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EXECUTIVE SUMMARY

The rapid expansion of ethnic populations presents significant opportunities for fruit and vegetable producers along the East Coast to take advantage of their close proximity to densely populated areas. This study was undertaken to document and quantify the current market for selected ethnic vegetables and assess the demand so farmers may grow crops targeted from a demand perspective. The project has two phases; Phase I and II. Phase I includes assessment and quantification of ethnic market demand to focus production efforts in the subsequent phase. Phase II utilizes the demand findings to develop production trials, grower recommendations, and strategies to coordinate year-round production of select ethnic crops to serve this market niche. The procedural synopsis contained in this publication documents the survey methods and crop identification processes used to identify and quantify the market, assess demand, and select appropriate crops for production trials. It provides an overview of the market-first approach and interdependency of Phase I and II necessary to address the existing local supply-demand gap.

The specific ethnic market subjects of study were the Asian and Hispanic segments, chosen for their strong recent growth and continued growth expectations. The top two sub-groups within each of these segments were chosen for the study; Chinese and Asian Indian (Asian sub-groups) and Puerto Rican and Mexican (Hispanic sub-groups). The geographic focus is the East Coast and includes Washington D.C. and sixteen states bordering the East Coast. A statistically representative sampling of consumers from each of the four ethnic sub-groups in area was gathered via a stratified sampling method. Bilingual phone surveys were developed and administered and 1,084 completed surveys were collected to assess ethnic produce demand, quantify the current market, and acquire purchase data for ethnic crops to prioritize selections for production trials.

The ethnic crops of interest were identified through a selection process that began with a crop expert panel review of an initial list of over 100 ethnic crops to select 42 produce items for inclusion in the ethnic consumer survey questionnaire. Results of the survey of

271 randomly selected East Coast consumers from each of the four ethnic groups were used to rank the crops included in the questionnaire, within ethnicity, according to expenditure and/or purchase data. Multiple criteria were established to rank produce items and allow for comparisons across produce items of various unit types (i.e. pounds, bunches, and numbers). The surveyed demand criteria included average expenditures, frequency of purchase, and volume of purchase. In addition to the surveyed demand, crops were also evaluated for production research potential (research interest, yield potential, and anticipated cost effectiveness) by production trial participants in three states. A combined assessment (actual survey demand and estimated production potential) was particularly important in cases where a single systematic demand approach (comparison) was not sufficient to distinguish between crops for research prioritization purposes.

The result of the production research prioritization process based upon primarily survey demand, combined with production considerations, yielded a targeted list of 28 (of 42) crops recommended for production trials. Logistical concerns (space, labor and budget constraints) drove decisions to limit the number of replicated crops to twelve and include crops of similar species suited for production on black plastic mulch with drip irrigation systems. Species with cross-ethnic demand were given higher priority for replication to maximize the return on research efforts. Also, despite not using the most appropriate production system for them, the crops with the highest overall survey rank from each of the ethnic groups was included to ensure that the crops with the highest demand from each group were represented, once the cross-ethnic list had been exhausted. The same underlying factors that supported the decisions for replicated trial selections also contributed to the selection of ten crops for demonstration trials (incremental research benefits, seed availability, and survey demand).

Demonstration and research trials are already underway and will ultimately be established at six sites located in three states along the East Coast (two in Florida, one in Massachusetts, and three in New Jersey). Trials are to be conducted at each location for two seasons. Due to varying climates, production seasons vary from site to site and

special attention to variations in yield and quality of produce, as may be affected by season and geographic location, is warranted. Crop quality and yield parameters will be evaluated statistically to determine suitability for commercial production and develop recommendations for geographic sequencing of production, by month/season, to sustain a twelve month production supply in the eastern United States. Information from the production trials will be combined with case study findings to make final crop recommendations and communicated accordingly to East Coast farmers. Completion of the second phase of the study is targeted for 2009.

1. Introduction

Economic opportunities have arisen in the last decade for specialty crop agriculture catering to the ethnically diverse consumers along the eastern coast of the United States (Govindasamy et al. 2006; Mendonca et al. 2006**;** Sciarappa, 2001-2003; Tubene, 2001). United States Census data show average population increases of 13% from 1990 to 2000 as compared to 48% for Asians and 58% for Hispanic (Census 1990, 2000). The ethnic population boom along the East Coast is even more pronounced. In ethnically diverse population hubs such as the Northeast Region, the Asian population growth reached 60%. Similarly growing Hispanics concentrations are geographically dispersed along the East Coast, with just five states (FL, GA, NY, NC, and NJ) accounting for over one fifth of the nation's Hispanic population growth and yielding a combined growth rate of 59%. The rapid expansion of ethnic populations presents significant opportunities for fruit and vegetable producers in the region to take advantage of their close proximity to densely populated areas. To help East Coast farmers remain economically viable, this U.S. Department of Agriculture, National Research Initiative study was undertaken to document and quantify the current market for selected ethnic vegetables. Assessing demand allows farmers to target crops with the highest potential return.

A survey based on random sampling was prepared for four predominant and growing ethnic groups, specifically; Chinese, Indian, Mexican and Puerto Rican. Two hundred seventy one East Coast residents were interviewed from each selected ethnicity totaling 1,084 samples. Crop production experts along the East Coast from Florida to Massachusetts narrowed a potential list of over 100 fruits and vegetables based upon production and climatic criteria. Bilingual surveys of the ethnic consumers from the identified groups indicated food crop purchasing preferences of the top 10-12 crops for each group which helped refine selections for field trialing.

The general objectives of the overall study are to:

1) identify and estimate the market size for ethnic segments that present significant opportunities to regional growers;
2) assess demand, conduct production studies, and make production recommendations for appropriate ethnic produce items for this market; and
3) develop strategies and production timelines to coordinate year-round production of select ethnic crops to exploit this market niche.

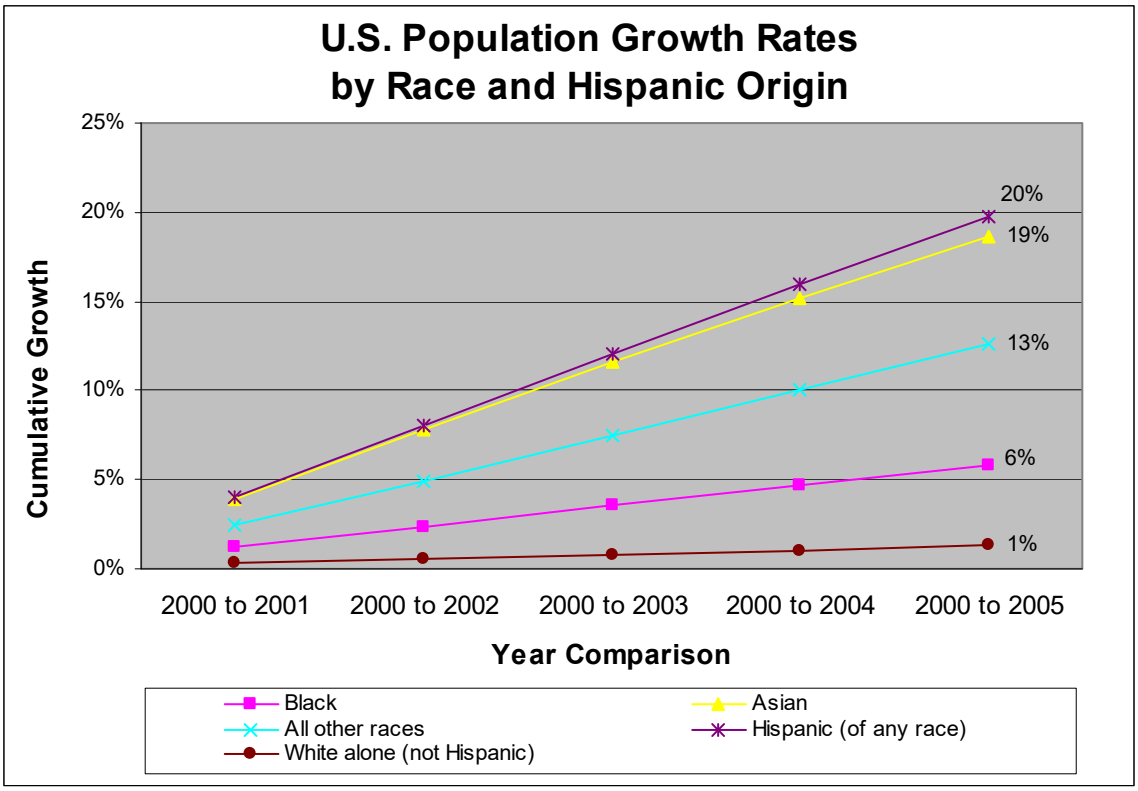
The intended outcome of the project is to generate and distribute science-based information about production, marketability, and utilization of selected ethnic food crops and herbs. This initiative bridges the supply-demand gap, delivering practical solutions to economic problems faced by many vegetable growers, and contributes to the nutritional and health needs of regional consumers.

