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PRODUCE FARM-TO-MARKET TRENDS: A CASE STUDY OF SOUTH PUGET SOUND

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Abstract

This study identifies and quantifies the opportunities for, and barriers to, increasing the availability of locally produced fruits and vegetables in the South Puget Sound region of western Washington State, particularly in the under-tapped retail and institutional food service markets.

A mixed-mode data collection approach combining online and mail surveys with in-person interviews was used to solicit input from produce farmers as well as retail and institutional food service buyers.

The South Puget Sound region is defined in this study as Mason, Lewis, and Thurston Counties, all of which are located along the dominant transportation corridor connecting the Portland-Vancouver-Hillsboro and Seattle-Tacoma-Bremerton metropolitan areas.

Executive Summary

- Responding produce farmers in the South Puget Sound region harvested an average of 14 acres of fruits and vegetables from 29 acres of farmland in 2012, and two-thirds of these farms fit the USDA definition of a small farm, which is one that produces and sells between $1,000 and $250,000 per year in agricultural products (USDA-NASS 1998).
- The largest percentage of farmer respondents (74%) and buyer respondents (57%) defined *local* as being a product consumed either within 100 miles of the point of production or the county of origin. When asked what percentage of their produce they would like to sell locally, 87% of farmers responded 76% to 100% of their harvest.
- The majority of farmer respondents sold produce at farmers markets (88%), directly to retailers (88%), at farm stands (64%), and directly to restaurants or caterers (64%). Within the next three years, 39% and 41% of surveyed farmers expected to start up or expand direct sales to retailers and restaurants/caterers, respectively.
- Responding farmers were most comfortable marketing their products by word-of-mouth or through the Internet. Person-to-person communication and recommendation was a very effective method for 82% of responding farmers, while websites/blogs and social media were ranked second in effectiveness.
- Most retail and institutional food buyers did not know who the farmers were or how to contact them; thus, they have not been active in approaching farmers to develop business-to-business relationships.
- Access to and/or cost of farmland was most limiting to those produce farmers who operated larger farms and were most economically reliant on their farms. Thurston County farmers were more farmland-limited than farmers in the two other counties.
- Sixty-two percent of farmers requiring agricultural infrastructure identified cold storage as the greatest need. The primary demand for additional cold storage capacity came from Thurston County produce farmers.
- A majority of responding farmers (64%) would consider aggregating and/or jointly marketing their agricultural products with other farms in order to access markets. The sharing of machinery and equipment was of primary interest, while farmers were divided in their interest in sharing cold storage, with 44% of respondents being moderately to very interested, and 33% being not interested.

Introduction

Washington is the fifth largest vegetable-producing state by volume, accounting for 4.2% of the U.S. total (USDA-NASS 2013), and it accounts for about one-tenth of U.S. fruit-bearing acreage (USDA-ERS 2010). A recent analysis of major industry clusters in five counties of southwest Washington, including the three counties of interest to this study, found that crop production represents the largest volume of sales in the food production and processing sector, amounting to 11% of the sector total of just over $4 billion (PMWDC 2012).

The South Puget Sound region, which for the purposes of this study encompasses Mason, Lewis, and Thurston Counties, is situated along a route of strong consumer demand for local produce stretching from Seattle, Washington, to Portland, Oregon. Thus, many of the region's produce farms have developed direct-to-consumer marketing approaches, including sales through farmers markets, farm stands, and community-supported agriculture (CSA) programs.

There are nine farmers markets in the region with membership in the Washington State Farmers Market Association (WSFMA), including the Olympia Farmers Market, considered the second largest in the state.

The national growth in direct-to-consumer opportunities has been substantial in recent years. For instance, there was nearly a 50% increase in direct sales of food products from farmers to individual consumers between 2002 and 2007 (USDA-NASS 2007). The number of farmers markets in the U.S. grew from 5,000 in 2008 to 8,176 in 2014, a 64% increase.

Washington State currently has 158 farmers markets (USDA-AMS 2014), and between 1991 and 2012 the number of markets quintupled (Ostrom and Donovan 2013a).

The most recent data show that small farms (defined here as farms with less than $50,000 in gross annual sales) account for 81% of all farms reporting local food sales, and they are more likely than medium-sized and large farms to rely exclusively on direct-to-consumer marketing channels (Low and Vogel 2011). Despite these trends, only 1.5% of the dollars spent on fresh fruits and vegetables nationally changed hands at farmers markets and public markets.

Consumer purchasing of fresh produce takes place primarily at supermarkets and other retail outlets (56.6% of dollars spent annually), and at food service establishments (41.9%) (Cook 2011).

Strategic efforts to develop intermediated channels, such as farmers' sales to local institutions, grocery stores, and restaurants, have been gaining momentum in Washington because improved access to these dominant food markets can benefit the state's farms, supporting industries and rural communities while advancing public health goals.

