

Does the Name Matter?

Developing Markets for New Managed Apple Varieties

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Many new varieties in the tree fruit industry are so-called managed varieties. Such varieties are marketed by an organization that obtains an exclusive license on a patent held by a university or private breeder, and in turn agrees to pay royalties for the trees and annual fees on all fruit sold. Brown and Maloney (2009) highlighted some of the major organizations around the world that hold such licenses including the Association of International Group of Nurseries, Better3Fruits, and Varicom. Lehnert (2010a, 2010b) discussed the development of the Next Big Thing, a grower cooperative that has an exclusive license to produce and market the apple variety SweeTango developed by the plant breeding program at the University of Minnesota.

Developing and marketing new varieties is essential to sales and profit growth in U.S. fruit markets, and the ability to engage in intellectual property rights for these new varieties provides an interesting marketing opportunity for growers. Given the number of new patented varieties that are under development, it is important for producers to understand the market potential for each new variety. Research has shown that consumer response to new fruit varieties is driven largely by fruit size and sweetness (e.g., Parker and Zilberman 1993; Heiman and Goldschmidt 2004). However, apples are one of the few fresh produce items where variety names take on the role of brands, and brands have been widely shown to influence consumer response (for a nice summary, see Keller 2007). In particular, there is a large literature in marketing that examines the anthropomorphic nature of brands, referred to as brand personalities. The five brand personalities include competence, excitement, ruggedness, sincerity, and sophistication (Aaker, 1997). We believe that three personalities, excitement, sincerity, and sophistication, can be used to describe the names of most apple varieties reasonably well. Figure 1 shows examples of modern apple varieties that fit with each personality, and apple varieties with names that use some combination of the personalities. Apple varieties that center on the excitement personality use sensory attributes in

“Brands are largely absent among fresh produce items; however, one notable exception is the apple market in which varieties partially take the place of brands. We developed an experiment to examine how consumers respond to different varietal names for NY1 which is a new managed apple variety introduced by Cornell. We found the name is an important factor in determining consumer response and the amount they were willing to pay for NY1.”

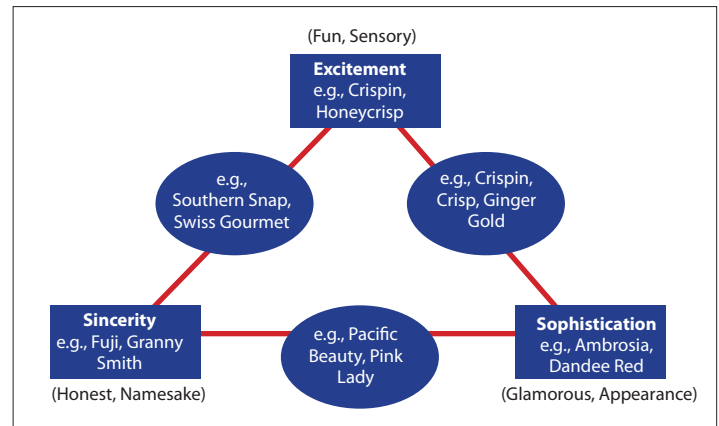


Figure 1. Brand Personalities and Attributes Associated with Selected Apple Varieties

the name, varieties that focus on the sincerity personality make reference to a person or place in the name, and varieties that adopt the sophistication personality use names that highlight the appearance of the apple. In addition, as shown in Figure 1, there are many new apple varieties that use names which position them between two of the personalities. For example, Crimson Crisp and Ginger Gold are varietal names that make reference to both the excitement and sophistication personalities.