The procedural synopsis contained in this publication documents the survey methods and crop identification processes used to identify and quantify the market, assess demand, and select appropriate crops for production trials in order to address the supply-demand gap (Phase I of overall project). The balance of the overall project objectives which include production crop recommendations, strategies, and timelines (Phase II) will be provided in a separate publication, after production trials are completed, to deliver science-based supply-side recommendations.

2. Research Approach

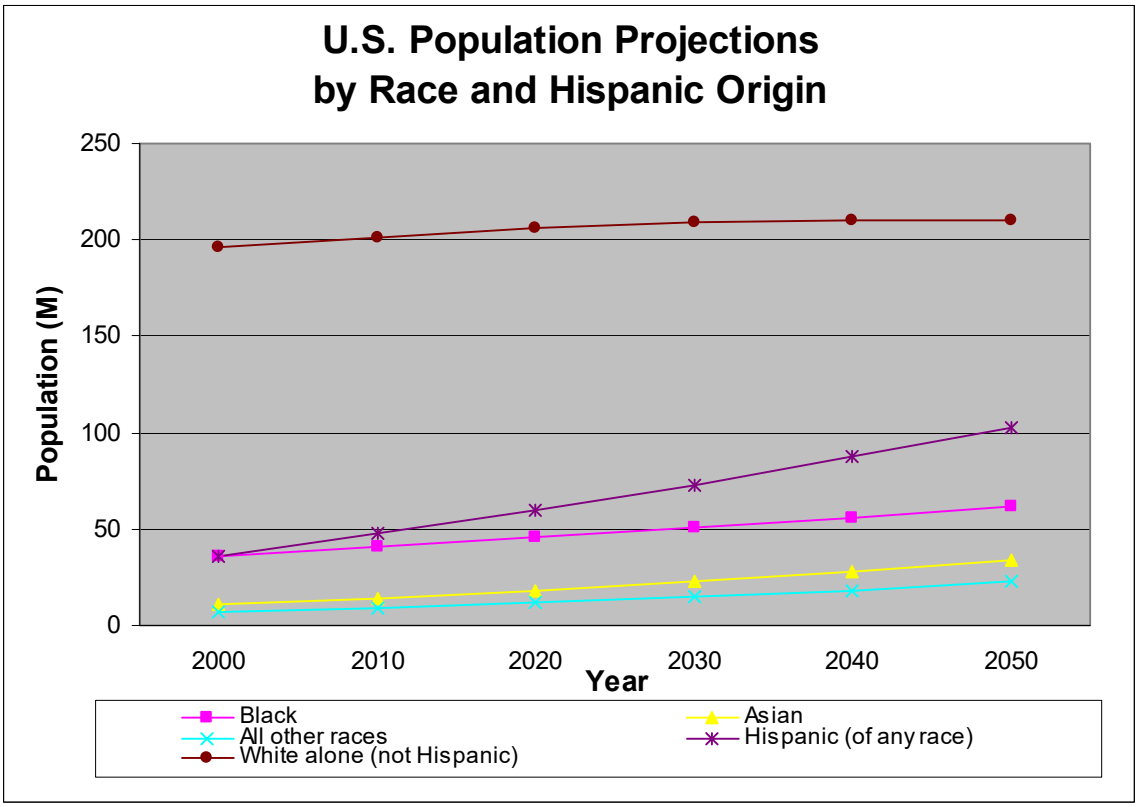
National trends. Opportunities to capture anticipated market growth in certain ethnic markets were identified, specifically for ethnic market segments growing at faster rates than their ethnic and/or non-ethnic counterparts and for which growth is expected to continue. The primary groups meeting these criteria included Asians and Hispanics (recent rate of growth; Fig. 2.1. and continued growth expectations; Fig. 2.2.). The top two sub-groups within each of these segments were chosen for the study; Chinese and Asian Indian (Asian sub-groups) and Puerto Rican and Mexican (Hispanic sub-groups).

Figure 2.1. Recent U.S. Population Growth Rates



Source: Population Estimates; April 1, 2000 to July 1, 2005, Population Division, U.S. Census Bureau, 2006

Figure 2.2. Projected Trends in U.S. Population



Source: "U.S. Interim Projections by Age, Sex, Race, and Hispanic Origin", U.S. Census Bureau, 2004

Rationale and Significance. Despite the competitive disadvantages relative to year-round producers in western production areas, significant comparative advantages exist for local East Coast growers as a result of their proximity to densely populated areas rich in ethnic diversity (Govindasamy, Nemana, Puduri, Pappas, 2006). Increasingly, these producers adopt new crops or create new value-added products in order to remain economically viable. Growing ethnic crops presents opportunities for producers to exploit existing comparative advantages associated with serving densely populated local ethnic markets in order to increase profitability and sustain farming operations. The coordination of production and marketing are critical to avoid the threats of rapid over-production (which can quickly lead to depressed prices) and to overcome inadequate marketing infrastructure in order to move product into community markets. Establishing or extending existing cooperative marketing associations along the East Coast, from North

to South, can create an improved market system that provides appropriate year-round supplies to the area.

*Data Collection***.** The research program included the development, administration, and data collection from an ethnic consumer survey. The survey objective was to gather relevant consumer information from four ethnic groups (Chinese, Indian, Mexican, and Puerto Rican) to include demographics, shopping patterns, preferences and opinions, related practices, willingness to pay premiums over traditional American produce, and typical produce expenditures. The data collected was utilized to analyze ethnic consumers' patterns of purchase and propensity to purchase ethnic produce, estimate the associated market potential, and prioritize subsequent production studies of individual crops in order to make recommendations to for local production.

Market Estimation and Production Research. The survey expenditure data collected included both respondent estimates of average spending on all of their produce, ethnic and total (including conventional American), and specific purchase data on selected ethnic produce items. The ethnic produce expenditure data provided the data necessary to estimate the respective ethnic produce markets for each of the four ethnicities of study. The combination of ethnic and total produce expenditure allowed for a relative comparison. The ethnic produce item specifics helped to guide decisions for production research trials. The 42 produce items included in the survey questionnaire were selected from an initial list of over 100 ethnic crops, as a result of a crop expert panel review. The surveyed crop list was further refined through a systematic process based on the survey results (demand) and relevant production considerations (supply) for the local marketplace.

3. ETHNIC CONSUMER SURVEY

3.1. Sample and Method

Sample sizes for each ethnicity were identified based on 2000 Census populations for Chinese, Asian Indians, Mexicans and Puerto Ricans in the 16 East Coast states and the District of Columbia (Table 3.1.). Sample sizes of 271 surveys for each of the four ethnic

groups were statistically determined for a total of 1,084 surveys of ethnic produce consumers. (The sampling error associated with an East Coast sample of 271 people from each of the four ethnic groups is approximately ±5% with a 90% confidence interval.)

Table 3.1. East Coast Ethnic Populations (United States Census 2000)

	ETHNIC GROUP			
STATE	Chinese	Asian Indian	Mexican	Puerto Rican
Connecticut	19,172	23,662	23,484	194,443
Delaware	4,128	5,280	12,986	14,005
District of Columbia	3,734	2,845	5,098	2,328
Florida	46,368	70,740	363,925	482,027
Georgia	27,446	46,132	275,288	35,532
Maine	2,034	1,021	2,756	2,275
Maryland	49,400	49,909	39,900	25,570
Massachusetts	84,392	43,801	22,288	199,207
New Hampshire	4,074	3,873	4,590	6,215
New Jersey	100,355	169,180	102,929	366,788
New York	424,774	251,724	260,889	1,050,293
North Carolina	18,984	26,197	246,545	31,117
Pennsylvania	50,650	57,241	55,178	228,557
Rhode Island	4,974	2,942	5,881	25,422
South Carolina	5,967	8,356	52,871	12,211
Vermont	1,330	858	1,174	1,374
Virginia	36,966	48,815	73,979	41,131
TOTAL	**884,748**	**812,576**	**1,549,761**	**2,718,495**

Further sample size requirements were established, based upon ethnic group by state in accordance with a stratified random sampling method (stratified random sampling was used where the sample is selected such that ethnic groups are represented in the same respective proportion, by state, as they occur in the population, per Census 2000), with a minimum requirement of one sample per state for each ethnic group. An additional sample size of 271 was established, irregardless of state and ethnic group, to gather data in a short survey delivered to non-purchasers of ethnic produce to assess their reasons for not purchasing these items and determine their willingness to buy ethnic produce based upon the availability of certain attributes.