A 2010 analysis identified a $7 billion opportunity gap between total food production and processing and total food consumption in Washington State. According to this analysis, satisfying just 2.5% of in-state food market growth with Washington-grown food would generate an additional 3,784 direct jobs and 3,076 indirect jobs (Crosby 2010).

One major strategic effort has been the Washington State Department of Agriculture (WSDA) Farm-to-School Program, which was established in 2008 by the Local Farms–Healthy Kids Act to support expanding economic opportunities for farmers while educating students about the connections between food, farming, health, and the environment. The WSDA's efforts have paid off, as the recently completed USDA Farm-to-School Census found that 104 school districts in Washington (47% of respondents) engage in farm-to school activities and spend 24% of their annual meal budget, or $10.5 million, on local food. Nationally, the average school district directs 14% of its annual meal budget towards the purchase of local food (USDA-FNS 2013).

A lack of affordable and appropriately scaled infrastructure is a serious hurdle preventing many farmers in western Washington from responding to strong consumer interest in buying locally produced foods (Embleton 2013). For instance, a farm-to-school study by the WSDA found that Washington's schools are challenged in procuring more Washington-grown food because of limited processing and distribution capacity (Elias, Kovacs, and Davis 2012).

A comprehensive assessment of gaps and opportunities in Washington's food system led by five state agencies concluded that there is a critical need to "support the development of small and medium-scale processing" and to "support the development of food hubs" (Washington Inter-Agency Working Group 2012).

The USDA defines a food hub as "a centrally located facility with a business management structure facilitating the aggregation, storage, processing, distribution, and/or marketing of locally/regionally produced food products."

Over the past few years, food-hub development has become a focus of several entities in western Washington as a means of providing small to mid-sized farms with improved access to institutional and retail markets, primarily in the Seattle metropolitan area. Perhaps most prominent is the Puget Sound Food Hub project of the Northwest Agriculture Business Center (Tuttle 2014).

These recent efforts to develop an agricultural infrastructure that most directly links farmer to consumer harken back to similar efforts undertaken in the region over three decades ago. In 1982, the Farm and Community Council was initiated in Thurston County, Washington, in part to organize a marketing cooperative for local farmers. The project received $45,000 in local public support over three years to launch the Farmers' Wholesale Cooperative (FWC), which became a farmer-owned leader in organic produce marketing and distribution centered in the southwest Washington region.

In inflation-adjusted dollars, gross annual sales of the FWC increased from $98,157 in 1983 to $2.6 million in 1986. The FWC purchased and operated its own 3,000-square-foot warehouse and cold storage facility outside of Olympia, Washington, and continued to expand until its dissolution in 1991. A cooperative approach to marketing and distribution allowed FWC-member farmers to increase their total area under cultivation from 15 acres in 1982 to 220 acres in 1985 (Stephen Buxbaum, unpublished data).

While direct-to-consumer opportunities in the South Puget Sound have grown in response to shifting consumer trends, it is unknown how marketing opportunities through regional wholesale channels have changed.

This research project was developed in response to a perceived opportunity for local fruit and vegetable farmers to introduce their products into regional retail and institutional markets, and for strategic public–private investment in critical agricultural infrastructure to improve these connections.

Research Methods

The primary concern of this study was: *What is needed to increase the availability of locally produced fruits and vegetables in the South Puget Sound region?* Through a series of surveys and interviews across Lewis, Mason, and Thurston Counties in Washington State, we aimed to identify opportunities as well as barriers to increasing local food production and consumption from two perspectives: that of the grower and that of the retail and institutional produce buyer.

We identified 74 commercial fruit and/or vegetable farms in the tri-county area through lists maintained by Washington State University (WSU) Extension and Conservation District county offices, Chambers of Commerce, farmers markets as well as from public farm directories (i.e., the Puget Sound Farm Guide, South of the Sound Farm Map, and the WSU Small Farms web directory).

We conducted the survey of the 74 farmers according to a modified Tailored Design Method (Dillman, Smyth, and Christian 2008), emphasizing transparent communication regarding the purpose and benefits of the study as well as personalization in participant communication through mixed modes of phone, email, and mail correspondence. The web-based questionnaire was developed and designed using SurveyMonkey, and it was pre-tested with eight food-system professionals and farmers external to the study's geographic focus area.

Phone and email contacts made over the week of January 21, 2013, introduced all of the farmers to the study and provided an opportunity for each to request a mailed survey with return postage, instead of a web-based survey. The web-based survey was conducted through email contacts made on February 7, 2013, and February 22, 2013. A reminder phone call was made to farmers who did not respond within these two weeks, and another offer was made to send a mailed survey with return postage if access to the Internet posed a challenge to recipients. The survey closed on March 29, 2013, with a 52.7% response rate (39 farmer respondents).

