Outbreaks." *Food Safety News*. <http://www.foodsafetynews.com/2012/09/farm-linked-to-cantaloupe-outbreak-is-likely-source-of-1-and-maybe-2-more-outbreaks/#.VaVPXPIVhHw>. [accessed July 14, 2015].
- Grossman, E. 2015. "What a Massive Spinach Recall Teaches Us About Food Safety." *Time*, April 7, 2015. <http://time.com/3774505/food-safety-spinach-recall>. [accessed June 23, 2015].

- Henson, S., and N.H. Hooker. 2001. "Private Sector Management of Food Safety: Public Regulation and the Role of Private Controls." *International Food and Agribusiness Management Review* 4:7-17.
- Hoffmann, S., B. Macculloch, and M. Batz. 2015. *Economic Burden of Major Foodborne Illnesses Acquired in the United States*. Washington, DC: U.S. Department of Agriculture, Economic Information Bulletin 140, Economic Research Service. <http://www.ers.usda.gov/media/1837791/eib140.pdf>. [accessed February 16, 2016].
- Mahdu, O. 2015. "Penalties for Foodborne Illness: Jury Decisions and Awards in Food Illness Lawsuits." MS thesis, Virginia Polytechnic Institute and State University.
- Palma, M.A., L.A. Ribera, M. Paggi, and R. Knutson. 2010. "Food Safety Standards for the U.S. Fresh Produce Industry." *Policy Issues* 18:1-6. <http://ageconsearch.umn.edu/bitstream/93684/2/Issue%208.pdf>. [accessed March 10, 2015].
- Spilker, L. Campbell Risk Management, Insurance Agent. Personal Communication. September 30, 2015.
- U.S. Department of Agriculture, National Agricultural Statistics Service. 2012. *Agricultural Statistics 2012*. Washington DC. [https://www.nass.usda.gov/Publications/Ag\\_Statistics/2012/2012\\_Ag\\_Stat.pdf](https://www.nass.usda.gov/Publications/Ag_Statistics/2012/2012_Ag_Stat.pdf). [accessed March 1, 2016].
- U.S. Food and Drug Administration. 2011. *FDA Food Safety Modernization Act*. Washington, DC, January. <http://www.fda.gov/Food/GuidanceRegulation/FSMA/default.htm>. [accessed December 8, 2014].