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Cover Page Footnote

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Farmers Markets and Single-Use Plastic: Why Environmentally Conscious Consumers Don't Bring Reusable Bags

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Abstract. This study looks at the role of Extension in helping local officials reduce plastic bag use at farmers markets in three Lake County, OH communities. We distributed free reusable bags to shoppers and conducted an education and outreach program. We then took observations to determine if the free reusable bags were being used. We also invited shoppers to take a voluntary survey about their environmental attitudes, why or why not they use the reusable bags, and how best to reduce plastic bag use moving forward. Results from the study suggest that supplying free reusable bags at farmer markets is not an effective strategy for Extension professionals attempting to reduce plastic bag use. Instead, we recommend working with local officials to develop financial incentives and disincentives tied to the type of bag option shoppers use, implement plastic bag bans at markets, and conduct locally-focused education and outreach. Although shoppers' environmental literacy and desire for sustainability is high, it is shown that behavior change is unlikely to occur without financial or policy incentives.

INTRODUCTION

Single-use plastic bags have become ubiquitous in modern society. While they provide consumers with a cheap and convenient way to transport agricultural and other goods, they have negative impacts on the environment when not disposed of properly (Derraik, 2002; Teuten, et al., 2009; Thompson et al., 2009). Plastic bags are also a growing problem for communities' waste management and recycling facilities, where they can clog equipment and are costly to manage (Elejalde-Ruiz, 2015). Even when properly discarded, bags can make their way into the environment where they impact natural resources and affect wildlife health (Thompson et al., 2009). Evidence suggests it is time to rethink our relationship with plastic bags.

One venue in particular where the use of plastic bags has come into question is farmers markets (Mao, 2011; McEachern et al., 2010). Farmers markets have grown in prominence in response to consumer preference for locally grown products (Darby et al., 2008). They also support community-based agriculture and economic development (Oberholtzer & Grow, 2003), two hallmarks of Cooperative Extension. However, even in progressive states such as California that have passed statewide bans on single use plastic bags, farmers markets, restaurants, and some retail stores are often exempt (Garza, 2017). Taken together with growing consumer demand for farmers markets to operate in a sustainable fashion (Davide et al., 2013), applied research is needed to inform programming that reduces plastic bag use at markets and promotes reusable bags and other carrier options.

This study looks at the role of Extension in helping local officials reduce plastic bag use at three farmers markets in Lake County, Ohio. We partnered with the Lake County Solid Waste District to attend the markets and distribute free custom reusable shopping bags made from 100% recycled plastic bottles and emblazoned with the Lake County Solid Waste District (SWD) logo printed on the side (from here forward referred to as Solid Waste Bags, or SWBs). We occupied a booth at the markets and educated shoppers about plastic pollution and the benefits of using reusable bags. We also took observations at the markets to determine if the SWBs were being used after dissemination and, if not, what people were using instead to carry their goods. Finally, we distributed follow up surveys to shoppers to explore their environmental attitudes, why or why not they use their reusable bags, and how best to reduce plastic bag use moving forward.

We hope this project helps inform a growing number of local approaches to reducing plastic bags across Ohio and

elsewhere. For example, Lake County's neighbor, Cuyahoga County, passed a county-wide bag ban in January 2020 (Sea Grant Law Center, 2020). Impacts from the ban were short lived, however, due to the COVID-19 pandemic. State officials halted the use of reusable bags from March 2020–August 2020 to mitigate the potential spread of the virus. The Ohio governor also prohibited enforcement of all local plastic bag bans until January 2021 (State of Ohio H. B. 242, 2021). Now that reusable bags are again permitted and the prohibition on local bans has expired, plastic bag reduction efforts at farmers markets and other retail outlets can resume in earnest.

Results from this study suggest that supplying free reusable bags at farmer markets is not effective for reducing plastic bag use. Instead, we recommend working with local officials to develop financial incentives and disincentives tied to the type of bag option shoppers use, implement plastic bag bans at markets, and conduct locally-focused education and outreach.

CONCEPTUAL BACKGROUND

Berkeley, CA, was the first farmers market in the nation to ban plastic bags in 2009 (Bhattacharjee, 2009). In the decade since, there has been much research on the sustainability of farmers markets, including the efficacy of farmers markets as sustainable local food systems (Feagan et al., 2011) and consumer attitudes about sustainability at farmers markets (Davide et al., 2013; Giampietri et al., 2016). Others have explored the economic sustainability of farmers markets (Cornell & Hergesheimer, 2014). Recent projects have focused on the ability of farmers markets to address social justice concerns in urban neighborhoods (Alkon, 2008) and bring wellness benefits to host communities (Abel et al., 1999; Parsons & Morales, 2013).