Following the survey, we selected 15 farmers to participate in one-on-one interviews, primarily on their respective farms, aiming for diversity in farm size, product mix, and geographic location. We also hosted a two-hour focus group attended by ten farmers from eight different farms.

In addition to receiving input from farmers, we surveyed and interviewed retail and institutional food buyers in the tri-county region. We identified a target survey population of 72 buyers who already sourced local produce or had expressed interest in sourcing local produce. This population was chosen based on the expert advice of the Washington Restaurant Association, local chefs and other food buyers as well as business development organizations.

The buyers included 41 restaurants, cafes, and caterers; 15 grocery stores, grocery cooperatives, and produce stands; and 16 hospitals, colleges and universities, and correctional facilities. The survey closed on August 28, 2013, with a 40.3% response rate (30 buyer respondents). Survey procedures were identical to those previously described. Building on the major themes that emerged in the survey, four buyers were interviewed in person.

Results

Farm Characteristics and Farmer Demographics

Consistent with statewide trends (Ostrom and Donovan 2013b), farms in the South Puget Sound region have been getting smaller both in terms of acreage and economic sales. Farmers responding to this survey in Lewis, Mason, and Thurston Counties harvested an average of 14 acres of fruits and vegetables from 29 acres of farmland. (These figures correct for an outlier farm that was 3,000 acres in size, which was 19 times larger than the next largest farm surveyed.) This 14-acre-per-farm figure is substantially smaller than the average vegetable harvest in 1997 of 44 acres per farm in the tri-county region (USDA-NASS 1997).

In terms of economic sales, two-thirds of the surveyed produce farms fit the USDA definition of a small farm, which is one that grows and sells between $1,000 and $250,000 per year in agricultural products (USDA-NCSF 1998). This contrasts with the USDA figure of 95%–97% of all farms in this region having per annum sales of less than $250,000 (USDA-NASS 2007).

Gross income from the sales of agricultural products ranged dramatically among farmer respondents. Forty-three percent of farmers earned less than $10,000 in cash receipts, and the same percentage earned $100,000 or more, so the number of farmers earning no more than a quarter of their total household income from the farm was nearly identical to the number earning three-quarters or more of their income from the farm. Thus, the typical produce-farm household in the South Puget Sound was as likely to rely primarily on off-farm income as it was to rely almost entirely on farm income.

Table 1. Characteristics of survey respondents in Lewis, Mason, and Thurston Counties in Washington State.[1]

Characteristic	Lewis Co.	Mason Co.	Thurston Co.	Tri-County Region
Number of farms (#)	7	6	25	39
Size of total farming operation (total ac)	250	3,108	686	4,104
Size of fruit and/or vegetable production (total ac)	62	109	352	549
Total farm receipts [total # of farms (% of total)]				
Less than $10,000	2 (13%)	4 (27%)	9 (60%)	15 (100%)
$10,000–$49,999	2 (40%)	1 (20%)	2 (40%)	5 (100%)
$100,000–$499,999	2 (22%)	0 (0%)	7 (78%)	9 (100%)
$500,000 or more	0 (0%)	1 (17%)	5 (83%)	6 (100%)
% of household income from farm operation [total # of farms (% of total)]				
0%–25%	2 (13%)	4 (25%)	10 (62%)	16 (100%)
26%–75%	2 (29%)	1 (14%)	4 (57%)	7 (100%)
76%–100%	2 (15%)	1 (8%)	10 (77%)	13 (100%)
% of total farm income by commodity (% per farm)				
Vegetables	54%	50%	57%	54%
Fruits and berries	3%	5%	24%	18%
Poultry, eggs, dairy, or beef	4%	9%	1%	3%
Other	39%	36%	18%	25%

[1]Data are shown by county and across all three counties.

While fruits and vegetables were undoubtedly the primary agricultural products of the surveyed farms, representing 72% of total farm cash receipts, many farmers were diversified beyond just produce. For example, 33% of respondents derived a portion of their farm income from meat or animal products, and 44% depended in part on sales of herbs, flowers, and nursery plants (Table 1). Responding farmers employed 456 people, 76% of whom were seasonal. On average, two family members and four unrelated persons worked full-time on the farm. Projecting from average survey employment figures, produce farms in the tri-county region employ 1,482 people annually.

The average produce farmer in the South Puget Sound region was younger than the average Washington State farmer: 50 years of age versus the state average of 57 years (USDA-NASS 2007). Also, there was a high percentage of first generation farmers (56% of respondents) in the region compared with those having three or more generations of farming experience within their family (31%). While a majority of the region's produce farmers do not come from multigenerational farming families, there was still a substantial amount of farming experience among them.