We developed an experiment that introduced human subjects to five apple varieties, and we included treatments that employed different brand personalities for NY1, a new managed variety developed at Cornell University. The data collected in our experiment provided us with a unique opportunity to study the role of brands in the fresh produce category, a category that traditionally has had few brands (Kaufman, Handy, and McLaughlin 2000). Findings from our analysis allowed us to estimate the impact of different branding strategies for an apple that is not available commercially and does not yet have a brand. In addition, because the branding issue at hand is one for a patented product that requires producers to pay royalties and fees for the use of the variety, our results shed some light on the expected value of the patent under different brand personalities. Therefore, from a practical standpoint, our research provides valuable information for producers considering an investment in managed apple varieties.

Experimental Design

We asked a group of 42 undergraduate students to identify the personalities that best describe 13 apple varieties. Results from this exercise are shown in Table 1. Dandee Red, Flavor Haven, Honeycrisp, Piñata, and SweeTango were considered to have an exciting personality by at least 60% of the respondents. By the

Table 1. Personality Associations for Selected Apple Varieties by Students, N=42.

Apple Variety	Excitement	Sincerity	Sophistication
Burgundy Beauty	4 (9.8%)	4 (9.8%)	33 (80.4%)
Cortland	1 (2.4%)	37 (90.2%)	3 (7.4%)
Dandee Red	25 (61.0%)	10 (24.4%)	6 (14.6%)
Empire	3 (7.3%)	16 (39.0%)	22 (53.7%)
Flavor Haven	25 (61%)	8 (19.5%)	8 (19.5%)
Fuji	15 (36.6%)	12 (29.3%)	14 (34.1%)
Granny Smith	4 (9.7%)	35 (85.4%)	2 (4.9%)
Honeycrisp	22 (55.0%)	10 (25.0%)	8 (20.0%)
McIntosh	3 (7.3%)	32 (78.1%)	6 (14.6%)
Piñata	36 (87.8%)	1 (2.4%)	4 (9.8%)
Pink Lady	22 (53.7%)	1 (2.4%)	18 (43.9%)
Sweetango	31 (75.6%)	2 (4.9%)	8 (19.5%)
Williams	0 (0%)	35 (85.4%)	6 (14.6%)

same measure, Cortland, Granny Smith, McIntosh, and Williams were considered to have a sincere personality, and Burgundy Beauty was selected as the variety with a sophisticated personality. Empire, Fuji, and Pink Lady were not strongly linked to any of the personalities. Of the 13 apple varieties listed in Table 1, there are 7 that are widely available commercially, 3 are managed or club varieties with limited distribution in the United States, and 3 are fictitious names that we employed in a consumer experiment to explore the role of brand personalities.

An economic experiment was developed to examine consumer response to five apple varieties, including NY1 that will not be marketed commercially before 2014. We collected willingness to pay (WTP) information from subjects that were exposed to one of three treatments that provided different branding strategies for the new apple variety. Specifically, we used three different names for the new managed apple variety that were aligned with the three brand personalities described above.

We recruited only adult (non-student) subjects and paid participants \$25 each. The subjects were recruited through advertisements posted on *craigslist* and in the primary news publication distributed to staff members at Cornell University. Subjects were seated randomly at individual computer terminals with privacy shields, and were informed that all decisions they made would be kept strictly confidential. A maximum of 24 computer terminals were available, and the sessions ranged in size from 16 to 24 subjects. After signing a consent form, participants were given a brief introduction of the experiment, which included the amount of money they would earn, rules of the experiment, and were encouraged to view displays of the five apple varieties at the front of the lab (see the picture of the lab in Figure 2). Before the auctions commenced, participants were told that the apples were harvested in the fall of 2010, were produced in the United States, and were grown using conventional (non-organic) management practices.

In all treatments we provided identical information for five apple varieties, and subsequently conducted an auction for one pound of each variety (where the order of the auctions was randomized in each session). For each variety we displayed one pound of fruit at the front of the lab, showed a picture of the fruit in the tree, and described key technical details including brix, pressure at harvest (as a measure of firmness), and suggested uses (baking, cooking, and eating). In addition, we provided subjects in all treatments with the opportunity to taste a slice of



Figure 2. Subjects Participating in the Computerized Auction.

each apple variety before they placed a bid in the auction. In addition, participants were informed that one of the auctions would result in an actual transaction for the highest bidder, and that auction would be randomly chosen after all auctions were held. In this case, the subject with the highest bid for the randomly selected auction would buy one pound of fruit at the price they submitted (and the value of their bid was subtracted from their participation endowment). The auctions were programmed using Excel spreadsheets and Access databases with Visual Basic for Applications (see Figure 3).

