

SUPPORTING STATEMENT

Generic Testing – Baltimore Urban Agriculture Study

OMB No. 0535-0248

This mini-supporting statement is being submitted to OMB to define the need for conducting the 2015 Urban Agriculture Pilot Test.

A. JUSTIFICATION

1. Circumstances making collection of information necessary.

Urban agriculture is increasing across the US. The National Agricultural Statistics Service (NASS) has traditionally been focused on production agriculture. In contrast, agriculture in urban areas tends to be conducted in smaller areas and have less potential for sales. Yet, this trend is increasingly important for the nation's food security. The Under Secretary and Chief Scientist of USDA, Catherine Woteki, has requested that NASS explore ways to better account for this type of production.

Given that NASS already conducts the Census of Agriculture, this pilot project is designed to measure urban agriculture activities in a way that could be used to enhance Census data collection efforts. NASS has contracted with the Multi-Agency Collaboration Environment (MACE) to develop algorithms, based on high-resolution satellite imagery, public lists of urban producers, permits for urban agricultural activity, social media feeds such as Facebook and Twitter, etc., that will identify areas of potential agricultural activity within two urban areas. Baltimore is the first of the cities to be studied and is the one that is the focus of this pilot study. The MACE will provide geographical coordinates and shape files of identified areas of likely urban agriculture. A survey needs to be conducted to determine (1) whether identified areas are non-agricultural, agricultural but not a farm, or a farm (an operation that sells or has the potential to sell \$1000 or more in agricultural products during a year) and (2) the characteristics of the identified agricultural areas.

The NASS Advisory Committee on Agricultural Statistics and USDA Deputy Secretary Krysta Harden have expressed interest and concerns about the manner in which information on women and new/beginning farmers is collected and subsequently reported. Her concerns may be even more relevant for the inherently non-traditional practices of urban agriculture. In response, at the request of NASS, the National Institute of Statistical Science established an expert panel to review the current processes and to recommend changes for the 2017 and 2022 Censuses of Agriculture. The meeting was held April 2-3, 2015.

Panel-recommended revisions could first be used in the 2016 ARMS survey

and/or a follow-on survey on farm structure now in the President's FY2016 budget. This pilot study will be the first opportunity to use these revised questions within a non-traditional farm setting. It is proposed that the revised questions, as recommended by the expert panel, be used in the Urban Agriculture Pilot Study questionnaire.

2. How, by whom, and for what purpose information is to be used.

The information gathered through this testing will be used to assess the viability of the proposed approach to quantifying urban agriculture and the quality of the revised questions on women and new/beginning farmers. For the urban agriculture project, the following are the primary questions of interest:

1. In 2014, how many entities satisfied the definition of agricultural non-farms and agricultural farms in Baltimore?
2. In 2014, how many people were involved in agriculture in Baltimore?
3. In 2014, how many square feet, on average, were devoted to agriculture in Baltimore?
4. In 2014, what was the total value of production in Baltimore?

Compared to the 2012 and earlier censuses of agriculture, a major addition was made to the demographics section on the 2015 Urban Agriculture Pilot Study questionnaire. The addition (question 27) focuses on collecting information on the types of agricultural decisions each person involved with the operation makes. This question is based on early feedback from the Panel on Federal Statistics on Women and Beginning Farmers conducted in early April of this year. The panel was concerned about the use of "principal operator" (on previous Censuses of Agriculture) and whether the cultural connotations accompanying this term could lead to a bias in NASS's reporting of the roles of women and beginning farmers. Consequently, the panel suggested an emphasis on decision making. Question 27 is only a slight revision of the draft question the panel provided, with the only changes being made to tailor the wording to urban agriculture. A similar question is being considered for the 2017 Census of Agriculture, and will be tested in the upcoming 2015-2016 Census of Agriculture test (OMB 0535-0243).

Question 27 will be assessed for the quality of the information obtained. Specifically, responses to the types of decisions each individual involved with the operation made will be compared with the reported "primary operator" (question 25 on the 2015 Urban Agriculture Pilot Study questionnaire). This will provide insight into the types of decisions the person identified as the primary operator makes, as well as those decisions made by women and beginning farmers (identified by question 24h). The responses to question 27 will also be evaluated to gauge their appropriateness for the urban agriculture population by analyzing the frequency of each provided response option (yes, joint, no), as well as being left blank.

Question 27 will also be evaluated in May 2015 when nine cognitive interviews will be conducted to assess whether respondents are able to easily understand the question and to provide accurate information. Revisions in wording may be suggested after the cognitive interviews. After administering each questionnaire, enumerators will record any difficulties they encountered in administering the question. This could lead to further revisions to the question prior to the 2017 Census of Agriculture. Finally, the association between the identified principal operator and that person's involvement in decision-making activities will be explored.