On average, current farms have been managed for 18 years by respondents who had an average of 26 years of overall farming experience. These demographic characteristics are due in part to a large number of students emerging from The Evergreen State College (TESC) agricultural education programs since the mid-1970s.

For instance, the owners of Burnt Ridge Nursery in Lewis County and Helsing Junction Farm in Thurston County, two well-established, diversified produce farms, were TESC graduates. These findings are also consistent with the changing demographics of farmers participating in direct-market and value-added activities across the U.S. (Bagi and Reeder 2012).

Produce farmers were queried about their maintenance of three types of farm plans (business, marketing, and farm safety) and four types of farm certification (organic, Salmon-Safe, biodynamic, and GAP or Good Agricultural Practices (Table 2). Half of respondents had a business plan, while slightly fewer had a marketing plan (37%) or a farm safety plan (37%). The inclination toward farm planning was such that 79% of respondents with a marketing plan and 71% with a farm safety plan also had a business plan.

Per annum, the average farm with a business plan harvested five more acres of produce and was 15% likelier to earn $100,000 or more in cash receipts than the average farm surveyed. Organic certification was over four times more common than Salmon-Safe certification, and only one respondent was GAP-certified. Eighty-five percent of organically certified farmers were first generation, 82% earned $100,000 or more in cash receipts, and 64% derived half or more of their household income from the farm.

Table 2. Survey respondent use of planning tools and certification programs.

Plan or Certification	% of Respondents	*N*
Business plan	50.0	19
Marketing plan	36.8	14
Farm safety plan	36.8	14
Organic certification	34.2	13
Biodynamic certification	0.0	0
Salmon-Safe certification	7.9	3
GAP certification	2.6	1
None of the above	21.1	8

Buyer Characteristics

Our survey asked for the responses of the primary decision-maker in charge of fruit and vegetable procurement at restaurants, grocery retail stores, caterers as well as the food services at colleges, hospitals, and correctional facilities. Of the 30 responses we received, 73% of businesses were sole proprietorships, limited liability corporations and partnerships, 17% were corporations, 7% represented state agencies, and 3% were higher education culinary arts programs.

Titles of respondents included owner, manager, food service director, and chef. Respondents were 58% male and ranged in age from 26 to 67 years, with an average age of 46 years. Respondents worked an average of 12 years at their present company or institution with an average of 20 years in their industry in the Pacific Northwest region. Seventy-three percent of respondents were located in Thurston County, 17% were from Mason County, and 10% from Lewis County.

Buyers were asked to clarify their approaches to produce procurement. We asked what quantities of fruits and vegetables they purchase, with what frequency, and from which sources. Respondents typically ordered small units (90% ordered by the case/box or under) with a relatively high frequency (67% ordered daily or 2 to 3 days a week).

Buyers primarily fell into one of two categories according to their sourcing of produce: those who did not purchase directly from local farmers (38% of respondents), and those who purchased up to 25% of their produce directly from local farmers (48%).

Forty-three percent of buyers purchased half or more of their produce from a local distributor sourcing a mix of local and non-local foods, while 27% purchased half or more of their produce from a distributor sourcing primarily non-local foods. A large majority of buyers (87%) did not purchase produce directly from international sources, although anecdotal evidence suggests that many common distributors purchase produce from international sources, particularly during the winter season.

We assessed buyers' level of interest in different ordering and delivery methods. Three-quarters (76%) of buyers were interested to very interested in placing orders online, while 86% were interested to very interested in placing orders over the phone. However, it is difficult for most small to medium-sized farms to staff a phone-ordering system given financial limitations. Thus, in order for the region's farmers to more effectively access wholesale markets, it may make sense for them to share a sales and marketing system.

Buyers were very interested in a combined approach to produce delivery and preferred to have one truck deliver produce on behalf of multiple farms (4.35 average ranking on a scale from 1=*Not Interested* to 5=*Very Interested*) than having individual farmers deliver their produce (3.96 average ranking). Forty-one percent of buyers were not interested in picking up produce from a central location, so delivery capacity will be an important factor in the farmers accessing regional wholesale markets.

Buyers were asked to list the three fresh fruits and vegetables they purchase most frequently from any source. The most common answers were leafy greens and lettuces (59% of respondents), onions (48%), tomatoes (45%), and potatoes (34%). Buyers were also asked which locally grown or locally processed fruits and vegetables they currently purchase in some quantity, and the most common answers were roots and tubers other than potatoes, onions, and carrots (50% of respondents), leafy greens (48%), lettuce (46%), mushrooms (46%), berries (45%), potatoes (44%), and tree fruit (44%). The least common answers were tree nuts (19% of respondents), celery (25%), and melons (28%). Lastly, buyers were asked which locally grown or locally processed fruits and vegetables they would consider purchasing. The most common answers were tree nuts (81% of respondents), celery (75%), melons (72%), and peppers (69%).