Recent research has begun to look specifically at the sustainability of using plastic bags at farmers markets. McEachern et al. (2010) explored the marketing of local foodstuff at farmers markets to "conscious consumers," finding that some consumers avoid using plastic bags for environmental reasons and instead prefer reusable alternatives. Some studies have focused on the responsibility of retailers to restrict plastic bag use and promote sustainable options (Mao, 2011). Others have considered drawbacks to banning plastic like the possibility of food contamination when using reusable bags and impacts on public health (Boyer & Pollard, 2017).

Behavior change analyses have detailed the barriers and benefits to reducing plastic bags from an applied perspective, suggesting that shoppers in northeast Ohio have access to free reusable bags but often leave them at home or in the car. Instead, outright bans and financial incentives are seen as more effective, especially when coupled with location-specific education and outreach (Bartolotta & Hardy, 2018). Others have agreed that "nudges," such as rebates and levies, can be effective strategies to reduce reliance on single-use plastics (Rivers et al., 2017; Sharp et al., 2010). According to Rivers et al. (2017), "these levies are typically small and symbolic (around $0.05 per bag), but serve as a highly-visible and continuous reminder to consumers" (p. 153).

While findings from these studies are helpful, more data is needed to inform the role of Extension in reducing plastic bag use at farmers markets, to understand the local context around bag use, and to identify tools for reducing shoppers' use of and access to single-use plastic bags. This project fills this gap by investigating and recommending strategies Extension Educators and local partners can employ in their communities.

METHODS

We acquired data for this project through: (1) participant observation and (2) an online survey. Subjects included shoppers at three Lake County, OH farmers markets in the cities of Mentor, Painesville, and Willoughby. Lake County, OH is an important research site because it is bordered by Lake Erie, the 13th largest fresh water lake in the world with approximately 30 miles of shoreline in the county, which provides drinking water for 11 million of the county's residents (EPA, 2004). Plastic marine debris (including bags) poses a threat to Lake Erie water quality and wildlife.

We used participant observation to tally the total number of SWBs used by shoppers and to determine trends in bag use at each of the farmers markets. Data collection included manually coding data on spreadsheets detailing the type of bags people used (plastic bag, paper bag, reusable bag, box, no bag, and no purchase) while at the markets. Patrons were required to be carrying items in bags or boxes or in hand to be counted as having made a purchase; otherwise, we coded them as "no purchase." To determine usage of SWBs, we counted each time someone was observed leaving the markets with items in a SWB. In order to establish trends in bag use, we noted bag use for a random sample of one-fifth of people leaving the market (every fifth person). After each market observation, we transcribed the field notes into an Excel spreadsheet for analysis.

We conducted a total of 40 hours of observation during 15 individual farmers markets at the three study sites. The observations occurred between May 25, 2019 and August 30, 2019. Each observation session lasted between two and four hours and took place during scheduled market times (8am–12pm for Willoughby; 12pm–4pm for Painesville; and 2pm–6pm for Mentor). Due to extreme weather events, the number of observations at the three study sites were uneven. Severe thunderstorms forced two of six scheduled farmers markets in Painesville to cancel, as well as one of six markets

in Mentor. We were able to observe all six scheduled markets in Willoughby.

We also occupied a booth with the Lake County Solid Waste District to educate the public about reusable alternatives to plastic carrier bags, to share information about recycling options for varying plastics, and to help distribute the free SWBs to interested shoppers. We only asked individuals who accepted a SWB and indicated a willingness to participate in a voluntary study to provide their email address so we could survey them about the project at the end of the season (1–2 months after they interacted with us at the market).

The online survey used Ohio State University's Qualtrics platform and went live on September 10, 2019. The survey contained 23 yes/no, multiple-choice, and Likert scale questions that sought to determine if and why people use plastic bags, measure public environmental literacy and understanding about the effect of plastic on the environment, and gather information about consumer choice and the impact sustainability has on shoppers' decisions regarding where to impose their purchase power. The survey followed standard social science protocols for the creation and testing of the survey instrument and for the identification of the study population and sampling frame (Dillman, 2007).

RESULTS

OBSERVATION

A total of 3,943 customers attended the farmers markets during our observations (see Table 1). We talked to 1,671 patrons about the project and gave out 1,325 free SWBs to shoppers but only observed 238 of them in use throughout the season. We conducted observations at seven markets when the free SWBs were being given out and nine markets when free SWBs were not being given out. We did not give out bags after July 19, 2019 because the allotment of 1,325 bags purchased for this project ran out. Of the 238 SWBs observed being used throughout the season, 188 were used on days when we were giving out the free bags, and only 50 were used on days when we were not giving out the free bags, despite two more observation sessions.

