Plan Overview

A Data Management Plan created using DMPTool

DMP ID: https://doi.org/10.48321/D183F07059

Title: Small and Medium-Sized Farms

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Data Manager: James T. Anderson

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Funding opportunity number: USDA-NIFA-AFRI-010453

Grant: https://grants.gov/search-results-detail/351526

Template: USDA-NIFA: National Institute of Food and Agriculture

Project abstract:

This proposed research project will investigate three hemp plant cultivation methods utilized in the agricultural production of hemp. By studying the characteristics of the plant growth states, the growth progress and health of the study plant samples cultivated in (1) organic manmade soil, (2) hydroponics, and (3) aquaponics growth mediums, this project will be focused on identifying, and problem-solving risk factors detrimental to healthy plant growth in each of the three experimental growth mediums. Problem-solving will include identifying any plant soil risk factors, climate variability challenges, and assessing the need for pest and rodent control during stages of the growth process.

The proposed project has three major aims: (1) to identify the most effective outcome among the three growth methods, assisted with an organic peat and vermiculite mixture for supporting and/or creating plant resistance to pests, fungi, and algae; (2) to explore how the three growth mediums, enriched with nutrient compounds, differentially affect plant health; and (3) to explore if and how controlled environmental variables such as wind, temperature, humidity, and light conditions for each growth medium affect plant growth characteristics such as differences in stalk size, leaf color, bud size and plant yield.
The assessment of indoor hemp plant growth, utilizing hydroponics, aquaponics and organically prepared soil as growth mediums and methods, is a primary and important focus of this proposed project.

**Start date:** 11-01-2024

**End date:** 11-01-2029

**Last modified:** 08-14-2024

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Small and Medium-Sized Farms

Expected Data Type

Describe the type of data (e.g. digital, non-digital), how it will be generated, and whether the data are primary or metadata.

- Research examples include: lab work, field work and surveys.
- Education examples include: number of students enrolled/participated, degrees granted, curriculum, and training products.
- Extension examples include: outreach materials, number of stakeholders reached, number of activities, and assessment questionnaires.

Both digital and non-digital data types will be utilized for this study. Digital data (pictures of the specific stages of the growth process of the plant product) will be captured with a digital camera. Non-digital data will be collected with a questionnaire that includes observational questions that provide descriptions about the qualities and stages of growth of the plant and its sustainability in a growth environment utilizing aquaculture and hydroponics. The non-digital (paper) questionnaire will be utilized to identify and/or describe characteristics of the digital data photographs to identify the positive desirable growth characteristics. The non-digital questionnaire will include metadata and the digital photographs of the plant product are the primary data in the study.

If lab testing is necessary, it will be managed by a certified laboratory that specializes in testing contaminants, diseases, THC and CBD content and bioaccumulation. VDAC has provided a list of certified labs however, outside labs will also be utilized for testing the product. Sample testing and procedural safety standards will be monitored and managed by a trained cultivation specialist.

An undergraduate student (listed as a cultivation specialist in budget justification) will be enrolled in this study as a research laboratory intern and will work directly with the Project Director. The undergraduate student has an associate degree in Engineering and is planning to complete his bachelor's degree in Agriculture. The student has been an active participant in various greenhouse projects with the project manager for approximately 2 years. He has participated in data collection relating to well water quality, pest control, plant production and other related projects as assigned. The student also has been managing and adjusting a ventilation system to include air circulation with automated fan systems, humidifier and dehumidifier controls and VPD (Vapor Pressure Deficit) measurements. For the proposed summer laboratory internship experience, the student will be assigned a new project to study plant growth sustainability in an environment utilizing aquaculture and hydroponics.

Data Format

For scientific data to be readily accessible and usable it is critical to use an appropriate community-recognized standard and machine readable formats when they exist. If the data will be managed in domain-specific workspaces or submitted to public databases, indicate that their required formats will be followed. Regardless of the format used, the data set must contain enough information to allow independent use (understand, validate and use) of the data.

The preference is to utilize the established USDA data management systems to house and store data. A back-up copy of the data will be housed on an external hard drive in a secure location at "The Major Life" main office. All data will be saved as excel files, pdf and other file formats depending on the type of analysis required.

Data Storage and Preservation
Data must be stored in a safe environment with adequate measures taken for its long-term preservation. Applicants must describe plans for storing and preserving their data during and after the project and specify the data repositories, if they exist. Databases or data repositories for long-term preservation may be the same that are used to provide Data Sharing and Public Access. Estimate how much data will be preserved and state the planned retention period. Include any strategies, tools, and contingency plans that will be used to avoid data loss, degradation, or damage.

Data housing, preservation and sharing will be determined as the project progresses, and will be based on the growth and the quality of the product. This researcher’s preference is to use USDA data management systems to house, store and preserve primary data. Consequently, all original data will be stored on the USDA Data Management system based on the USDA Data Management system based on the system’s storage guidelines. Back-up data will be stored and preserved for 10 years after the project has ended. The back-up data will be stored in a locked file cabinet on an external hard drive located in the "The Major Life" office.

Data Sharing and Public Access

Describe your data access and sharing procedures during and after the grant. Name specific repositories and catalogs as appropriate. Include a statement, when applicable, of plans to protect confidentiality, personal privacy, proprietary interests, business confidential information, and intellectual property rights. Outline any restrictions such as copyright, confidentiality, patent, appropriate credit, disclaimers, or conditions for use of the data by other parties.

All data sets will be stored with any identifiable information retracted. All original data will be housed according to the USDA Data Management System. All back-up data will be stored on an external hard drive that will be locked in a file cabinet at "The Major Life" office for a period of 10 years after project has ended.

Roles and Responsibilities

Who will ensure DMP implementation? This is particularly important for multi-investigator and multi-institutional projects. Provide a contingency plan in case key personnel leave the project. Also, what resources will be needed for the DMP? If funds are needed, have they been added to the budget request and budget narrative? Projects must budget sufficient resources to develop and implement the proposed DMP.

The PI, Pamela Major-Harding will be responsible for DMP implementation. The back-up implementation personnel will be the Co-PI, James T. Anderson. A contingent back-up will be Marsylia Major, a family member, who has an associates degree in horticulture. Funds are needed and have been added to the budget justification and budget narrative, titled AG data common fees.
Planned Research Outputs

**Software - "Small and Medium-Sized Farms"**

This researcher anticipates that controlled environmental variables such as wind, temperature, humidity, and light conditions for each growth medium may have a positive outcome on plant cultivation such as observable and measurable differences in stalk size, leaf color, bud size and plant yield.

This researcher also anticipates that the hemp biomass can be useful in creating oils, fibers, building materials, paper, textiles and more.

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**Planned research output details**

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