3.2. Implementation and Outcomes

Administration. An outsourced firm specializing in telephone and internet data collection, The Wats Room Incorporated (WATS), was contracted to conduct 1,355 telephone interviews using Computer-Assisted Telephone Interview (CATI) technology. Their surveys were conducted by phone to ensure that a statistically significant randomized sample was obtained. This entailed targeting and achieving the required sample sizes by ethnicity and state while minimizing any costs associated with sample surpluses in certain states and deficits in others (as might occur with a mail-administered survey). The phone-administered questionnaires were to be completed by the principal grocery shopper in each household, as identified by each respondent with prompting from the interviewer.

Qualified (bi-lingual) interviewers received on-site Human Subjects Certification Program (HSCP) training, per Federal-wide Assurance guidelines, in addition to survey-specific training and practice, prior to conducting actual interviews. (HSCP includes background material on human subject research which includes history, policies, regulations, procedures and ethical practices.) A member of the Rutgers research team was on-site at WATS in Rochelle Park, New Jersey during this training to monitor the process, tour the facility, and oversee operations. Ongoing interviewer monitoring

throughout the field period was conducted by WATS. Interviewing commenced in late February 2006, continued into March, with initial results available by the end of March and final data files provided in early May, 2006.

Response Rate. Over 13,000 potential interviewee leads were utilized by WATS in order to meet the sample size requirements. These leads were generated by ethnic surnames, selected using a randomized selection process, and further randomized through CATI programming. Ultimately, a total of 1,366 phone surveys were completed by ethnic consumers as follows; 1,084 long-version surveys by purchasers of ethnic produce (271 ethnic produce purchasers from each of the four ethnicities surveyed; Chinese, Asian Indian, Mexican, and Puerto Rican) and 282 short-version surveys by non-purchasers of ethnic produce (defined as not having purchased within the past year), irrespective of ethnic group (Table 3.2.; the actual number of short-version surveys collected exceeded the objective slightly, resulting in 1,366 useable surveys as compared to the original 1,355 objective).

Roughly 10% of the numbers selected at random for each ethnic group yielded complete interviews (Table 3.3.). However, many of telephone numbers originally selected were non-residential or non-working numbers. Removal of these non-working numbers from the equation reveals that 14% of the calls to working residential numbers resulted in completed interviews. Many multiple call attempts to working residential numbers were unsuccessful in contacting the principal grocer shopper in the house, as required for the survey interview. Surveys were conducted between 5 pm and 9 pm EST to accommodate those shoppers that work. Despite repeat call attempts of up to 10 telephone calls and/or three appointment setting follow-ups per number, many qualified interviewees could not be reached. The cooperation rate, or completed interviews as a percent of calls to a qualified (accessible) interviewee, was approximately 37% (the cooperation rate is defined for these purposes as completed interviews as a percentage of the sum of completed interviews, refusals, and language barriers cited.).

Table 3.2. Ethnic Consumer Survey Respondent Summary

	ETHNIC GROUP				
STATE	Chinese	Asian Indian	Mexican	Puerto Rican	Total
Connecticut	6	8	4	19	37
Delaware	1	2	2	1	6
District of Columbia	1	1	1	1	4
Florida	14	23	63	46	146
Georgia	8	15	48	4	75
Massachusetts	26	15	4	20	65
Maryland	15	17	7	3	42
Maine	1	1	1	1	4
North Carolina	6	9	43	3	61
New Hampshire	1	1	1	1	4
New Jersey	31	56	18	36	141
New York	130	83	45	104	362
Pennsylvania	15	19	10	23	67
Rhode Island	2	1	1	3	7
South Carolina	2	3	9	1	15
Vermont	1	1	1	1	4
Virginia	11	16	13	4	44
Purchasers*	271	271	271	271	1,084
Non-purchasers**	107	36	105	34	282
Total Surveys	**378**	**307**	**376**	**305**	**1,366**

** Purchasers are respondents that indicated they have purchased ethnic fruits and vegetables within the past 12 months.*

*** Non-purchasers are respondents that indicated they have not purchased ethnic fruits and vegetables within the past 12 months.*

Table 3.3. Ethnic Consumer Survey Administration

Ethnic Produce Survey
Summary & Call Completion Analysis

	COMPLETED SURVEYS	Chinese	Asian Indian	Mexican	Puerto Rican	Total
	Purchasers	271	271	271	271	1,084
	Non-purchasers	107	36	105	34	282
	TOTAL	**378**	**307**	**376**	**305**	**1,366**
	CALL COMPLETION ANALYSIS					
a	Complete surveys	378	307	376	305	1,366
b	Total number of leads	3,505	3,514	3,421	2,790	13,230
	Residential or Non-working #s:	*550*	*700*	*1,454*	*882*	*3,586*
c	Working Residential #s (complete, refusals, language, max calls)	2,955	2,814	1,967	1,908	9,644
d	Refusals	669	739	221	245	1,874
e	Language Barriers (including deaf)	199	121	85	23	428
f	Live (i.e. at least one call attempt made; active phone # determination)	1,514	1,622	393	866	4,496
a/b	Completion Rate = Complete/Total numbers selected	11%	9%	11%	11%	**10%**
a/c	Rigid Response Rate = Complete/Working Residential #s	13%	11%	19%	16%	**14%**
a/(a+d+e)	Cooperation Rate = Complete/(Complete + Refusals + Language Barrier)	30%	26%	55%	53%	**37%**

Nuances of Ethnic Languages and Crop Names. The surveys were administered by trained, bilingual phone interviewers in order to minimize response bias due to potential language barriers. The interview languages made available were as follows; (1) Chinese interviews offered/conducted in English, Mandarin, and Cantonese; (2) Indian interviews offered/ conducted in English and Hindi; and (3) Mexican and Puerto Rican offered/conducted in English and Spanish (reflective of respective dialect differences between the two countries of origin; used, as needed, according to interviewer confirmation of respondent's country of origin).

Both the targeted call completion time for ethnic produce purchasers and the WATS estimated completion time by WATS, prior to survey implementation, were under twelve minutes. Average completion times by ethnic group actually ran up to three minutes longer, depending on ethnicity, with the Asian (Chinese/Indian) segments being at the higher extreme and the Hispanic (Mexican/Puerto Rican) segments closer to the original estimate (Minutes; 15.39 Chinese, 13.64 Indian, 12.48 Mexican, 12.31 Puerto Rican). A greater need for language/translation assistance, particularly in crop name recognition, by Asian versus Hispanic interviewees was cited by WATS as the primary reason for the extended call times. In anticipation of such crop name recognition issues, the bi-lingual interviewers were well-prepared in advance of survey implementation to address these crop name recognition issues and mitigate any potential reduction in survey completions. Interviewers were provided with additional crop name variations and/or crop pictures to ensure interviewer crop familiarity and increase their ability to ensure the same for survey respondents. Therefore, although the Asian respondents experienced longer interview times than their Hispanic counterparts, their call completion rates were similar (between 9% and 11% for all 4 groups surveyed).

3.3. Design; Sequence and Content

Two sets of data were collected, according to the two versions of the survey; long and abridged. The questionnaire was designed to first assess whether the ethnic respondent was a consumer of ethnic produce (in the past twelve months) or not, using a "yes" or "no" screening question. Then a skip sequence was used by the interviewer, depending on the interviewee's response, to either; if *"yes"*, continue with a line of questioning that will help to identify ethnic produce demand factors, or if *"no"*, identify reasons for not purchasing ethnic produce (potential market opportunities).