In addition to SWBs, we made observations about all options shoppers used to carry goods from the markets (plastic bags, paper bags, reusable bags, SWBs, boxes, no bags, and no purchase). All three study sites displayed a similar pattern with a primary reliance on plastic bags, followed by personal reusable bags, SWBs, no bags, and boxes. Data on individual farmers market bag use is reported in Table 2.

SURVEY

A total of 64 individuals signed up to take the survey, with 37 finishing. The ages of participants ranged from 25 to 74, with 72% of respondents identifying as female (see Table 3). Participants reported education levels from high school to Doctoral degree, with most having "some college" experience or a four-year degree. Average household income levels ranged from less than $25,000 to more than $135,000, with the majority reporting earnings between $45,000 and $75,000 per year.

Table 1. Project Summary Data

	Total market count	People engaged	SWBs distributed	SWBs observed	Survey signups
Willoughby (6 observations)	1,966	796	500	62	48
Painesville (4 observations)	1,010	441	300	75	7
Mentor (5 observations)	967	434	525	101	9
Total	3,943	1,671	1,325	238	64

Table 2. Trends in Bag Use at Farmers Markets

	Plastic bags	Paper bags	Reusable bags	SWBs	Boxes	No Bags	No Purchase
Willoughby	293	33	137	62	29	34	80
Painesville	184	6	61	75	1	9	15
Mentor	203	7	48	101	2	11	10
Total	680 (49%)	46 (3%)	246 (18%)	238 (17%)	32 (2%)	54 (4%)	105 (7%)

Table 3. Sociodemographic Variables

Variable	N	%
Age		
25–34	6	16.67%
35–44	8	22.22%
45–54	4	11.11%
55–64	8	22.22%
65–74	9	25.00%
Gender		
Female	26	72.22%
Male	9	25.00%
Education		
High school or GED	2	5.56%
Some college	9	25%
2-year college degree	4	11.11%
4-year college degree	13	36.11%
Master's degree	6	16.67%
Doctoral degree	1	2.78%
Average household income level		
Less than $24,999	2	5.56%
$25,000–$44,000	5	13.89%
$45,000–$54,000	7	19.44%
$55,000–$74,999	7	19.44%
$75,000–$94,999	2	5.56%
$95,000 or more	11	30.56%

The survey first sought to measure environmental attitudes, knowledge about plastic pollution, and familiarity with the effects of plastic pollution on the environment. When asked how environmentally friendly shoppers considered themselves, over three quarters of respondents indicated that they are either moderately or very environmentally friendly (see Figure 1). An even greater percentage of shoppers said that they are either moderately or very aware of the amount of plastic pollution in waterways, as well as moderately or very familiar with the effects of plastic pollution on wildlife, human health, and water quality.

Survey questions next addressed access to reusable bags and overall preference of bag options. When asked if shoppers have access to reusable bags, 97% of respondents said yes. We then asked how many reusable bags they own (see Figure 2) and, for respondents who do own reusable bags, how often they use them (see Figure 3). A follow-up question asked what factors contribute to shoppers not always using their reusable bags (see Figure 4).

We also asked shoppers how often they used their SWBs at other locations. For example, when asked how many times they used the SWBs at markets other than the market where the bags were obtained, over a third said never (see Figure 5). Almost another third said they only used the bags a few times. Conversely, the final third of respondents said they used the SWBs four or more times. Shoppers used the SWBs instead of plastic bags at stores other than farmers markets at a similar rate.

Almost all shoppers said it is either moderately or very important for businesses to take action to make less of a negative impact on the environment (see Figure 6). Moreover, the majority of shoppers said they are either moderately or very likely to support a business that will charge for disposable plastic bags rather than offering them for free. Almost all shoppers said that they are moderately or very likely to support a business that no longer offers any disposable plastic bags.

DISCUSSION AND CONCLUSIONS

Extension professionals have a stake in the growth and sustainability of farmers markets (Abel et al., 1999). Better understanding vendors' and consumers' preferences for how farmers markets operate (Govindasamy et al., 2002), especially how local food systems and their modes of production impact the environment (Ruth-McSwain, 2012), can help support community-based agriculture and economic development. One area where applied research can inform programming is with efforts to reduce reliance on plastic bags at markets.