Results

All subjects participated in auctions for one pound of Empire, Fuji, Honeycrisp, Piñata, and NY1. This suite of apples was chosen so as to represent a traditional variety (Empire), a newer variety (Fuji), a new variety (Honeycrisp), and another patented variety (Piñata). The three treatments assigned three different names, or personalities, for NY1. Based on responses shown in Table 1, we used the name Flavor Haven to represent an exciting personality, Williams was used to describe a sincere personality, and Burgundy Beauty was used to represent a sophisticated personality. A total of 194 adult (non-student) subjects participated in the experimental sessions, and given 5 bids per subject, 970 observations were collected and used in our empirical analysis. In each auction a bid clock was used starting at \$0.00 per pound and increased by \$0.10 increments every second with a maximum bid of \$5.00 per pound. After all auctions were completed, participants completed a computerized questionnaire eliciting demographic information and information describing purchase habits. Demographic variables included weight, height, age, income, and education; variables related to purchase habits included frequency of apple consumption, where consumer buy apples, desirability of specific attributes in apples, and likeability of various fruits.

Table 2 provides descriptive statistics that depict bidding activity for the 5 varieties and responses to the first 14 questions in the survey; information from the first 14 questions was related to demographics of our sample and was included in our regression analysis. The mean bid for one pound of Empire apples was \$0.99 per pound. The average bid was \$1.19 per pound for Fuji, and approximately \$1.13 per pound for both Honeycrisp and Piñata.

Across all treatments, the average bid for NY1 was \$1.25 per pound, and this suggests that the variety has the potential to generate a 12% price premium over the other varieties included in the experiment. In addition, Table 2 shows the average bids for NY1 using the different names, and here we see that consumer's WTP increased substantially when the name Flavor Haven was used (a price increase of 27% compared to the other four varieties). The bottom portion of Table 2 shows the responses to the demographic questions included in the survey. The average age of our sample was 42.7, it was comprised of 79% females and 81% Caucasians, the average Body Mass Index (BMI) was 27.2, 36% had children in the household, 83% were the primary shoppers, and the average number of fruit servings (subjects were instructed that one serving was equal to one cup) per day was 2.05.

Data describing consumer demographics were used as explanatory variables along with treatment variables for the brand personalities in the WTP econometric model. Three model specifications that examined various interaction terms between varieties and brand personalities were developed. All models use bid data from the 194 subjects. The coefficients in the first four rows in Table 3 describe consumers' WTP for varieties relative to the Empire variety, the next eight rows examine the interaction between brands and varieties relative to the Empire variety and the Williams brand, and the final 17 rows show the estimated coefficients for the demographic variables included in the models.

The first column in Table 3 presents the baseline results from our experiment. The intercept estimate is \$1.06 per pound and the coefficients for the different varieties—representing consumers' marginal WTP for the varieties—range between \$0.14 and \$0.28 per pound and are all statistically significant. These results show that the average additional WTP (relative to the Empire variety) for Fuji, Honeycrisp, and Piñata is \$0.176, and that NY1 yields \$0.102 more or a price premium of 58%.

