



Innovators or Laggards?

Exploring The Adoption of Value-Added Technologies Among Beginning Farmers

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Consumers demand differentiated products

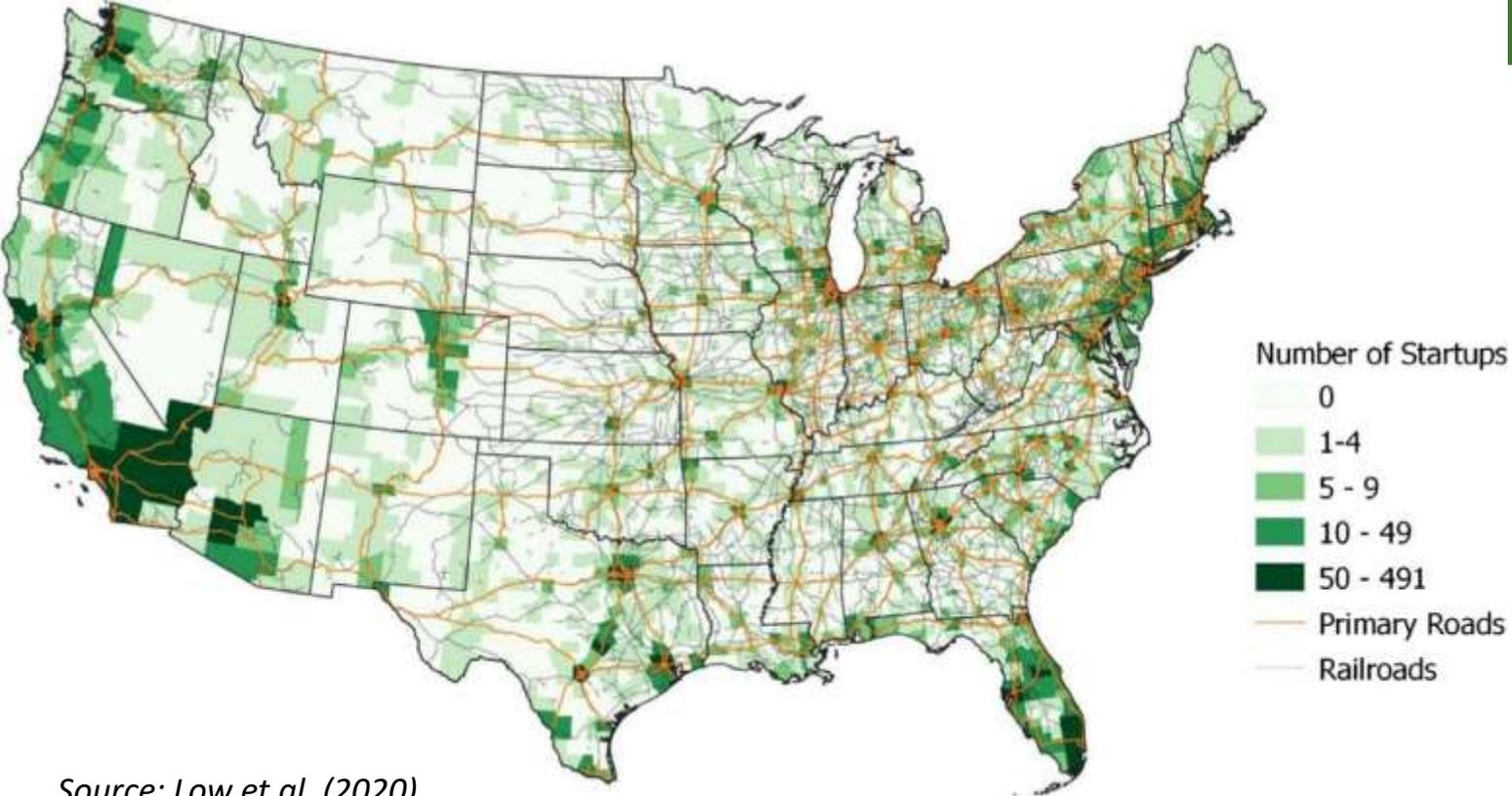
- Consumers have lost trust on commodified food production (Lusk and McCluskey, 2018)
- Increasing demand for values-based and place-based foods
 - A shift towards smaller and specialty-good manufacturing
 - Consumer food and beverage spending is stagnant
 - National food brands are integrating local labels (Thilmany et al., 2019)
 - Start-ups and artisan brands (O'Hara et al., 2020)
- Still, there is a sizable budget-conscious consumer (bifurcation of food supply chain)
 - High consolidation among food manufacturers and national brands