The "purchasers" (respondents answering in the affirmative) proceeded to complete the longer form of the survey, inclusive of questions about their purchase patterns (frequency, spending, location or point of purchase, quantity, price, and expenditures) and preferences and opinions with regard to product, placement, and price. Such inquiries were made to quantify demand, assess the importance of product attributes, compare

ethnic versus conventional outlets (consumer perception), and determine price potential (via consumer willingness-to-pay a premium over comparable American or conventional substitutes). These respondents were also asked questions about different promotions and advertisements and whether or not they influence purchase decisions. In addition, each respondent was asked about related practices (whether or not he/she grows ethnic produce for consumption at home and whether he/she is a vegetarian). Demographic inquiries were made with regard to neighborhood, residency, household size and age composition, languages and proficiency, and country of origin, in addition to other basic socio-economic factors (age, education, income, etc.).

The "non-purchasers" (respondents with a negative answer) were urged to provide reasons they do not generally purchase ethnic produce and were prompted with plausible causes, if need be, such as "do not like ethnic produce", "lack of availability", "poor selection", "ethnic outlet not available or too far", or "other". These respondents then proceeded to complete the abridged form of the survey.

Both purchasers and non-purchasers were asked questions about their *relative* willingness (i.e. more willing, indifferent, less willing, or unsure) to buy ethnic produce based on certain factors and/or product attributes.

The long version of the survey (completed by purchasers only) was intended to gather demand *and* marketing information inclusive of the proverbial "4 P's" of marketing (Product, Placement, Price, and Promotion). The results of these surveys were used to assess the market demand for the respective high-potential ethnic markets, and to direct subsequent research (i.e. prioritize production crops) to satisfy and/or capture some of this demand. The abridged survey version (completed by "non-purchasers", irrespective of ethnic group), was collected to ascertain reasons for non-purchase and identify potential new, extended opportunities to exploit these markets. This shortened version gathered primarily product attribute information for promotional purposes, to extend the marketing reach of the initial project efforts to potentially underserved markets.

3.4. Data Purpose

Consumer Demographics, Patterns, Preferences, and Practices. The purpose of the socio-demographic data collection is to identify relationships between ethnic consumer expenditures and the respective demographic profiles. In addition to the typical socio-demographic data (age, education, income, etc.), information such as birthplace, length of residency in the United States, and age of immigration to the United States was collected to measure acculturation.

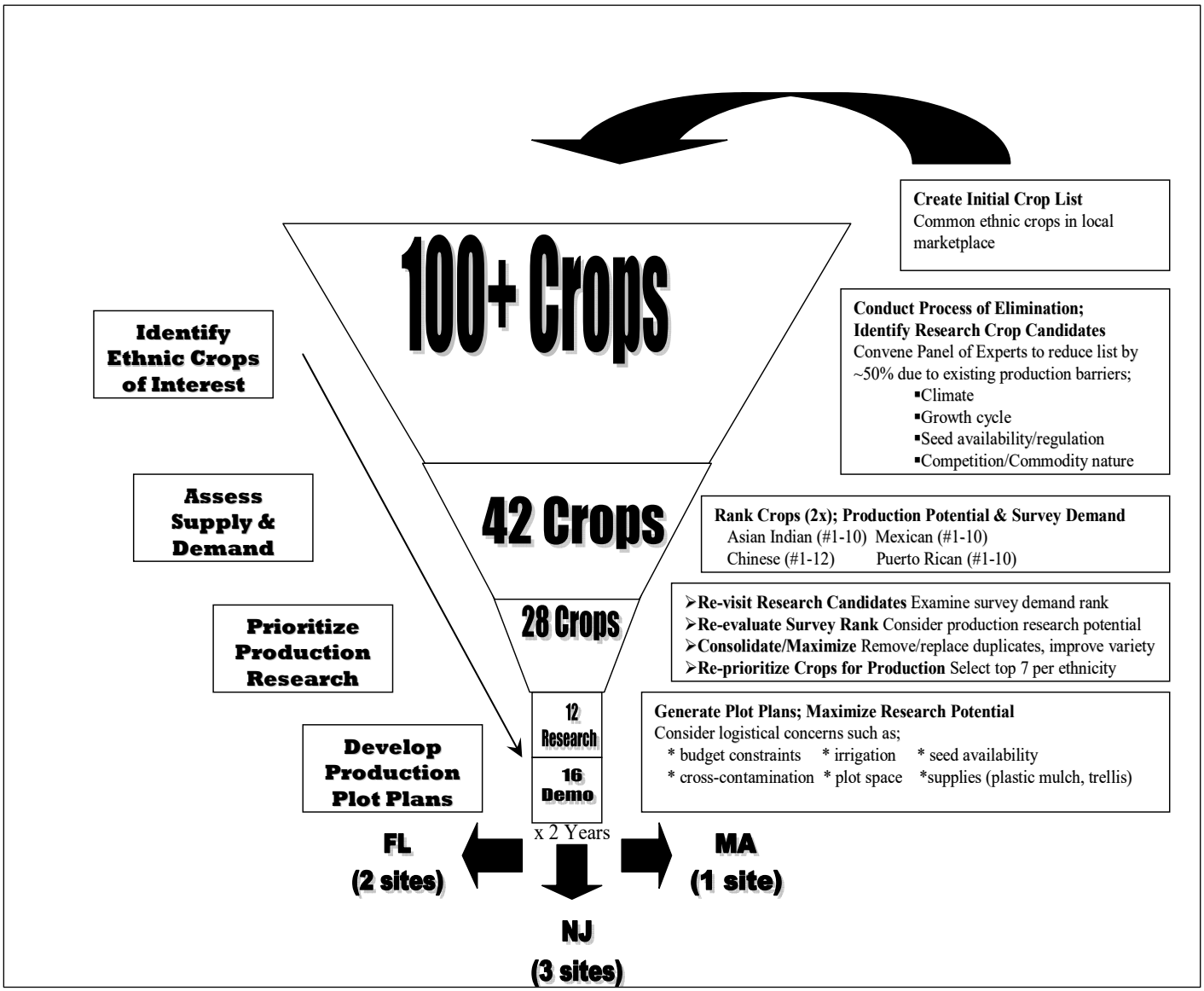
Additional analysis of the survey sample expenditures and demographics as they correspond to consumer shopping patterns, preferences, and related practices, will be utilized to develop predictive demand models for the larger populations. These models will facilitate effective distribution efforts by enabling producers, wholesalers, and retailers to target appropriate markets and locations, based upon demographic profiles and geographic population concentrations. This will help to marry the supply with local demand, as appropriate, to optimize marketing efforts.

Produce Expenditures. The preliminary focus of the purchase pattern survey results data was to quantify the average weekly expenditure for specific ethnic crops to prioritize the subsequent production research. Detailed data including the quantity, unit of measure (pounds/bunches/numbers), price, and average expenditure for each produce item was collected and analyzed. Once summarized, this data yielded average expenditures for each crop, by ethnic group, and served as a common denominator to compare and prioritize crops across groups (described in greater detail in the "Crop Selection Process" section that follows).

4. CROP SELECTION PROCESS

The crop selection process began with a crop expert panel review of an initial list of over 100 ethnic crops to select 42 produce items for inclusion in the ethnic consumer survey questionnaire (Fig. 4.1). The surveyed crop list was further refined through a systematic process based on the survey results (demand) and relevant production considerations (supply) for the local marketplace, to arrive at a list of 28 crops to enter into production trials (12 research and 16 demonstration plots).

Figure 4.1. Crop Selection Process



4.1. Identify Ethnic Crops of Interest; 100+ Crops

Create Initial Ethnic Crop List. An initial list of ethnic crops commonly sold/marketed and considered as ethnic produce items for each of the four ethnic groups of study was compiled based upon a combination of focus groups and identification through related research (Govindasamy, 2006).

Conduct Process of Elimination. To determine which crops from the initial list to include in the survey, a panel of twelve marketing, field/extension, and crop specialists scrutinized the list of ethnic crops to eliminate those with existing production barriers that could impede their local production and/or marketplace success. Production barriers included local climate limitations, growth cycle (relatively short cycle necessary to grow in designated East Coast production sites), lack of seed supply due to regulatory issues, and local competition and/or commodity nature of certain produce items. Thus, specialty crops with short post-harvest life were given priority over commodity and less-perishable crops such as beans and certain peppers used primarily as spices.

This process reduced the survey crop candidate list to 42 crops (10 each for Asian Indian, Mexican, and Puerto Rican, and 12 for Chinese) to assess demand. Due to budgetary constraints, the list required further reductions to arrive at a final list of approximately 28 crops (targeting roughly 7 per ethnicity) to be included in subsequent production research. Assessment of the survey results, along with additional production evaluation for each, was conducted to achieve program goals.