The second column in Table 3 reports WTP estimates for the varieties plus it includes interaction terms for

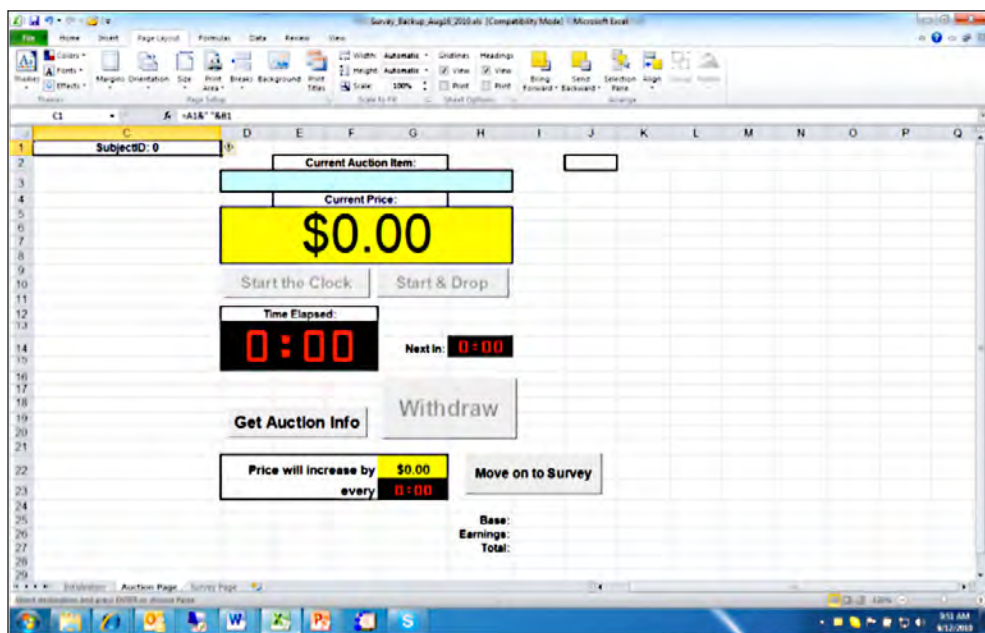


Figure 3. Auction Screen used by Subjects to Enter Bids for Apple Varieties.

Table 2. Summary Statistics for Data Collected from Subjects.

Variable	N	Mean	Standard Deviation	Minimum	Maximum
WTP(\$ per pound)					
Overall	970	1.14	0.78	0	4.00
Empire	194	0.99	0.71	0	3.70
Fuji	194	1.19	0.77	0	4.00
Honeycrisp	194	1.13	0.76	0	3.20
NY1	194	1.25	0.79	0	3.50
Piñata	194	1.13	0.82	0	3.90
Flavor Haven	64	1.41	0.85	0	3.50
Burgundy Beauty	64	1.18	0.79	0	3.00
Williams	66	1.15	0.74	0	3.00
Demographic Variables					
Age	970	42.73	10.43	19	63
Female	970	0.79	0.40	0	1
Caucasian	970	0.81	0.39	0	1
African	970	0.02	0.14	0	1
Asian	970	0.09	0.30	0	1
Hispanic	970	0.01	0.10	0	1
Native	970	0.01	0.10	0	1
Other race	970	0.05	0.21	0	1
Income	970	2.17	0.91	1	5
Education	970	2.82	1.19	1	5
Weight (pounds)	970	167.99	44.08	100	300
Height (inches)	970	65.84	3.29	56	75
BMI	970	27.23	6.59	16.05	48.71
Household with children	970	0.36	0.48	0	1
Primary shopper	970	0.83	0.38	0	1
Vegetarian	970	0.03	0.17	0	1
Organic consumer	970	0.74	0.44	0	1
Restaurant meals per week	970	2.51	2.17	0	16
Owens a garden	970	0.46	0.49	0	1
Fruit per day	970	2.05	1.18	0	10



NY1 with two of the three brands. Here we see that the estimated coefficient representing WTP for the new variety falls to \$0.18, and is only statistically significant at the 15% level, yet the estimated coefficient for the two interaction terms are quite different. Using the name Burgundy Beauty (relative to using the name Williams) leads to a total marginal WTP of approximately \$0.22 (\$0.18 plus \$0.04) per pound, whereas using the name Flavor Haven leads to a combined marginal WTP of approximately \$0.44 (\$0.18 plus \$0.26) per pound.