Values- and place-based food labels

- Labeling systems are getting better formulated across the agri-food supply chain
- **Origin:** local, state-specific, domestic
- **Production practices:** animal welfare, organic, chemical free
- **Nutrition and safety:** traceability, free-from *<dietary restriction>*

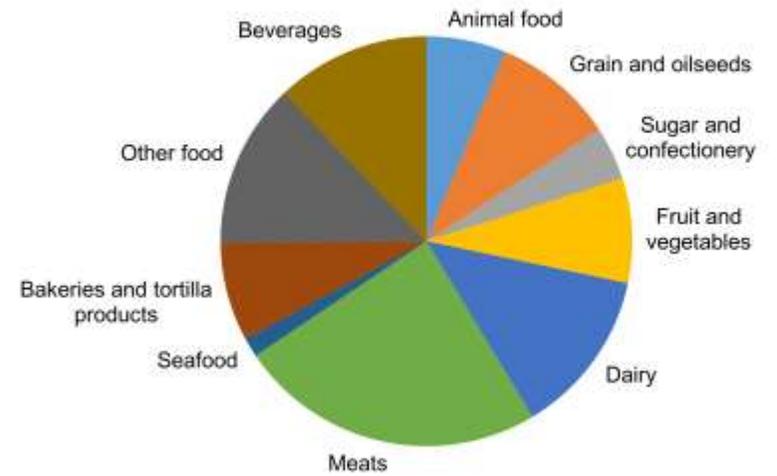
Value-added agriculture

- 33,523 farms sold over \$4 billion in value-added products (2017 Census of Ag)
- Food manufacturing is the largest subsector in rural manufacturing (Lambert and McNamara, 2009)
 - Small local businesses tend to improve local economic, job, and community resilience growth (Rupasingha, 2017; Low and Brown, 2017)
- Supply of value-added foods is correlated with food entrepreneurship in local food systems (Low et al., 2020)
 - More convenient presentation of agricultural products
- Value-added (VA) agriculture has been promoted as a strategy to support both rural development and agricultural entrepreneurship (Womach, 2005).
 - Regions where farmers implement VA practices have experienced sustainable economic growth through linkages developed between these farmers and other business (Monchuk, 2006)
 - Rural and small business development policies must be well informed (Lusk, 2017)



Source: Low et al. (2020)

**Components of food and beverage manufacturing:
Sales, value of shipments, or revenue by industry, 2018**
Meat processing is the largest single component of food and beverage manufacturing, with 24 percent of shipments in 2018



Source: Prepared by USDA, Economic Research Service, using data from U.S. Bureau of the Census, 2018 Annual Survey of Manufactures; data as of April 2020.

Beginning farmers and ranchers (BFR)

- In the 2017 Census of Agriculture: 674,940 BFR
 - 27% of producers
 - Average age 46.3 years
- BFR tend to face higher initial investment costs and risk and reduced availability of land when compared to their counterparts (Ahearn et al., 2009)
 - Costs of farming
 - Farming part-time
 - Smaller operations
- Credit constraints are associated with significantly lower production level (Griffing et al., 2020)
 - Improve access to loans
 - Expanding land purchase

- Most of the agricultural VA literature in the US has focused on the economic impact of adopting these technologies at the community level
 - VAPG towards VA increased the farm survival rate from 33% up to 74% after a 10-year period
 - Employment increased about 40% in farmers utilizing the VAPG
- As the succession and sustainability of US agriculture is threatened by the aging of the farmer population, understanding how beginning farmers are motivated (or not) to diversify and take on new technologies is crucial to support their success

Framework

- Push vs. Pull
 - Diversification strategy (push effect)
 - Response to local consumer demand (pull effect) (Low et al., 2020)
- Downstream diversification
 - Vertical diversification (add value)
 - Horizontal diversification (access markets)
- USDA Value-Added Producer Grant
 - \$37 million up to 2020
 - New products, increase off-season income, expand marketing opportunities, and improve overall sustainability
 - **Changes of:** physical state, production process, marketing and identity