4.2. Assess Demand and Supply/Production Potential; 42 crops

Rank Crops by Ethnicity. Results of the survey of 271 randomly selected East Coast consumers from each of the four ethnic groups were used to rank the crops included in the questionnaire, within ethnicity, according to expenditure and/or purchase data. Multiple criteria were established to rank produce items according to: (1) mean (weekly) expenditures across all respondents (including zero purchases); (2) mean (weekly) expenditures across only respondents purchasing that item (excluding zero purchases); (3) frequency of purchase across respondents (binary; 1 or 0 for purchase or non-purchase, respectively), (4) volume (number of pounds, bunches, or units) purchased by each respondent for each produce item; and (5) overall rank (average of results rankings #1 thru #4) for each produce item.

In addition to assessment of the survey demand, crops were also evaluated for production research potential (research interest, yield potential, and anticipated cost effectiveness) by field study participants at each site.

A combined assessment (actual survey demand and estimated production potential) was particularly important in cases where a single systematic demand approach was not sufficient to distinguish between crops for research prioritization purposes.

4.3. Prioritize Production Research; 28 Crops

Re-visit Research Candidates; Examine Survey Demand Rank. The rank order according to survey respondents' purchases varied somewhat across the multiple criteria. An Overall Rank threshold of 8 (average rank higher than 7) was established to help identify crops with relatively low survey demand in an initial attempt to arrive at 28 crops (7 per ethnicity) for the final production study. Crops at or above this threshold were more closely examined based on the other four (independent) criteria. A few produce items from each ethnicity consistently ranked 8 or higher across all of the criteria, allowing for a systematic approach to eliminating crops from the research candidacy list. Crops ranked 8 or higher in *all* (5) categories were systematically removed from further production considerations. The remaining crops were further evaluated for supply-side potential and consolidated across ethnic groups to maximize production research. This process resulted in a proposed list of 28 production research crops.

Expenditure results of the Chinese consumers surveyed revealed a distinct ranking of 12 Chinese crops (Table 4.1). Five Chinese crops received an Overall Rank of 8 or higher. Four out of these five crops consistently ranked 8 or higher in each category, suggesting lower marketplace potential relative to their 1 thru 7 ranked counterparts. As such, these four crops (oriental mustard, basil, Malabar spinach, and perilla) were not considered strong candidates for further research and were removed from the candidacy list altogether.

Table 4.1. Chinese Ethnic Produce Survey Ranking

Produce	Rank Based on Criteria (weekly purchases)						
	Mean Expenditure With Zero Purchase	Mean Expenditure without Zero Purchase	Produce Purchase Frequency	Volume of Produce Bought	Average Rank	Overall Rank	Avg Exp ($)
Baby Pak Choy	1	1	2	2	1.5	1	2.26
Pak Choy	2	5	1	1	2.25	2	1.77
Oriental Eggplant	3	2	5	4	3.5	3	1.60
Oriental Spinach	5	6	4	5	5	4	1.28
Snow Peas	4	4	6	6	5	5	1.29
Napa Cabbage	7	9	3	3	5.5	6	1.04
Ridged Gourd/ Luffa	6	3	8	7	6	7	1.10
Edamame	8	7	7	9	7.75	8	0.79
Oriental Mustard	9	8	9	8	8.5	9	0.71
Basil	10	12	10	10	10.5	10	0.22
Malabar Spinach	11	10	12	12	11.25	11	0.20
Perilla	12	11	11	11	11.25	12	0.19

Results of the similarly surveyed Asian Indian consumers reveal the ranking of 10 Indian crops (Table 4.2). Three crops received an Overall Rank of 8 or higher. One of these (white pumpkin) ranked higher than 8 in every category and was removed from the candidacy list altogether.

Table 4.2. Asian Indian Ethnic Produce Survey Ranking

Produce	Rank Based on Criteria (weekly purchases)						
	Mean Expenditure With Zero Purchase	Mean Expenditure without Zero Purchase	Produce Purchase Frequency	Volume of Produce Bought	Average Rank	Overall Rank	Avg Expen-diture $
Bitter Gourd	1	2	3	2	2	1	2.48
Eggplant	2	6	1	1	2.5	2	2.23
Fenugreek Leaves	3	8	2	3	4	3	1.48
Cluster Beans	4	3	6	5	4.5	4	1.33
Bottle Gourd	5	7	5	4	5.25	5	1.31
Mustard Leaves	6	1	8	7	5.5	6	1.06
Ridge Gourd	7	5	7	6	6.25	7	0.94
Mint Leaves	8	10	4	8	7.5	8	0.68
Amaranth	9	4	10	10	8.25	9	0.61
White Pumpkin	10	9	9	9	9.25	10	0.56

Mexican crops (Table 4.3). Three crops received an Overall Rank of 8 or higher and two of these (Chili Habanero and Tutuma) consistently did so across all criteria and were removed from the candidacy list.

Table 4.3. Mexican Ethnic Produce Survey Ranking

Produce	Rank Based on Criteria (weekly purchases)						
	Mean Expenditure With Zero Purchase	Mean Expenditure without Zero Purchase	Produce Purchase Frequency	Volume of Produce Bought	Average Rank	Overall Rank	Avg Expen-diture $
Chili Jalapeno	1	3	2	1	1.75	1	2.76
Tamatillo	2	4	3	2	2.75	2	1.73
Calabaza	3	2	4	4	3.25	3	1.49
Chili Poblano	5	1	6	6	4.5	4	1.28
Calabacita	4	5	5	5	4.75	5	1.28
Cilantro	6	10	1	3	5	6	1.24
Chili Serrano	7	7	7	7	7	7	0.92
Anaheim Pepper	8	6	8	8	7.5	8	0.83
Chili Habanaro	9	9	9	9	9	9	0.24
Tutuma	10	8	10	10	9.5	10	0.10

The results for surveyed Puerto Rican consumers reveal the ranking of 10 select Puerto Rican crops (Table 4.4). Three crops received an Overall Rank of 8 or higher, but none of these consistently ranked 8 or higher in all categories. As a result, none of these three crops were systematically eliminated from the candidacy list.

Table 4.4. Puerto Rican Ethnic Produce Survey Ranking

Produce	Rank Based on Criteria (weekly purchases)						
	Mean Expenditure With Zero Purchase	Mean Expenditure without Zero Purchase	Produce Purchase Frequency	Volume of Produce Bought	Average Rank	Overall Rank	Avg Expen-diture $
Batata	1	4	2	1	2	1	1.74
Aji Dulce	3	2	4	3	3	2	1.58
Cilantro	2	8	1	2	3.25	3	1.68
Calabaza	4	9	3	4	5	4	0.96
Fava Beans	6	6	6	6	6	5	0.63
Pepinillo	5	10	5	5	6.25	6	0.70
Chile Caribe	7	3	8	9	6.75	7	0.56
Berenjena	8	7	7	7	7.25	8	0.51
Calabacita	9	5	9	8	7.75	9	0.43
Verdolaga	10	1	10	10	7.75	10	0.10

Re-evaluate Survey Rank; Consider Production Potential. Once the crops that qualified for systematic elimination from production research were removed, the remaining crops were re-evaluated with consideration for production interests to either justify including them as production candidates or remove them accordingly. The analysis considered the incremental research benefits of comparisons of similar crop types and the marketplace and/or profitability potential, among other considerations.

In the case of Chinese crops, the removal of relatively low demand crops resulted in a list of production candidates with significant research potential, as relatively little historic research exists on local production of these crops.

The proposed Asian Indian production crop candidates contained three types of leaves, but the inclusion of more than two types of leaves was not warranted from a production

perspective (i.e. limited uniqueness of potential research findings associated with these two crops of similar cultural production methods relative to the other candidates in the group). The relative commodity nature of these leaves drove the decision to eliminate one of the leaf varieties. Fenugreek remained as a candidate, given it was ranked in the top three based on Overall Rank as well as three of the four individual rank criteria. A pre-existing local production interest in mint, given its additional non-food/religious demand and non-spice uses (i.e. additional marketing potential), fueled the decision to retain it as a production candidate. Consequently, mustard leaves were eliminated from production candidacy.

The Mexican production candidate list contained multiple types of peppers. Despite the limited incremental research benefits associated with an abundance of crops of similar species, there were no existing supply-side concerns which distinguished one pepper from another in terms of production preferences. Therefore, no crops were removed from the production list solely on the basis of limited (individual) production potential. Rather, the subsequent review of a combined list of peppers from both Hispanic groups of study (i.e. Mexican *and* Puerto Rican), resulted in a consolidated list with fewer pepper candidates (i.e. without duplicates or redundant 'hot' or 'sweet' types).