Findings from this study indicate that giving away free reusable bags does not decrease plastic bag use at farmers markets. Instead, following guidance from survey respondents in this study and results from related research (Bartolotta & Hardy, 2018; Rivers et al., 2017; Sharp et al., 2010), we recommend partnering with community officials to develop financial incentives and disincentives tied to the type of bag options shoppers use, implement plastic bag bans at farmers markets, and conduct education and outreach programs.

Although impactful, there is an important limitation to consider with this study: the sample size of respondents who took the survey. Every person who received a free SWB was asked if they would take the voluntary survey. Out of 1,325 individuals, only 64 agreed to participate and gave valid email addresses, and of those, only 37 finished the survey. Given the low response rate, it is difficult to project survey trends to the general population of people who accepted free SWBs.

Despite this limitation, the present study enhances our understanding of the role Extension educators can play in reducing plastic bag use at farmers markets. We hope that the current research will stimulate further inquiry into the most effective strategies for reducing plastic pollution and promoting sustainable alternatives for carrying goods from farmers markets and other locations.

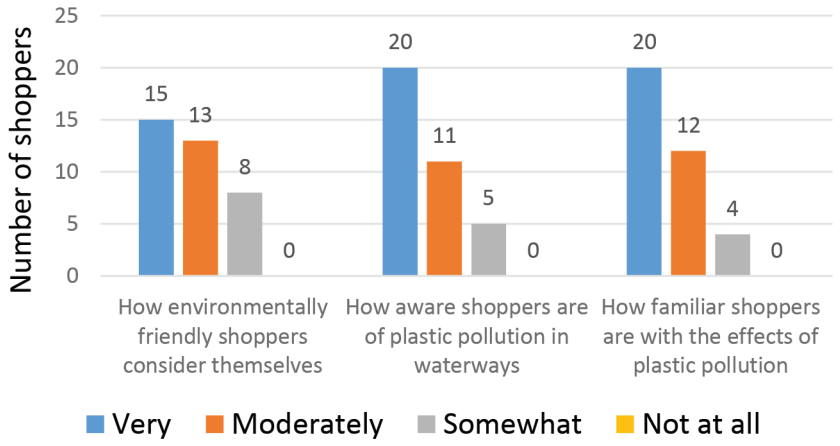

Figure 1. Environmental attitudes, knowledge about plastic pollution, and familiarity with the effects of plastic pollution on the environment.

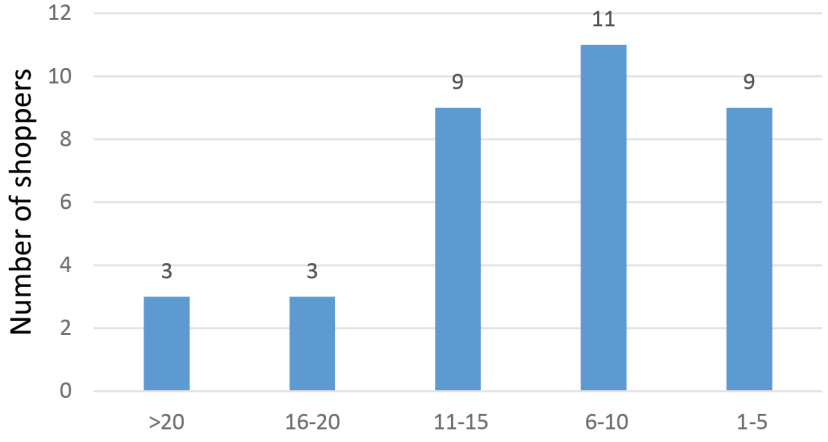

Figure 2. Number of reusable bags shoppers own.

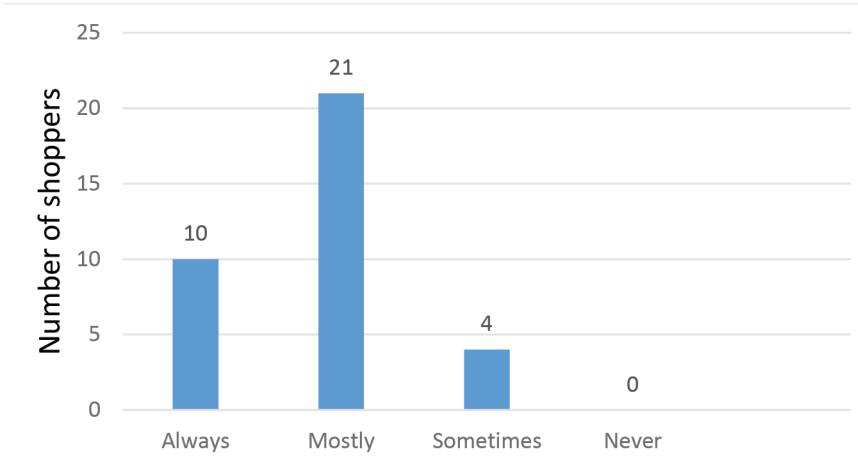

Figure 3. How frequently shoppers use their reusable bags.