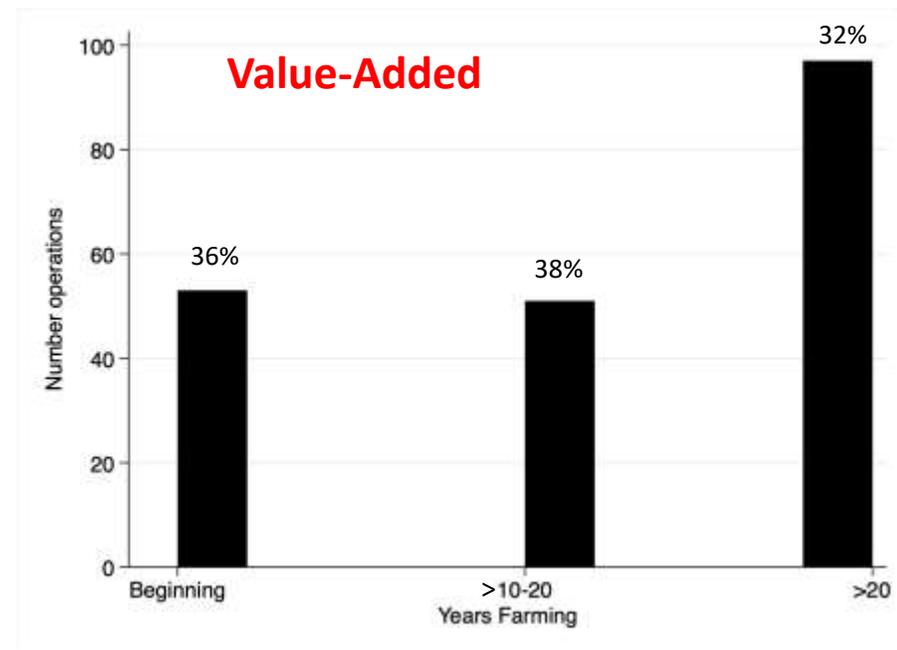
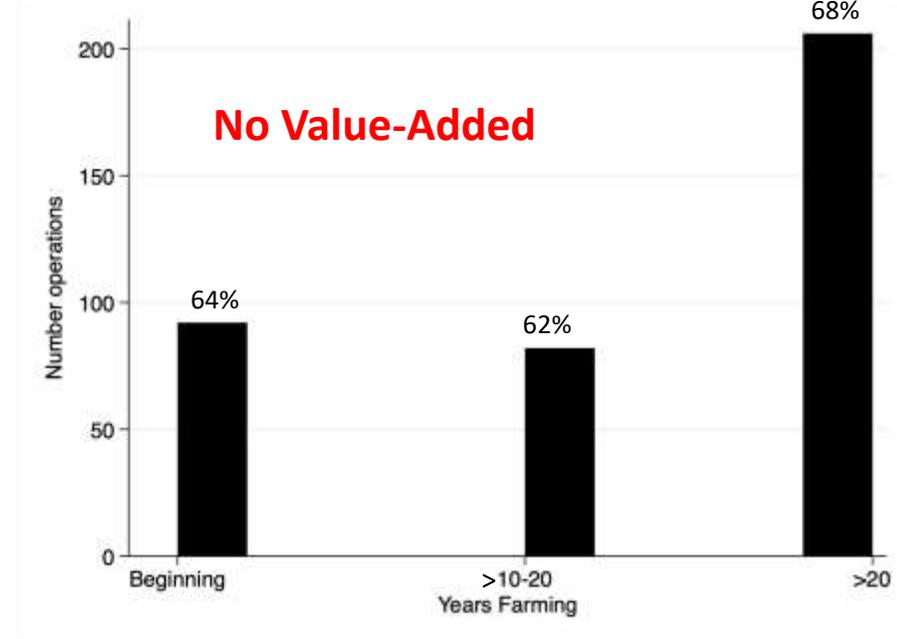