What is Local Anyway?

In an open-ended question, we asked farmers and buyers: *How do you define local?* The results are presented in Table 3 as the percent of respondents who defined local as falling within one of six different geographic categories. While there is no universally accepted definition of *localness* with respect to food, a number of studies support a popular understanding of local food as being that which is produced within 100 miles of the consumer (Hartman Group 2008; Pirog and Rasmussen 2008).

Our study supports the prevalence of this definition, as the largest percentage of farmer respondents (37%) and buyer respondents (32%) defined local in this manner. Many of the surveyed produce farmers falling within the range of 20–100 acres rely on markets ranging from Portland, Oregon, to Seattle, Washington, which approximates a 100-mile radius around the study region.

As an example, the distance between Grand Mound-Rochester, Washington, a major farming area in south Thurston County, and Portland, Oregon, is 100 miles. Another commonly cited definition for local in this study was the county scale, and it is interesting to note that the two largest produce farmers defined local as county of origin or a 50-mile radius. Thus, farm size does not necessarily correlate with perception of local food in the South Puget Sound. When asked what percentage of their produce they would like to sell locally, 87% of farmers responded 76%–100% of their harvest, and only 5% did not want to sell any produce locally. Thus, however local is defined, a majority of the region's farmers would like to connect with their local markets.

Table 3. Percentage of farmer and buyer respondents who defined local as one of six different geo-graphic categories.[1]

Definition of Local	% of Farmers	% of Buyers
Within the Pacific Northwest region	5	18
Within Washington State	8	18
Within a 200-mile radius	8	7
Within a 100-mile radius	37	32
Within the county	37	25

[1]Data are presented in descending order from broadest to narrowest scale.

Approaches to Produce Marketing

Farmers were presented with a list of eleven marketing outlets and asked to rate how frequently they sell their agricultural products through each on a 1=*Never* to 5=*Always* response scale. The majority of surveyed farmers sold produce with some frequency at farmers markets (88% of respondents), directly to retailers (88%), at farm stands (64%), and directly to restaurants or caterers (64%).

All other marketing outlets were used by half or fewer than half of the farmers. In order of average ranking, the five most important marketing outlets were farmers markets (3.49), farm stands (2.92), direct to retail markets (2.89), subscription shares or CSAs (2.60), and direct to restaurants and caterers (2.57).

Farmers markets, farm stands, and CSAs are attractive marketing outlets because they allow farmers to sell a wider variety of produce, in smaller volumes, to the consumer at a higher profit margin. A downside is the medium to high level of marketing time required of the farmer (Taber 2009).

Surveyed farmers were assuming growth in the consumer demand for local produce, as 43%–51% of respondents reported that they will either be expanding or starting up these three direct-to-consumer marketing outlets within the next three years (Table 4). Similarly, growth in direct sales to retailers and restaurants/caterers is expected for 39%–41% of the respondents.

Table 4. Farmers' planned growth in sales (expansion of start-up) to different marketing outlets.[1]

Marketing Outlets	% of Respondents	*N*
Farm stand	51.3	19
Farmers market	48.6	18
Subscription shares or CSA	42.8	15
Direct to restaurant or caterer	40.5	15
Direct to retail market (grocery, co-ops)	38.9	14
Pick your own	35.3	12
Wholesale distributor accounts	20.0	7
Farmer co-op or marketing association	17.7	6
Processor	11.7	4
Shipper/packer	0.0	0

[1]Data reflect a three-year period from 2013–2016.

On average, the traditional wholesale system of marketing was of lesser utility to the region's farmers than the direct-marketing approaches just described. The five least important marketing outlets were shippers/packers (1.20), farmer co-op or marketing associations (1.38), processors (1.56), online marketplaces (1.80), and wholesale distributors (1.84). There was no planned increase in sales to shippers/packers, and only 12%–20% of respondents reported that they will launch or expand sales to wholesale distributors, farmer co-op or marketing associations, and processors in the near future.

Only 14% of respondents often or always used an online marketplace. This is a surprisingly low number given the recent growth in online marketplace and directory services (e.g., Ecotrust's FoodHub and LocalHarvest) as well as farm-focused sales and business management software tools (e.g., LocalOrbit and Local Food Marketplace). There is likely a need to promote awareness of these web-based tools to the region's farmers.

Farmers were presented with a list of 13 marketing tactics and asked to rate how effective they are for their operation on a 1=*Not Effective* to 5=*Very Effective* response scale (Table 5). Word-of-mouth was deemed as very effective by 82% of responding farmers, making it by far the most important method of advertising. Virtual marketing through email, websites/blogs, and social media was very effective for 29%–37% of respondents, and the first two methods tied for second in overall effectiveness.