The Puerto Rican production candidates required further refinement, as no crops were systematically eliminated on the basis of relatively low demand. Each of the ten surveyed crops was closely scrutinized on the basis of supply and profit potential. Fava beans were considered to have relatively limited supply (profit) potential, given the relatively short season for local production and the history of limited successes by local growers who have experimented with small-scale production of this crop. As a result, fava beans were eliminated from production candidacy. The remaining crops were reviewed for duplication across the Hispanic ethnic groups (i.e. along with the Mexican list) to arrive at a proposed production candidate list of 7 crops for each group.

Consolidate/Maximize Across Ethnicities. Additional deletions were made to the remaining crop lists for each ethnicity to eliminate duplication across ethnic groups and

maximize production research efforts. This consolidation of candidates from the four ethnic lists resulted in a combined list of 28 unique crop candidates and was conducted in a manner that balanced 7 crops per ethnic group (by design, such that survey rank was not a factor in the manner, or order, in which duplicates were removed from a particular ethnic group, as both groups stand to benefit from subsequent production research). Specifically, the following additional eliminations of crops were made;

- Ridged gourd/luffa was removed from the Chinese list (duplicate of Indian list)
- Bitter gourd was removed from the Asian Indian list (duplicate of pepinillo on the Puerto Rican list)
- Cilantro was removed from the Mexican list (duplicate of Puerto Rican list)
- Calabaza and calabacita were removed from the Puerto Rican list (duplicates of Mexican list)

Re-prioritize Crops for Production. The result of the production research prioritization process based upon primarily survey demand, combined with production considerations, yielded the targeted list of 28 (of 42) crops recommended for production trials (Table 4.5).

Table 4.5. Prioritization Process; Proposed Production Crops

Crop Candidates Survey Demand; Overall Rank	Re-visit Candidacy Eliminate if Rank ≥ 8; for All (5) Survey Criteria	Re-Evaluate Rank Consider Production Potential	Consolidate/Maximize Across Ethnic Groups; Remove Duplicates	Re-Prioritize Select 28 Crops
Chinese				
1 Baby Pak Choy				Baby Pak Choy
2 Pak Choy				Pak Choy
3 Oriental Eggplant				Oriental Eggplant
4 Oriental Spinach				Oriental Spinach
5 Snow Peas				Snow Peas
6 Napa Cabbage				Napa Cabbage
7 Ridged Gourd/Luffa			*Remove (Indian duplicate)*	
8 Edamame				Edamame
9 Oriental Mustard	*Remove*			
10 Basil	*Remove*			
11 Malabar Spinach	*Remove*			
12 Perilla	*Remove*			
Asian Indian				
1 Bitter Gourd			*Remove (Puerto Rican duplicate)*	
2 Eggplant				Eggplant
3 Fenugreek Leaves				Fenugreek Leaves
4 Cluster Beans				Cluster Beans
5 Bottle Gourd				Bottle Gourd
6 Mustard Leaves		*Remove*		
7 Ridged Gourd				Ridged Gourd
8 Mint Leaves				Mint Leaves
9 Amaranth				Amaranth
10 White Pumpkin	*Remove*			
Mexican				
1 Chili Jalapeno				Chili Jalapeno
2 Tomatillo				Tomatillo
3 Calabaza				Calabaza
4 Chili Poblano				Chili Poblano
5 Calabacita				Calabacita
6 Cilantro			*Remove (Puerto Rican duplicate)*	
7 Chili Serrano				Chili Serrano
8 Anaheim Pepper				Anaheim Pepper
9 Chili Habanero	*Remove*			
10 Tutuma	*Remove*			
Puerto Rican				
1 Batata				Batata
2 Aji Dulce				Aji Dulce
3 Cilantro				Cilantro
4 Calabaza			*Remove (Mexican Duplicate)*	
5 Fava Beans		*Remove*		
6 Pepinillo (bitter gourd)				Pepinillo (bitter gourd)
7 Chili Caribe				Chili Caribe
8 Berenjena (eggplant)				Berenjena (eggplant)
9 Calabacita			*Remove (Mexican Duplicate)*	
10 Verdolaga				Verdolaga
42 Crops	**-7**	**-2**	**-5**	**28 Crops**

This re-prioritized list contained four species that had significant cross-ethnicity demand that were deemed high production research priorities as a result. Specifically, the four species, ethnic groups consuming them, and corresponding crops in this list were as follows:

Cucurbits (Cucurbita)

Cucurbits were in demand by all four ethnic groups of study. A total of five unique cucurbits were included in the consumer survey. These were categorized into two cultural production types, trellised vs.non-trellised, for production plot planning purposes. The two trellised cucurbits included luffa (ridged gourd, in demand by both Asian groups) and bitter melon (bitter gourd/pepinillo in demand by Asian Indians and Puerto Ricans, respectively). There were three non-trellised: bottle gourd (in demand by Asian Indians), calabaza squash (Hispanic winter squash), and zucchini (calabacita; Hispanic summer squash).

Eggplant (Solanum)

Eggplants were in demand by three groups (Chinese/Asian Indian/Puerto Rican). Three types of eggplant were included in the candidate list (Oriental eggplant var. Orient Express, Asian Indian eggplant var. Raavayya variety and Berenjena/Dominican eggplant).

Chili/Peppers (Capsicum)

Peppers were in demand by two groups (Mexican/Puerto Rican). A total of six types of pepper were included in the candidate list (chili jalapeno, chili poblano, chili Serrano, chili caribe, aji dulce, and Anaheim pepper).

Coriander (Coriandrum)

Coriander/cilantro, in demand by two groups (Mexican/Puerto Rican), was included in the candidate list.

4.4. Develop Production Plot Plans; 12 Research and 16 Demo Crops

Identify Top Priority Crops for Replicated Trials. Logistical concerns (space, labor and budget constraints) drove decisions to limit the number of replicated crops to twelve and include crops of similar species suited for production on black plastic mulch with drip irrigation systems. Species with cross-ethnic demand were given higher priority for replication to maximize the return on research efforts. Fifteen crops on the list had cross-ethnic demand.

Coriander/cilantro was the only crop with cross-ethnic demand that did not have two or more types to compare, and along with the Chinese greens, is already grown extensively by New Jersey and Florida growers. Ultimately, because cilantro and the Chinese greens are usually grown in bare-ground, wide beds with overhead irrigation, these crops were placed in demonstration plots rather than being replicated. Four cucurbits, three eggplants, and two Capsicum peppers with cross-ethnic demand would be replicated.

Cucurbits. Lack of seed availability drove the final decisions of which (four) cucurbits to include in the replicated plots. Appropriate seeds for calabaza and calabacita were not found in time for the production trial season. Calabacita was shifted from a replicated to a demonstration plot plan since a true seed for this variety was not obtained and another zucchini variety was substituted. There was no available seed substitute for calabaza so it was replaced by a second luffa (smooth luffa; in addition to the ridged gourd/luffa) to allow for luffa comparisons. The remaining cucurbits, bitter gourd and bottle gourd, were included the replicated trials.

Eggplants. Appropriate seeds for berenjena (Dominican eggplant) were also not secured in time for trials. Another Asian Indian eggplant variety (Bharta) was substituted and entered into replicated trials, along with the Oriental eggplant and Raavayya variety.

Peppers. The number of *Capsicum* peppers to be replicated was reduced from six varieties to two due to the lateness of obtaining seed. Qnly the pepper types with the highest overall survey demand rank from each of the Mexican and Puerto Rican lists

were included (chili jalapeno and *aji dulce*, respectively) representing one hot and one sweet variety.

Additional High-Demand Crops. Despite not using the most appropriate production system for them, the crops with the highest overall survey demand/rank from each of the Chinese, Mexican, and Puerto Rican groups were added to the replicated plots (the highest ranked crop from the Asian Indian list was already included) to ensure that the crops with the highest demand from each list were included, once the cross-ethnic list had been exhausted. These three additional crops completed the list of twelve crops to be included in replicated trials.

Develop research and demonstration crop plot plans. A recommended plot plan, inclusive of twelve replicated crops and sixteen demonstration crops (ten specified crops, with additional space for six 'cooperator's choice' crops), was developed to permit the statistical inclusion of data across locations for comparative analyses. It also allowed field participants at each site to research crops and/or varieties that might be particularly relevant in their local area.