The results will be compared to those collected in the 2012 Census of Agriculture to gain insight into possible under-coverage and may be used to enhance our list building activities for the 2017 Census of Agriculture.

3. Use of improved information technology.

High-resolution satellite imagery, social media, and automatic selection algorithms will be used.

4. Efforts to identify duplication.

Prior to selecting the sample, record linkage will be used to identify the potential agricultural operations that are currently on the NASS list frame. The NASS list frame is constantly updated to eliminate duplication. This process should ensure that duplication is minimal.

5. Methods to minimize burden of small businesses.

The majority of the urban agricultural operations are anticipated to be small non-farms and farms. Trained enumerators should be able to move quickly through the form, keeping the burden to a minimum.

6. Consequence if information collection were less frequent.

This is a one-time test of concept. Results may be used for future testing and possible implementation of an urban form for the Census of Agriculture. The questions on women and new/beginning farmers will be improved through testing.

7. Special circumstances.

No special circumstances are associated with this information collection.

8. Federal register notice and consultation with outside persons.

Not applicable.

9. Payments or gifts to respondents.

No payments or gifts will be given to respondents.

10. Confidentiality provided to respondents.

The same confidentiality that is applied to the Census of Agriculture will be provided to respondents.

11. Questions of a sensitive nature.

The questions on race and ethnicity on the report form comply with the OMB Standards for the Classification of Federal Data on Race and Ethnicity.

12. Hour burden and annualized costs to respondents.

A pre-survey mailing will be made to the sample of locations identified as potential agriculture using satellite imagery to inform the residents of the upcoming survey. All sample locations will be visited for in-person interviews following the mailing. The amount of data being collected is similar in length to the 2007 Census of Agriculture short form. Questions have been revised to better capture urban agriculture with extraneous information deleted. Further revisions will be made to reflect the new questions developed to quantify the participation of women and new/beginning farmers. If an enumerator is not able to contact the person associated with an agricultural area on the first visit, the enumerator will return a second time in an effort to complete the questionnaire. NASS is expecting a 70% response rate from this personal interview strategy.

	Estimated Sample Size	Estimated Responses			Non-Response			Total Burden Hours
		Resp. Count	Min./Resp.	Burden Hours	Resp. Count	Min./Resp.	Burden Hours	
Pre-Survey Mailing	300	300	2	10	0	0	0	10
In-Person Interview ^{1/}	390	273	35	159.3	117	2	3.9	163.2
Total	390	273		169.3	117			173.2

^{1/} Counts reflect the fact that when community gardens (operated by multiple persons) are selected in the sample, NASS will subsample five individual plot holders and collect data from each of them. NASS estimates 6 % of the sample (300) will be community gardens, so there will be up to 300 + (300*0.06*5) = 390 interviews.

Cost to the public for completing the questionnaire is assumed to be comparable to the hourly rate of those requesting the data. Average annual reporting time of 173.2 hours, are multiplied by \$25 per hour for a total annual cost to the public of \$4330. NASS regularly checks the Bureau of Labor Statistics' [Occupational Employment Statistics](#). Mean wage rates for bookkeepers, farm managers, and

farm supervisors are averaged to obtain the wage for the burden cost. The May, 2013, mean wage for bookkeepers is \$17.91. The mean wage for farm managers is \$35.20. The mean wage for farm supervisors is \$22.09. The mean wage of the three is \$25.07.

13. Total annual cost burden to respondents.

No capital/start-up or ongoing operation/maintenance costs are associated with this information collection.

14. Annualized costs to federal government.

The total costs for the Baltimore urban pilot study are estimated to be \$160,000. To identify potential agricultural areas using the satellite imagery, social feeds, lists, etc. is \$100,000. Costs for preparing the questionnaire, mailing the pre-survey postcard, and conducting the interviews are estimated at \$60,000. This includes expenses for NASS staff time.

15. Reasons for changes in burden.

This is a one-time pilot test and has no previous burden.

16. Tabulation, analysis, and publication plans.

No data will be published from these tests. Data are for internal use only. Answers to the four questions with measures of uncertainty will be shared with the USDA Chief Scientist and NASS personnel. Results of testing the revised questions on women and new/beginning farmers will also be shared with the USDA Deputy Secretary.

17. Request for approval of non-display of expiration date.

No request is being made for approval of non-display of the expiration date.

18. Exceptions to certification statement.

No exceptions to the certification statement are requested.