Contrasting with the popularity of web advertising approaches, the more traditional outlets of newspapers as well as radio and TV were regarded as not effective to somewhat effective. In fact, the latter methods were not used by 78% of respondents.

However, during an interview, one Lewis County farmer mentioned that radio advertisements for the Chehalis Farmers Market had been very effective in improving opening day sales for most participating vendors, so there is still a place for more traditional advertising outlets.

According to the survey results, sales meetings were also an unpopular marketing approach, ranked second from the bottom. However, hosting or participating in special events was ranked third in overall effectiveness; thus, the success of the local farming sector could be improved by the production of on-farm dinners and celebratory food events.

Table 5. Perceived effectiveness of different marketing tactics to produce farmers.[1]

Marketing Tactic	Avg. Rating	*N*
Word-of-mouth	4.58	38
Website/blog	2.97	38
Email	2.97	37
Host or participate in special events	2.95	37
Listings in printed or web directories	2.82	38
Social media	2.74	38
Samples or demonstrations	2.47	38
Farm and road signs, billboards	2.24	38
Coupons/discounts	1.79	38
Paid newspaper advertising	1.03	38
Frequent buyer program	0.74	38
Sales meetings	0.68	38
Paid radio or TV advertising	0.57	37

[1]Responses were collected using a five-point scale from 1=*Not Effective* to 5=*Very Effective*.

Both farmers and buyers were asked how they established their current business relationships with one another. A surprising inconsistency was that while 67% of surveyed farmers secured sales because buyers requested their product, only 16%–21% of buyers (correcting for buyers who do not buy directly from farmers) stated that they initiated contact with farmers either by cold calling or emailing, or through a personal visit (Table 6).

As the interviews established that many farmers were selling directly to buyers as far away as Portland, Oregon, and Seattle, Washington, buyers in the tri-county region may not be as accustomed to directly approaching farmers as buyers are in the major urban markets.

This assumption is further supported by the fact that none of the buyers attended a farmer-buyer networking session, and only one buyer used an online marketplace or directory to establish contact with farmers. In contrast, 19% of responding farmers utilized both of those avenues to establish relationships with buyers.

Both farmers and buyers disclosed that personal contacts were a very important catalyst for the establishment of business relationships. Thus, trusted community leaders should continue to facilitate close working relationships between the two parties.

Table 6. Methods employed by produce farmers to establish their current relationships with buyers.

Method	% of Respondents	*N*
Buyer(s) requested your product	67	24
Through a personal contact	64	23
Personal visit to the buyer(s)	56	20
Cold call/email to the buyer(s)	28	10
By attending a producer-buyer networking session	19	7
Through an online marketplace and directory	19	7

The Challenges Farmers Face

Farmers were asked to judge how limiting 18 factors are to their operations on a scale from 1=*Not Limiting* to 5=*Very Limiting* (Table 7). These factors can be categorized as land and labor, markets, business services, agricultural inputs, equipment and infrastructure, regulations, and weather.

The five factors regarded as moderately to very limiting by the largest percentage of farmers were: availability and/or cost of labor (49% of respondents), regulations (49%), weather and/or drainage (45%), storage infrastructure (43%), and processing infrastructure (43%).

Running a profitable, diversified farm that is primarily reliant on direct marketing requires a workforce with a broad skill set and base of knowledge, from crop production to record-keeping, food safety, and customer service. It is difficult finding and retaining such a skilled workforce in a sector having highly seasonal work and limited salary and benefits. One South Sound farmer succinctly explained this during an interview: “That is one of the unique challenges–to get people in place that can provide the level of service that you need for the salary and the schedule that you’re able to provide. I find that enormously challenging.”

Table 7. Factors perceived by produce farmers to be limiting to their farming operations.[1]

Factor	Avg. Rating
Weather and/or drainage	3.26
Regulations	3.19
Availability and/or cost of labor	3.05
Storage infrastructure	3.00
Liability	3.00
Processing infrastructure	2.84
Availability and/or cost of land	2.76
Handling and packing infrastructure	2.69
Production equipment	2.62
Availability and/or cost of seed, fertilizers, pesticides, and other inputs	2.51
Delivery trucks	2.51
Restricted access to existing market outlets	2.21
Access to credit and/or financing	2.11
Limited market outlets	2.08
Access to marketing expertise	1.97
Access to accounting expertise	1.78
Access to legal consultation	1.47

[1]Responses were collected using a five-point scale from 1=*Not Limiting* to 5=*Very Limiting*.

Concerning the availability and/or cost of land, a majority of respondents fell into one of the following two groups: those for whom this was not limiting (45% of respondents) and those for whom this was very limiting (32%). Interestingly, respondents in the first and second groups were both on average second generation farmers having 27 years of overall farming experience.