A process of elimination was used to arrive at ten crops to be included in demonstration trials at all sites. The same underlying factors that supported the decisions for replicated trial selections also contributed to this process: incremental research benefits, seed availability, and survey demand. Seed/plant availability was the limiting factor for several of the pepper types and cluster beans as appropriate varieties were not found in time for the production trial season. Amaranth and verdolaga were excluded due to low demand relative to the remaining proposed production crops (illustrated in Table 4.2 and Table 4.4, respectively). The remaining ten proposed crops were selected for demonstration plots at every site along with the twelve previously identified replicated crops (Table 4.6).

Table 4.6. Selected Crops for Production Plots (by Ethnic Group; Research vs. Demonstration)

Ethnic Group	Plot Type	Ethnic Crop Name	Scientific Name
Chinese	Research	Baby Pak Choy	*Brassica rapa* L. ssp *chinensis*
		Oriental Eggplant	*Solanum melongena* L.
		Smooth Luffa	*Luffa aegyptiaca* Mill. (or *L. cylindrica* (L) M. Roemer)
	Demo	Edamame	*Glycine max* (L.) Merr.
		Napa Cabbage	*Brassica rapa* L. ssp *chinensis*
		Oriental Spinach	*Spinacia oleracea* L.
		Pak Choy	*Brassica rapa* L. ssp *chinensis*
		Snow Peas	*Pisum sativum* L. var. *macrocarpon*
Asian Indian	Research	Bottle Gourd	*Lagenaria siceraria* (Mol.) Standl.
		Eggplant (Raavayya)	*Solanum melongena* L. var. Raavayya
		Eggplant (Bharta)	*Solanum melongena* L. var. Bharta
		Ridged Gourd	*Luffa acutangular* (L.) Roxb.
	Demo	Fenugreek Leaves	*Trigonella foenum-graecum* L.
		Mint Leaves (Spearmint)	*Mentha spicata* L.
Mexican	Research	Chili Jalapeno	*Capsicum anuum* L.
		Tomatillo	*Physalis philadelphica* Lam. (or *P. ixocarpa* Brot.)
	Demo	Calabacita	*Cucurbita pepo L.*
		Chili Pablano/Ancho	*Capsicum anuum* L.
Puerto Rican	Research	Aji Dulce	*Capsicum chinense* Jacq
		Batata	*Ipomoea batatas* (L.) Lam.
		Pepinillo/Bitter gourd	*Momordica charantia* L.
	Demo	Cilantro/Coriander	*Coriandrum sativum* L.

5. ETHNIC CROP PRODUCTION AND RESEARCH PROGRAM

After completing the first phase of the ethnic produce project related to consumer survey results, the second phase focused on food crop production research and demonstration. The four primary objectives of this phase were to;

1) establish a common set of field demonstration and research plots in each collaborating state;
2) demonstrate and evaluate a variety of ethnic crops grown at each site;
3) conduct case-studies of specialty-ethnic produce growers; and
4) communicate ethnic crop production information to advisors and growers via presentations, tours, websites, fact sheets, articles, and other forms of informational literature.

5.1. Production Trials

Trial Locations and Evaluation Parameters. For the 2006/07 trials, demonstration and research crops, selected as previously described, were to be established at six sites located in three states along the East Coast: two in Florida, one in Massachusetts, and three in New Jersey.

Crop quality and yield parameters were developed in order to make recommendations for geographic sequencing of production, by month/season, to sustain a twelve month production supply in the eastern United States.

Summer 2006 demonstration and research trials were established in Massachusetts and New Jersey on research farms. Commercially available cultivars of the selected crops were grown following standard commercial production practices in a randomized plot design including one replication of demonstration crops and 3 to 4 replications of research crops at each site. Crop quality and yield parameters were measured and will be evaluated statistically to determine suitability for commercial production. Special

attention will be paid to variations in yield and quality of produce as may be affected by season and geographic location. Winter production intended to begin in Florida in early-2007 has been postponed to consider redesigning the research plots to obtain more useful information. Within the limitations of the grant, the trials will be conducted at each location for two seasons.

5.2. Case Studies

Cooperating growers of specialty and/or ethnic crops will be identified in each collaborator's area. One or two will be selected to participate in a full-farm case study of their business. The case study analysis will compare farm size, number of crops and rotations, primary market(s) and selling methods, gross income, amount of labor used, and the owner's perceptions of ethnic crop markets in order to ascertain barriers to and opportunities for production and marketing of ethnic produce.

5.3. Outreach

Results of the production trials and case studies will be presented at appropriate professional and trade conferences, included in journal and trade publications, and through media outreach to growers and ethnic consumers. Professional and trade conference affiliations to-date include presentations and corresponding papers in associated proceedings at the American Society of Horticultural Sciences National Conference, the New Crops and New Uses 6th Annual Symposium, and numerous extension meetings and trade shows throughout the East Coast (e.g. SC, PA, NJ, DE, NY). PowerPoint presentations and posters have been developed for outreach to local vegetable growers to communicate information from these ethnic crop studies providing them with demand assessments in order to a adopt market-first approach to crop production. These outreach tools provide graphical consumer data, identify specific ethnic crops with significant ethnic consumer demand, and promote alternative/niche marketing.

6. CONCLUSIONS AND RECOMMENDATIONS FOR FURTHER RESEARCH

The approach outlined in this paper uses a detailed market driven assessment and then custom tailors field production research and supportive applied studies to bolster and drive the market study. Such a model is often discussed but rarely practiced. The approach described provides a model to bridge the gap between consumer, distributors and growers. This strategic approach to new crop introduction provides the needed research support to commercial growers linking the production research to specific consumer demands. Information from the production trials will be combined with case study findings to make final crop recommendations and communicated accordingly to East Coast farmers. Completion of the second phase of the study is targeted for 2009 to accommodate the postponed Florida trials and still allow for two seasons in all three states of study.

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Appendix: Ethnic Consumer Survey Questionnaire

Ethnic Produce Consumer Survey

Hello, I am calling on behalf of Rutgers University and the United States Department of Agriculture. <Language and ethnicity determination> We are conducting a survey to understand the trends in Ethnic consumers' fruits and vegetable purchases.

- *May I speak with the principal grocery shopper in your household?*

"N/A": *"Is there a time when he/she will most likely be available?"* **<Record and re-attempt>**

"No": *"Thank you and have a pleasant day/evening"* **<Terminate call>**

<New interviewee>: **Repeat above then continue below**

<Currently speaking>: **Continue with,** *"Then please be aware that…"*

Your responses will remain anonymous. The information you provide will not be linked to you personally, but rather, will be combined with the responses of the other individuals that participate in the survey. Your voluntary participation will assist in the assessment and response to <Asian Indian/Chinese/Mexican/Puerto Rican> consumer trends and preferences.

It will take approximately five to ten minutes to complete this survey. May I proceed with asking you some questions about your fruits and vegetable purchases? Y/N

"Yes": **Proceed to questionnaire**

"No": *"Thank you and have a pleasant evening"* **<Terminate call>**

1a. *Have you purchased any <Ethnic group> fresh fruits or vegetables over the past 12 months?*

1.☐ Yes 2.☐ No

"Yes": **Proceed to question #2**

"No": **Follow-up with question 1b;**

1b. *What are your reasons for NOT purchasing? Please provide all reasons that contribute to your decision NOT to purchase.* **<If necessary, prompt/code all that apply>**

1.☐ *Do not like <Ethnic group> produce* 4.☐ *Closest ethnic outlet is too far*

2.☐ *Lack of availability in American store* 5.☐ *No ethnic store/outlet available*

3.☐ *Poor selection in American store* 6.☐ Other <*"Please specify"*>_____

Go to question #12, record response, and close with *"Since you have not purchased <Ethnic group> fresh fruits or vegetables over the past 12 months, that completes our survey. Thank you for your valued participation in this study."*

2. *Over the course of the year, how often do you typically purchase <Ethnic group> fruits and vegetables within a month?* XXXX times/visits

3. *On average, how much do you spend on <Ethnic group> fruits & vegetables per visit?* $XXX.XX

4. *On average, how much do you spend for all of your fruits & vegetables, in a month?* $XXX.XX

5. *Where do you tend to buy <Ethnic group> fruits & vegetable during the course of the year? Please indicate all places, even if only available seasonally, from the following:*

<Code all that apply>

1.☐ *Typical American grocery stores*
2.☐ *Ethnic grocery stores*
3.☐ *Community farmers' market*
4.☐ *On-farm markets or roadside stands*
5.☐ Other *<"Please specify">*_____