The third column in Table 3 shows results for a model that includes interaction terms for all variety-brand combinations. The estimated coefficient describing the marginal WTP for the Fuji variety increases to \$0.28 and remains statistically significant; however, the coefficients for the other varieties are not statistically significant at the 10% level. Similar to the results from the second column, the name Flavor Haven has a positive and statistically significant effect of the WTP for NY1 while the name Burgundy Beauty has a much smaller coefficient that is not significant at the 10% level. Results in the third column also show that the names Flavor Haven and Burgundy Beauty for NY1 have small and statistically insignificant effects on consumers' WTP for Fuji and Honeycrisp. More importantly, and perhaps surprisingly, the two names have a nearly equal and statistically significant effect on consumers' WTP for the Piñata variety.

Several of the demographic variables also had a significant impact on consumers' WTP for the apples included in our experiment. The results in Table 3 indicate that WTP decreases with age, and for Asian-Americans, primary shoppers, vegetarians, and with the overall consumption rate of fruit. It is somewhat counter-intuitive to see a negative coefficient on the vegetarianism variable; however, it may be the case that vegetarians are more cognizant of the relative prices for various fruits and vegetables, and submitted lower than average bids for the apples in our experiment. Our results also show that consumers' WTP increased with education, increased for subjects that indicated a preference for organic products and meals at restaurants, and increased for those with a garden at home.

Marketing Implications and Conclusion

Our research shows that brands have the capacity to be important in developing a market for NY1. When this new managed apple variety was introduced to consumers with an exciting personality it generated a \$0.44 per pound price premium over the Empire variety; when introduced with a sophisticated personality it generated a price premium of \$0.22 per pound which is similar to the price premiums observed for Fuji, Honeycrisp, and Piñata (all relative to the Empire variety). In addition, using different brand personalities had

Table 3. Willingness To Pay Estimates Using Experimental Data and a Tobit Regression Model.

Explanatory variables	Model 1 (only apple varieties)	Model 2 (interaction terms for new variety)	Model 3 (all interaction terms)
Intercept	1.055***	1.057***	1.047***
Apple varieties			
Fuji	0.229***	0.229***	0.281**
Honeycrisp	0.155*	0.155*	0.152
NY1	0.278***	0.18	0.178
Piñata	0.144*	0.144*	-0.044
Interaction terms^a			
Fuji-Flavor Haven			-0.086
Fuji-Burgundy Beauty			-0.072
Honeycrisp-Flavor Haven			0.028
Honeycrisp-Burgundy Beauty			-0.021
NY1-Flavor Haven		0.258*	0.26*
NY1-Burgundy Beauty		0.039	0.042
Piñata-Flavor Haven			0.282**
Piñata-Burgundy Beauty			0.283**
Demographics			
Age	-0.009***	-0.009***	-0.009***
Female	0.041	0.04	0.04
African-American	0.082	0.064	0.062
Asian-American	-0.239**	-0.239**	-0.237**
Hispanic	-0.424	-0.409	-0.396
Native American	-0.106	-0.094	-0.109
Other race	0.043	0.039	0.045
Income	-0.016	-0.017	-0.015
Education	0.058**	0.06**	0.06**
BMI	0.006	0.006	0.006
Household with children	-0.034	-0.031	-0.023
Primary shopper	-0.142*	-0.141*	-0.14*
Vegetarian	-0.362**	-0.361**	-0.366**
Organic consumer	0.127**	0.124*	0.124*
Restaurant meals per week	0.03**	0.03**	0.031**
Owens a garden	0.117**	0.116**	0.113**
Fruit per day	-0.049**	-0.049**	-0.05**

Note: * denotes statistical significance at the 10% level, ** denotes statistical significance at the 5% level, and *** denotes statistical significance at the 1% level.