The major differences between the two groups were reliance on farm income and location. The farmers who regarded land as very limiting harvested double the acreage of produce and were five times more likely to derive half or more of their total household income from the farm compared with those for whom land was not a limiting factor. Also, 91% of those respondents very limited by land were in Thurston County, compared with only 53% who were not limited by land.

This is undoubtedly due to the high cost of cropland. In 2013, Thurston County had the second highest average rental rate for irrigated cropland out of the nineteen western Washington counties. Thurston County's average rental rate was 4.9 times higher than Lewis County's rate, and 1.9 times higher than King County's rate (USDA-NASS 2014). Improving access to farmland suitable for the production of fruits and vegetables at a scale allowing for economic viability should be made a high priority for policymakers and support organizations in Thurston County.

Access to basic business services and market outlet availability were the least limiting factors to the region's produce farms. Dissecting these observations in greater detail, the five factors regarded as not limiting or slightly limiting by the largest percentage of farmers were, in descending order: access to legal consultation (86% of respondents), access to accounting expertise (76%), limited market outlets (71%), access to marketing expertise (69%), and access to credit and/or financing (68%).

A majority of surveyed farmers perceive there to be strong consumer demand, and by extension, sufficient market availability for their agricultural products, and they generally feel confident about their ability to translate advertising into sales. They feel that their bookkeeping and legal matters are in order and, for the most part, they are not desperate for financial capital.

Not being limited by credit and/or financing was not correlated with scale of production, years of farming experience, or location. However, 65% of this respondent class derived no more than one quarter of their household income from the farm. It follows that access to lenders was primarily a worry of farmers reliant on their farms for half or more of their household income.

Produce farmers were asked how they would finance an expansion of their operation if they had self-identified as expecting near-term growth. Only 36%–42% of those farmers expecting to expand their current operation would be interested in using loans or lines of credit toward this end. In comparison, 86% of farmers expecting to expand their current operation would be interested in using their annual income and cash flow, 53% in grants, and 50% in their savings. Thus, the region's produce farmers are cautious about borrowing money.

Farmers might perceive that either the scale of infrastructure investment outweighs the debt load they are willing or able to take on, or the infrastructure gaps should be filled by businesses separate from their farms. For example, processing could be perceived as a service that does not require a farmer's direct involvement, such as a manufacturer of fermented foods who might contract directly with local farmers for raw materials, but the processing itself is not carried out by those farmers. However, this study did not address farmer interest in value-added strategies.

Agricultural Infrastructure Needs of Farmers

Farmers were asked if they were currently in need of infrastructure to support handling, packing, storing, processing, transporting, and/or delivering their agricultural products. Respondents were split, with 51% of farmers answering that they have an infrastructure need, and 49% of farmers stating that they have no need.

Respondents requiring agricultural infrastructure identified cold storage as the greatest need (62% of this cohort). A relatively smaller percentage needed dry storage (38%), washing infrastructure (33%), packing infrastructure (33%), delivery capacity (33%), and processing infrastructure (24%).

Washing and packing infrastructure needs were tightly linked, with 86% of farmers requiring one also requiring the other. Only 38% of those farmers requiring cold storage also required dry storage. A majority (69%) of farmers needing additional cold storage capacity were located in Thurston County, and half of this cohort earned 76%–100% of their household income from the farm. This cohort expects to grow direct-to-consumer markets more aggressively within the next three years than the average respondent, as most respondents will be either expanding or starting up direct-to-retail (75%), CSAs (73%), direct-to-restaurants/caterers (69%), and farm stands (62%).

Cooperation among Farmers to Access Markets

Because the region's produce farms are getting smaller on average and availability of scale-appropriate agricultural infrastructure is lacking, we hypothesized that farmers would consider aggregating and/or jointly marketing their products with other farms to better access markets. Farmers were indeed willing to cooperate, with 64% of respondents being open to the possibility, while 36% were unwilling.

Asked to elaborate on their answers, many farmers discussed the potential benefit of a food-hub model, as this quote demonstrates: "If we team up with other growers, we can sell more easily to institutional buyers who require consistent quality and volume of supply." The language used by those farmers interested in cooperation ranged from the cautionary ("I think it would depend on the scenario") to enlivened ("I love this idea!!! I have heard folks ask this question for years and I have always said YES").

Farmers self-identifying as willing to cooperate with other farmers to access markets were presented with a list of 12 types of agricultural infrastructure and business services and asked to rate how interested they are in sharing or coordinating those items with other farms on a scale from 1=*Not Interested* to 5=*Very Interested* (Table 8). Average rankings ranged from 2.40 for grading or sorting equipment to 3.86 for agricultural machinery or equipment.