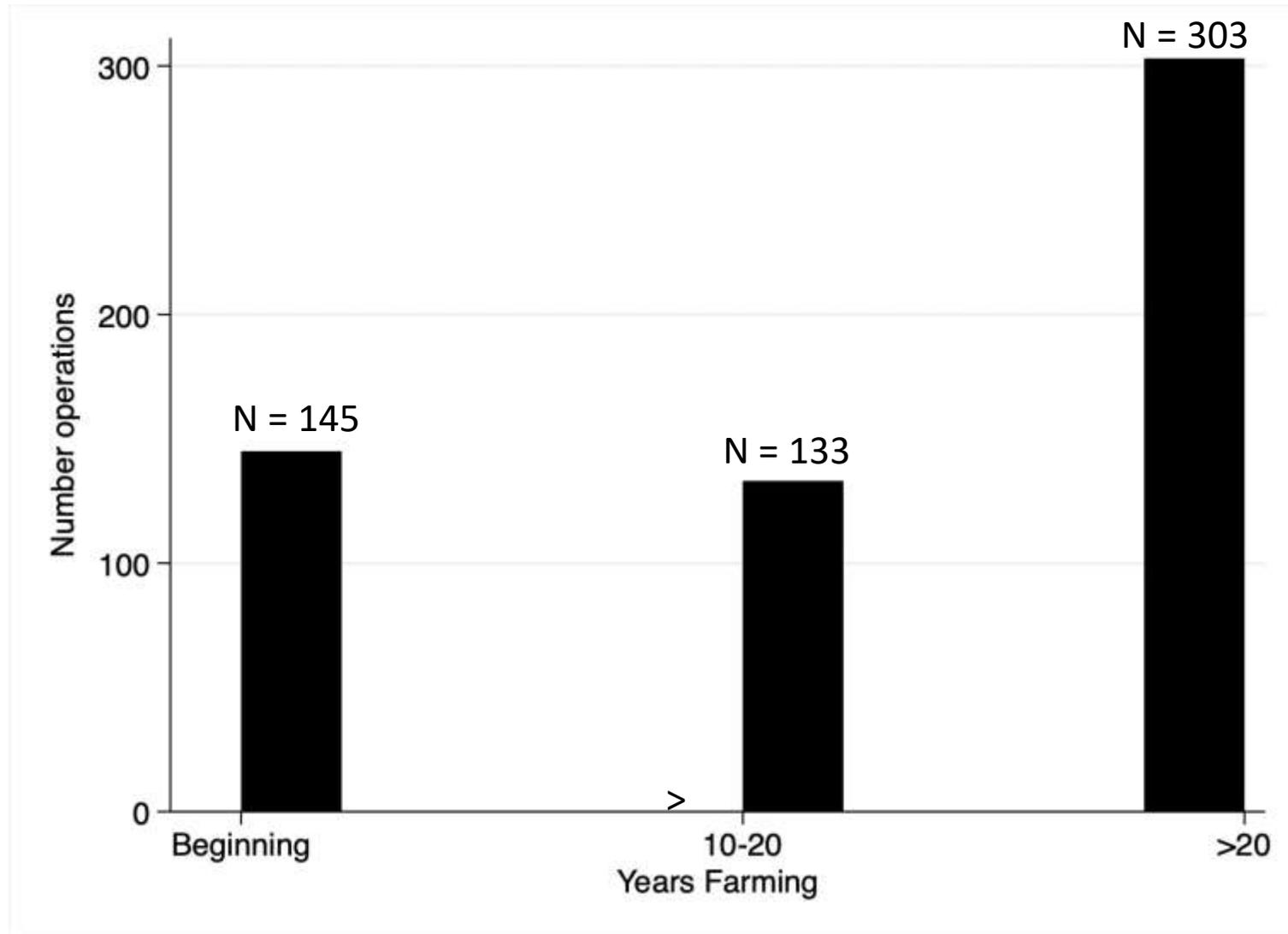
Goals

