

Request for Approval under the “Generic Clearance for Citizen Science and Crowdsourcing Projects” (OMB Control Number: 2080-0083)

TITLE OF INFORMATION COLLECTION:

Show Me the Honey! Contributing to a Better Understanding of Honeybee Health

PURPOSE:

The United States Environmental Protection Agency (EPA) and United States Department of Agriculture (USDA) are helping to lead a national effort to promote the health of honey bees and other pollinators. As part of this effort, we are reaching out to beekeepers to help us identify indicators of honey bee colony health.

NEED AND AUTHORITY FOR COLLECTION:

Honey bee numbers have declined significantly while the demand for insect-pollinated crops has been steadily increasing with no end in sight. In response to this potential crisis, President Obama issued a memorandum in June of 2014 instructing the EPA and the USDA to coordinate a multi-agency federal response to ensure the health of honey bees and other pollinators. In April of 2015, the US EPA and USDA released the *National Strategy on Pollinator Health*. This project is responsive to EPA commitments to the National Strategy on Pollinator Health which calls for more research and utilization of citizen scientists.

USES OF RESULTING DATA:

Data will be organized into temporal and geographic context to identify mite management trends and outcomes as they relate to Varroa mite numbers.

Honey samples will be analyzed to aid in the discovery of potential biomarkers of colony health.

DATA COLLECTION METHODS:

Participants will be asked to: (1) complete a brief apiary survey, (2) determine the Varroa mite load in a single honey bee colony, (3) report these data to the EPA, (4) provide a sample of honey to be analyzed for biomarkers of health and disease, and (5) report overwintering success of the sampled hive. Participants will also be asked to feedback on data collection and reporting procedures.

PARTICIPANT UNIVERSE:

Category of Respondent	No. of Respondents	Number of responses per respondent	Participation Time per response	Burden Hours
Participant	500	5	1 hours	2,500
Totals				2,500

AGENCY COST: The estimated annual cost to the Federal government is \$2,520.00.

50 hours at EPA cost of \$50.41/hour

STATISTICAL ANALYSIS:

We will work with duplicate samples for all analytes. The dependent variable for the study will be colony survival. Our independent variables are the candidate biomarkers described in the methods above, both are categorical. Covariates for the study include beekeeper practices (i.e. treatment-free vs. treatment). Our unit of analysis is the honey bee hive and we will perform descriptive statistics (i.e. mean, standard deviation) and logistic regression. We will not perform a power analysis (pilot study, convenience sample). Samples will not be randomized or blinded. However, we will not have hive-level survival outcome data until well-after the beekeeper submits survey data and their honey sample has been analyzed. Participating beekeepers are considered one potential source of bias because the distinction and value of being “treatment-free” is a highly contentious subject. And, it is conceivable that some beekeepers may wish to promote a particular hive management style. Our analysis requires a complete dataset (i.e. survey data and corresponding honey sample). Consequently, partial datasets will not be included in the analysis. Outliers will be detected using box plots and, if one is suspected, the analysis will be repeated with and without the suspect datum to determine if it is driving the outcome. Since this is a pilot study, we do not know the limits of detection for any candidate biomarker. Finally, multiple comparisons will not be performed (pilot study, convenience sample).

DATA QUALITY ASSESSMENT PROCEDURES:

The *Show Me the Honey* data collection has several built in quality assurance elements including, only one honey bee hive per registered participant, access to training materials, obligatory screen progression (i.e. cannot move to next section until current section has been completed), submission of pictures of counted mites, automated date/time reporting and automated mathematical calculations. These measures are intended to increase the completeness of the citizen scientist provided dataset and to also assure the integrity of that dataset.

QC control requirement will consist of the following: inclusion of appropriate negative (blanks), positive controls (recombinant protein, commercially-sourced substances), routine performance checks performed on all equipment used, fresh stock solutions will be prepared for each day of dosing, measurements will be made in duplicate (minimally) adhering to appropriate standard operating procedures, adhering to NHEERL quality assurance guidelines for note booking and data storage.

ADMINISTRATION OF THE INSTRUMENT: (Check all that apply)

Web-based or Social Media

Mail

Telephone

Other, Explain

In-person

Currently the project is using paper and mail-based instrument, but in the future is likely to move to a web-based instrument or app.

INSTRUMENT: Append a copy of the questionnaire or a screen shot of the website or app that includes the information collection.

See instrument attached.

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