Sixty-two percent of farmers were moderately to very interested in sharing agricultural machinery or equipment, while only two respondents were not interested in this possibility. One Thurston County farmer elaborated on their experience with this type of sharing: "We farm … alongside several other small organic farms. We all band together to buy fertilizer, potato seed, and share equipment and expertise. It is invaluable!"

The five additional highest ranked items were marketing expertise (3.37), refrigerated delivery truck or van (3.11), food safety testing or analysis (3.05), cold storage (3.00), and dry storage (3.00). Farmers were divided in their interest in sharing cold storage, with 44% of respondents being moderately to very interested, and 33% being not interested. Those who were moderately to very interested in sharing cold storage were located only in Thurston County (57% of this cohort) and Mason County (43%), harvested slightly more produce than the average farm in the region (18 acres versus 14 acres), and had annual farm receipts either $250,000 or more, or less than $25,000.

Table 8. Farmer interest in sharing resources with other farmers.[1]

Resource	Avg. Rating
Agricultural machinery or equipment	3.86
Marketing expertise	3.37
Refrigerated delivery truck or van	3.11
Food safety analysis or testing	3.05
Storage, cold	3.00
Storage, dry	3.00
Processing equipment	2.95
Packaging	2.86
Billing and payment systems	2.82
Washing equipment	2.75
Grading or sorting equipment	2.40

[1]Responses were collected using a five-point scale from 1=*Not Interested* to 5=*Very Interested*.

The subject of interest in cooperation was further explored during the interview process. Three levels of cooperation emerged from the interviews: low risk, medium risk, and high risk.

1. Build the Social Network (Low Risk): Meet more regularly to share ideas and/or equipment and materials and get to know the regional food buyers better.
2. Better Use of What We Have (Medium Risk): Identify, upgrade/repair, and use existing infrastructure (e.g., granges, fairgrounds) as certified kitchens, storage, etc. In some cases this may mean coordinating efforts with neighboring farmers or those with similar needs.
3. Build New Infrastructure to Fill Gaps (High Risk): Develop new agricultural infrastructure both locally and regionally, keeping in mind that there are geographic constraints on a farm's ability to use particular types of infrastructure, often based on distance from their fields.

While many South Puget Sound produce farmers recognize benefits of cooperation, it seems unlikely that broad coordination across the region will emerge, beyond the neighborly sharing that already takes place, without an outside facilitator.

We see the value in continued engagement with farmers to assess and coordinate solutions for their collective needs, and ensure their participation in broader future planning around sustainability efforts and regionalizing the food system in the region. This could be new territory for WSU Extension specialists, economic development organizations, city and regional planners, and citizen food-system councils.

Conclusion

Paralleling developments in most urbanizing areas of the U.S., produce farms in the South Puget Sound region have been getting smaller in terms of both acreage and economic sales. Also, access to farmland, skilled labor, agricultural infrastructure, and business services has become severely limiting to farm operations. The close proximity of these South Puget Sound farms to major centers of local food demand has given rise to a produce marketing strategy almost wholly dependent on regional direct-to-consumer and intermediated channel sales (e.g., farm-to-institution and farm-to-retail).

The region's produce farmers expect to grow these marketing outlets in the near future, as they are primarily interested in selling to local markets. They are also interested in collaboration to better access existing markets, and buyers show considerable interest in being able to purchase from local farmers through a centralized or coordinated system.

Two primary opportunities to expand local fruit and vegetable production and consumption have surfaced from the survey results: (1) better utilization of existing infrastructure and development of critical, missing infrastructure, and (2) support for a local food-system coordinator position. Because cold storage was identified as the greatest need by South Puget Sound produce farmers, the authors recommend that development of shared cold storage and processing facilities be explored with willing produce farmers in tandem with economic development partners.

Additionally, because an interest in food hubs and other shared agricultural resources is emerging across western Washington State and was found to be of great interest to farmers who completed the survey, an effort should also be made to explore potential linkages between South Puget Sound efforts and those of the wider region. The authors recommend development of additional outreach to, and stronger connections between, the region's farmers and buyers.

This could take the shape of networking events between farmers and food buyers on an annual or semi-annual basis as well as increasing outreach and education to buyers regarding currently operating local farms and their product availability throughout the seasons, all of which could be part of the responsibilities of a food-system coordinator. This coordinator could also help address the persistent challenges to farmland access by facilitating dialogue among farmers, landowners, policymakers, and agricultural-support organizations.

This study focused on fruits and vegetables, but future efforts to assess collaboration potential should expand to include meat and other animal products, finfish and shellfish, grains and pulses as well as food processing. The turnout at the South Sound Farm-to-Fork event, which represented this range of agricultural products, demonstrated farmer capacity to produce and buyer interest to procure a wide variety of items from this region. This is a time of great opportunity for farmers and buyers—and ultimately consumers—as interest grows in locally sourced food.

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