^a We used the name "Williams" to represent a sincere brand, the name "Flavor Haven" to represent an exciting brand, and the name "Burgundy Beauty" to represent a sophisticated brand.

very little spillover effects in the markets for the traditional apple varieties included in the experiment, yet had statistically significant impacts for NY1 and the other managed variety included in the experiment.

Both the exciting and sophisticated brand personalities had statistically significant effects on consumers' WTP for Piñata (the other managed variety), and the effects were nearly equal. This finding indicates that adopting an exciting brand personality would be best for NY1, whereas if NY1 adopts a sophisticated brand personality it would be best for the other competing managed variety. Because Piñata already has adopted an exciting personality, prices for Piñata would be higher if NY1 adopts a sophisticated personality. This type of branding arrangement would differentiate both managed varieties from the category personality, and from each other. Overall, the results suggest that consumers may consider managed apple varieties to be in a separate market from traditional varieties, and that the impacts from branding strategies for managed varieties will be greatest among these very closely-related products.

Ultimately the success of a new product will depend on consumer response, and it is especially difficult to measure how well a new apple variety will perform in the marketplace given the long lag between adoption and fruit sales. Our analysis offers new information for apple producers and plant breeders on the market potential for new managed apple varieties. The results presented here begin to highlight the value of a license that a producer would need to purchase for patented apple varieties. It is also clear that the varietal name has the capacity to influence the value of the license. Further research is needed to better understand the optimal licensing structure between growers and plant breeders for such varieties. One important issue in the analysis of an optimal licensing structure is the appropriate mix of royalty payments for trees and annual fee payments for fruit sold.

Acknowledgements

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A Crop Insurance Strategy for Apples



Apple Hill Orchard owner John Barber, Jr. of Whitehall, NY talks about managing weather risks with crop insurance.

WHITEHALL, NY -- Apple growers know that their two biggest weather risks are spring frost and hail. John Barber, Jr. of Whitehall uses crop insurance to help manage those risks.

Barber learned about growing apples on the job, enlisting help from a Vermont pomologist to establish his spraying schedule and get a strong start in orchard management.

“We have approximately 25 acres here that consist of about 2800 trees,” Barber says of the orchard he bought in 2000 from a retiring farmer. “We have four major varieties; we have Macs, Cortlands, Empires and Red Delicious. And we have a few [Northern] Spies and a few other minor varieties.”

Since entering the business, Barber has experienced weather related losses that affected yields. Barber purchases buy-up coverage to insure 60% of average

yield, and has had to file two full claims since 2000.

“You can control just about everything else, but you can’t control your frosts in the spring time, and you can’t control hail, which is the major four-letter word in the apple industry,” says Barber.

In New York State, apples may be insured as processing or as fresh-market fruit. The fresh-market option allows a higher price election per bushel, higher yield levels, as well as adjustments for loss that affect fruit grade and quality. To qualify for the fresh-market option, the grower must keep records to show that at least 50 percent of the farm’s apple acreage was sold as fresh fruit for any one of the past four years.

According to Barber, “I would definitely recommend the fresh fruit option, because so much money goes into your fertilizers and your spray material, and it gives you peace of mind that you’re protected.”

Apple crop insurance is available in 25 New York counties, and 74% of New York’s 42,000 eligible apple acres are covered. Growers in counties without designated apple coverage may be able to participate with a special written agreement.

The New York State Department of Agriculture and Markets has partnered with USDA Risk Management Agency (RMA) to provide crop insurance education to New York State farmers. For more information, please visit the NYS Crop Insurance Education website at www.agmkt.state.ny.us/AP/CropInsurance.html or contact Sarah Johnston at 518-457-4531 or 800-554-4501. To find a crop insurance agent, please contact your local Farm Service Agency (FSA) office or use the USDA RMA crop insurance agent locator tool on the web at www3.rma.usda.gov/apps/agents/.



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