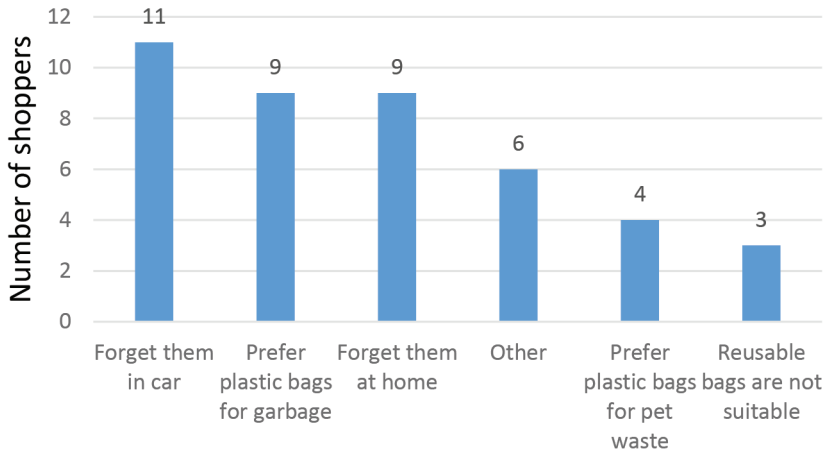

Figure 4. Reasons why shoppers don't use their reusable bags.

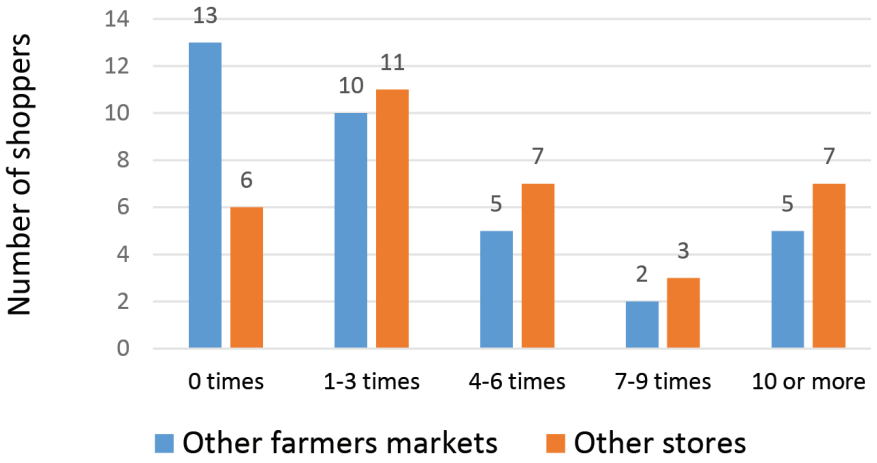

Figure 5. SWB usage at other locations.

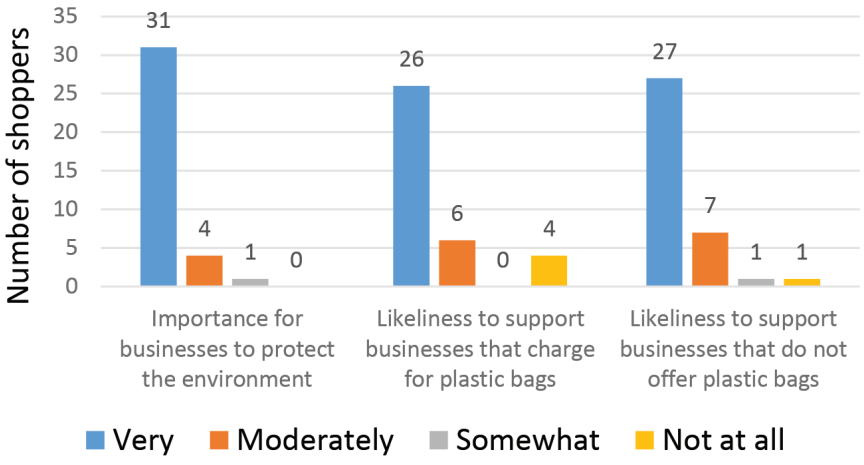

Figure 6. Support for actions that reduce impact on the environment.

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