6. *What portion of your <Ethnic group> fruits & vegetables are purchased at typical American grocery stores? Would you say, "ALL, MOST, SOME, or NONE"?*

<If necessary, provide examples of *"American grocery stores" such as; "A&P, Albertsons/ACME, Food Lion, Foodtown, Piggly Wiggly, Sam's Club/Walmart, and Wegmans"* **>**

1. ☐ All 2.☐ Most 3.☐ Some 4.☐ None

7. *How close to your home is the nearest <Ethnic group> grocery store or market?* XXXX miles

<If necessary, encourage to approximate, or code:>

☐ Not aware of such a store w/in 60 miles

8. *I am now going to read you, in your language of origin, the names of some <Ethnic group> fruits and vegetables. I will ask you for the quantity that you buy per week and the typical price that you pay for the item, regardless of where you purchase.*

<Respondent purchase data is to be collected and recorded, by produce item, as follows;
Read first name listed for item. List alternate names, as needed, until respondent recognizes item.
If necessary, prompt with *"pounds, bunches, or numbers"***. Code response accordingly.**
If necessary, prompt with *"either price per unit OR total purchase cost"***. Code as appropriate; only one of the two (price or purchase cost) need be recorded, as it will be used to estimate the other.>**

No:	Name	Quantity/Week	Price/Unit	Total Purchase Cost
1		Lbs/bunch/numbers		
2		Lbs/bunch/numbers		
3		Lbs/bunch/numbers		
4		Lbs/bunch/numbers		
5		Lbs/bunch/numbers		
6		Lbs/bunch/numbers		
7		Lbs/bunch/numbers		
8		Lbs/bunch/numbers		
9		Lbs/bunch/numbers		
10		Lbs/bunch/numbers		

I am going to read to you a list of attributes, and ask you to rate the importance of each in terms of your decision to shop for and purchase <Ethnic group> fruits and vegetables.

9. *Please respond to each of the following with whether the attribute is "VERY, SOMEWHAT, or NOT" important:* **<If necessary, repeat categories and/or define attribute as indicated>**

	Very important	***Somewhat***	***Not***	**Unsure**
a) *Store Availability (Location/Season)*	1.☐	2.☐	3.☐	4.☐
b) *Language (Spoken/Understood/Labels/Ads)*	1.☐	2.☐	3.☐	4.☐
And specifically, in terms of the fruits and vegetables:				
c) *Selection (Variety/Origin)*	1.☐	2.☐	3.☐	4.☐
d) *Freshness (Ripeness/Maturity)*	1.☐	2.☐	3.☐	4.☐
e) *Quality (Taste/Nutrition/Shelf-life)*	1.☐	2.☐	3.☐	4.☐
f) *Price (per relative unit)*	1.☐	2.☐	3.☐	4.☐
g) *Packaging (Type or pack size/units)*	1.☐	2.☐	3.☐	4.☐
h) Other *<"Please specify">*:_____	1.☐	2.☐		

Now I will read you a few of those same attributes, and ask you to compare <Ethnic group> outlets to typical American or conventional establishments, based on each attribute.

10. *Please respond to the following with whether you find the <Ethnic group> outlets to be "BETTER, the SAME, or WORSE" than the conventional establishments, in terms of their fruits and vegetables:* **<If necessary, repeat categories and/or define as in #9 and below>**

	Better	***Same***	***Worse***	**Unsure**
a) *Selection is*	1.☐	2.☐	3.☐	4.☐
b) *Freshness is*	1.☐	2.☐	3.☐	4.☐
c) *Quality is (Includes packaging)*	1.☐	2.☐	3.☐	4.☐
d) *Price is*	1.☐	2.☐	3.☐	4.☐
e) *Packaging (Type or pack size/units)*	1.☐	2.☐	3.☐	4.☐
f) Other *<"Please specify">*:_____	1.☐	2.☐	3.☐	4.☐

11. *Are you willing to pay more for <Ethnic group> fruits and vegetables than the comparable American or conventional substitutes, and if so, what percent more?* XXXX percent **("No" =0)**

<If necessary, prompt with, *"Would you say approximately 5, 10, 15, 20%, or more than 20%?"***>**

12. *If made available to you, would you be "MORE willing to buy, INDIFFERENT to, or LESS willing to buy" <Ethnic group> fruits and vegetables that are:*

<If necessary, repeat answer choices:>

	More willing	***Indifferent***	***Less willing***	**Unsure**
a) *Sold in <Ethnic group> outlets*	1.☐	2.☐	3.☐	4.☐
b) *Grown on local farms*	1.☐	2.☐	3.☐	4.☐
c) *Organically grown*	1.☐	2.☐	3.☐	4.☐
d) *Genetically modified*	1.☐	2.☐	3.☐	4.☐
d) *Labeled according to country of origin*	1.☐	2.☐	3.☐	4.☐
e) *Recently introduced or new to market*	1.☐	2.☐	3.☐	4.☐

13. *Which types of advertisements would influence your decision to purchase <Ethnic group> fruits & vegetables? Please indicate all types, even if not currently available, from the following:* **<Code all categories that apply, after providing examples listed>**

1.☐ *Out-of-store ads (media including radio, TV, newspaper, and on-line)*
2.☐ *Visible-from-road ads (such as billboards and on-farm or roadside stands promotions)*
3.☐ *On-site or in-store ads (displays, demos, brochures, posters/banners, or announcements)*
4.☐ *Point-of-purchase ads (price cards/tags or produce identification; labels/stickers)*
5.☐ None
6.☐ Other *<"Please specify">*_____

14. *Do you grow <Ethnic group> fruits or vegetables for consumption at home?*
1.☐ Yes 2.☐ No

15. *Are you a vegetarian?*
1.☐ Yes 2.☐ No

The following information concerning you and your household are necessary for classification purpose. Again, your answers will be kept strictly confidential and used only to help us interpret the aggregate survey results.

16. *Is your neighborhood URBAN, SUBURBAN, or RURAL?*

1.☐ Urban 2.☐ Suburban 3.☐ Rural

17. *How many years have you been living in <City, State>?* XXXX years

18. *Including yourself, how many people are in your household?* XXXX people

19. *How many of the people in your household are age 17 or less?* XXXX people

20. *Which of the following ranges includes your age:* **<Read options>**

1.☐ *Less than 20*
2.☐ *21 to 35*
3.☐ *36 to 50*
4.☐ *51 to 65*
5.☐ *Over 65*

21. *What is the highest level of education equivalent that you have completed:* **<Read options>**

1.☐ *Less than 12th grade*
2.☐ *High school graduate*
3.☐ *2 year college degree*
3.☐ *4 year college degree*
4.☐ *Post graduate or advanced degree*

22. Which of the following best describes your current occupation? **<Read options>**

1.☐ *Employed by someone else*
2.☐ Self-employed
3.☐ *Retired*
4.☐ *Full-time Homemaker*
5.☐ *Unemployed*
6.☐ Other *<"Please specify">*:_____

23. *Which of the following ranges includes the annual-income of your household before taxes:*

1.☐ Less than $20,000
2.☐ $20,000 to $39,999
3.☐ $40,000 to $59,999
4.☐ $60,000 to $79,999
5.☐ $80,000 to $99,999
6.☐ $100,000 to $124,999
7.☐ $125,000 to $149,999
8.☐ $150,000 to $199,999
9.☐ $200,000 or more

24. *Which of the following best describes your current marital status?* **<Read options>**

1.☐ Married
2.☐ Single
3.☐ Divorced
4.☐ Separated
5.☐ Widower
6.☐ Other *<"Please specify">*:_____

25. **<Code based on interviewer's determination>**
1.☐ Female
2.☐ Male

26. *Do you speak your ethnic language?* **<If necessary, prompt to answer with** *"Yes" or "No"***>**

1.☐ Yes
2.☐ No
3.☐ Somewhat/very little **<Only if indecisive>**

27. *Where were you born?*

1.☐ *U.S.*
2.☐ *<Country of Ethnic origin>*
3.☐ *Other (please specify)*:_____

"US": **(Skip question #28) Read final statements and then terminate call**
<Country of Ethnic origin> or *"Other"*: **proceed to question #28**

28. *How old were you when you arrived in the US?* XXXX Years

Our survey is now complete. Thank you for your valued participation in this study.

<If necessary at any time during the survey, provide project sponsor information and contacts below:>

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