1. To characterize the beginning farmers in the specialty crops industry
2. To identify the adoption and diffusion of VA technologies among beginning farmers

Data & Methodology

- 2019 web-based survey of 766 farmers in 32 states
- Sample 581 farmers who self-reported years of farming experience
- VA practices included washing, cutting, and/or drying of specialty crops
- Methodology
 - **Means comparison:** ANOVA tells us the differences between beginning farmers and more experienced farmers
 - **Quantile regression:** How VA and VA experience influence beginning farmers compared with other farmers
 - **Probit regression:** Factors influencing beginning farmers

RESULTS



Means comparison (ANOVA)

Beginning farmers have:

- Less VA experience
- Less employees
- Smaller farms
- Part-time
- Less revenues
- Higher percentage of income comes from farm
- Rely less in networks
- Perceive the need to financial assistance to VA
- Increased sales from previous year
- Increase debt from previous year

	Beginning	>10-20 years	>20 years
Value Added	0.55	0.55	0.48
VA experienc	4.13 b	6.06 b	9.56 a
College	0.67	0.67	0.65
Female	0.37	0.36	0.29
Minority	0.05	0.08	0.05
South	0.19	0.17	0.19
West	0.20	0.28	0.25
North East	0.06	0.03	0.05
Wholesale	0.15	0.16	0.24
Mixed Mkt	0.38	0.32	0.28
Distance	20.51	18.26	21.73
Labels	0.53	0.43	0.45
Labor	10.57 b	15.65 ab	27.37 a
Land	147.12 b	203.92 ab	412.61 a
SoleProp	0.36	0.49	0.39
Part-time	0.40 a	0.38 a	0.26 b
Small	0.74 a	0.66 a	0.39 b
Medium	0.06 b	0.14 ab	0.15 a
Perc. Income	75.94 a	73.12 ab	66.05 b
Farm Tech	0.75	0.75	0.68
Generations	1.38	1.62	2.30
Networks	0.30 ab	0.34 a	0.22 b
Info Extension	0.86	0.76	0.85
Info Farmers	0.88	0.88	0.88
Successful	0.57	0.53	0.45
Financial Assis	0.62 a	0.56 ab	0.48 b
Mkt Reliable	0.41	0.39	0.35
Increase sales	0.46 a	0.36 ab	0.25 b
Increase debt	0.21 a	0.13 ab	0.12 b

Results: Quantile regression

Beginning farmers are positively correlated with:

- Experience adding value
- Female
- Generations
- Using information from Extension services

Beginning farmers are negatively correlated with:

- Adding value to specialty crops
- Feeling successful
- Finding markets reliable

	Beginning	>10-20 years	>20 years
Value Added	-5.60 **	0.92	-3.70
VA experience	0.54 ***	4.18 *	5.50 *
College	-2.28	2.98	0.88
Female	3.79 *	3.45	-2.75
Minority	3.64	0.66	-6.41 **
South	0.75	7.93	2.11
West	4.30 *	-0.04	-0.09
North East	2.05	-0.46	-0.19
N. Crops	-0.02	-3.71	-1.76
DTC mkt	1.33	-0.02	-0.02
Mixed mkt	-1.54	0.04	-1.59
Distance	0.00	-0.02	0.00
Labels	1.50	0.00	0.00
Labor	-0.02	4.24	3.77
Land	0.00	-2.19	-0.01
SoleProp	2.21	-8.88 **	-9.84 **
Part-time	-4.89 **	-4.37	-3.74
Small	-6.65 *	0.02	0.01
Medium	0.46	2.02	3.30
Perc. Income	0.00	3.83 ***	4.57 ***
Farm Tech	-0.76	-0.08	1.12
Generations	2.68 ***	1.40	1.47
Networks	0.41	-1.92	0.31
Info Extension	4.80 *	-3.18	-3.13
Info Farmers	-4.53	-2.98	0.33
Successful	-3.79 *	-2.83	-3.66
Financial Assistance	-2.79	1.30	-2.02
Mkt Reliable	-5.20 **	-5.20	-5.94
Increase sales	0.21	-6.96 **	-5.47
Increase debt	-3.06	0.45 ***	0.50 ***
Intercept	20.01 ***	22.27 ***	32.76 ***

Results: Probit regression

Beginning farmers are **positively** correlated with:

- Being small
- Increasing debt

Beginning farmers are **negatively** correlated with:

- Being sole proprietorships
- Having multiple generations farming

	Coefficient	Marginal Effect
Value Added	0.12	3.45
College	-0.02	-0.60
Female	-0.03	-0.91
Minority	-0.42	-12.34
South	-0.01	-0.22
West	-0.19	-5.59
North East	-0.02	-0.67
N. Crops	-0.01	-0.22
DTC mkt	0.03	0.97
Mixed mkt	0.32	9.34
Distance	0.00	0.07
Labels	0.05	1.55
Labor	0.00	-0.05
Land	0.00	0.00
SoleProp	-0.41	-11.88 ***
Part-time	0.29	8.40 *
Small	0.62	18.11 ***
Medium	-0.22	-6.28
Perc. Income	0.00	0.07
Farm Tech	0.01	0.27
Generations	-0.32	-9.30 ***
Networks	0.13	3.67
Info Extension	0.08	2.20
Info Farmers	-0.19	-5.51
Successful	0.05	1.32
Financial Assistance	0.21	6.07
Mkt Reliable	0.09	2.77
Increase sales	0.26	7.63
Increase debt	0.40	11.61 *
Intercept	-0.93	-
N. Obs		485
Prob>Chi2		0.00
R2		0.21

Thank you for your time

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