B. COLLECTION OF INFORMATION EMPLOYING STATISTICAL METHODS:

1. Respondents universe, sampling and response rate.

For the field verification survey, NASS will select 300 areas identified within the Baltimore urban area as having potential agriculture through satellite imagery, social media, lists, etc. The sampled units will correspond to areas identified through algorithms based on satellite imagery, lists of growers, permits, social

media, etc. However, the operations on the NASS list frame that responded to the 2012 Census or any survey subsequent to the census will be excluded.

To ensure geographic spread, the Baltimore urban area will be stratified into regions that are fixed, geographically comprehensive, and logistically convenient. For the sample, the number of areas selected from a region will be inversely proportional to the number within a region.

With the personal interview approach, a response rate of 70% is anticipated.

Two primary endpoints were used to establish sample size: the number of agricultural areas among those identified through satellite imagery and the mean area of the agricultural areas. Each is to be estimated within a proportion D of the parameter value with 90% confidence. A study was conducted in Chicago using manual inspection of satellite imagery. In a follow-up sample survey of the identified areas, 85% were found to be agricultural. If p is the proportion of agricultural areas among the potential areas identified as agricultural, the sample size required is

$$n = \frac{z_{\alpha}^2(1-p)}{pD^2}$$

where $z_{\alpha} = 1.28$. The sample sizes for potential values of p and $D = 0.05$ are in the table below.

D	p	n	Response-Adjusted Sample Size
0.05	0.70	281	402
	0.75	219	313
	0.80	164	235
	0.85	116	166
	0.90	73	105

The National Gardening Association conducted a survey of home and community gardening in the U.S. (see <http://www.gardenresearch.com/files/2009-Impact-of-Gardening-in-America-White-Paper.pdf>). The following information is on page 11 of that report

Food Garden Size %	
100 sq. ft. or less.....	57%
101 to 500 sq. ft.	26%
501 to 2,000 sq. ft.	12%
More than 2000 sq. ft.	6%
Average size.....	600 sq. ft.

Using that information and assuming that a mid-value for the category of greater than 2000 square feet is 3000, the standard deviation in the size of gardens is estimated to be 775, and the CV of garden size is estimated to be 1.3. The sample size required to estimate the mean size of an urban agricultural area within a proportion D of the true mean size with 90% confidence is

$$n = \left(\frac{z_{\alpha} \sigma}{D\mu} \right)^2$$

Below is a table of requisite sample sizes for estimating the mean area of an urban agricultural area within $D = 0.1$ with 90% confidence and a range of CVs.

D	CV	n	Response-Adjusted Sample Size
0.1	1.0	164	235
	1.1	198	283
	1.2	236	338
	1.3	277	396
	1.4	321	459
	1.5	369	528

A sample of size 390 with a 70% response rate would result in 273 responses. This sample size will permit the proportion of agricultural areas among those identified to be estimated within 5% with 90% confidence when $p = 0.76$. The precision will be less for smaller p and greater if p is larger. With this sample size, the mean area can be estimated within 10% of the true mean with 90% confidence when the CV is 1.1. Both of these are sufficient for the purposes of this pilot study.

For sites identified as community gardens, we will sample 5 plots from each garden, and this will increase the number of personal interviews required. From previous studies, we assume that 6% of all sites identified will be community gardens. Thus, we expect 18 of the 300 sites identified to be community gardens, which will result in additional $18 \times 5 = 90$ interviews. Assuming a 70% response rate, this will increase the expected total number of responses by 63.

2. Procedures for the collection of information.

NASS staff will conduct the data collection and analysis for the test. They will use personal interviews to collect the information

3. Ways to maximize response, information collected adequate for intended uses.

One mailing and up to two personal interview attempts will be made to collect information for each potential agricultural area in the sample to help achieve at least a 70% response rate. In addition, if a respondent is not available, an enumerator will record any agricultural activity that is visible at a selected site. This rate will be sufficient to identify issues associated with the pilot test and to make generalized statements about NASS's ability to quantify urban agriculture using these methods.

4. Test of procedures or methods.

The main focus is on whether or not the identification of urban agriculture can be automated using the set of methods outlined here. Results here will be compared to those collected during the 2012 Census of Agriculture. The census may provide some measure of the rate of "false negatives," i.e., failure to identify an agricultural area. The survey will provide a measure of the rate of "false positives," identifying a non-agricultural area as agricultural, a concern with respect to the feasibility of the approach. It is hoped that some livestock, greenhouses and warehouses can be captured through this approach, although this will be challenging using satellite imagery.

5. Individuals consulted on statistical aspects of survey.

Linda J. Young, Chief Scientist and Director of Research and Development (352-281-6469; Linda.Young@nass.usda.gov), will be the lead contact on the project. Others at NASS may be consulted as the plans are finalized.

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