Awards issued prior to January 20, 2025, were funded under previous Administrations and may not reflect the priorities and policies of the current Administration.

United States Department of Agriculture
Project Initiation

Project Data for Accession Number 1026134

Project Title

Sustainable Practices, Economic Contributions, Consumer Behavior, and Labor Management in the U.S. Environmental Horticulture Industry

Project Details

Sponsoring Institution National Institute of Food and Agriculture	**Project Status** COMPLETE
Funding Source NIFA Formula	**Grant Year** 2021
Grant No.	**Cumulative Award Amt.** N/A
Proposal No.	**Multistate No.** S1087
Project Start Date Mar 22, 2021	**Project End Date** Sep 30, 2025
Program Code	

Project Director

Hall, C.

Recipient Organization

SAES - TEXAS A&M UNIVERSITY

MS 2147

COLLEGE STATION, TEXAS 77843-2147

Performing Department

Horticultural Science

Non Technical Summary

Project SummaryThis multi-state project will conduct applied research and outreach education in support of improved production, management and marketing practices in the U.S. environmental horticulture or "green" industry. The project encompasses four broad objectives:Investigate environmental, social, and economically sustainable practices in ornamental crop production and landscape systemsEvaluate structural economic characteristics and economic contributions of the U.S. green industry to the national and state economies of the United States.Evaluate consumer preferences for environmental plants and related horticultural products, and their contribution to health and well-being. Investigate labor management practices and automation/mechanization in the nursery and greenhouse industryThese objectives support the "Sustainable Ag Intensification" and "Ag Climate Adaptation" themes identified in theUSDA Science Blueprint: A Roadmap for USDA Science from 2020 to 2025.A team of research and extension faculty from numerous public universities will participate, including both agricultural economists and horticulturists. This group,

known as theGreen Industry Research Consortium,has a longstanding history of interdisciplinary collaboration since 1976. Project investigators will utilize various scientific methods to address these research objectives, such as mail and online surveys, experimental auctions, conjoint analysis procedures, consumer eye-tracking, input-output analysis, enterprise budgeting, field trials, energy and water audits, and life-cycle analysis. The project will develop outreach materials for industry audiences, including, trade press articles, workshops, presentations at industry conferences, and various electronic media such as websites, blogs, webinars, and podcasts, while also developing materials for academic audiences, including peer-reviewed publications and presentations at professional meetings.

Animal Health Component

Animal Health Component: 0%

Research Effort Categories

Basic	0%
Applied	100%
Developmental	0%

Classification

Knowledge Area (KA)	Subject of Investigation (SOI)	Field of Science (FOS)	Percent
601	2110	3010	70%
602	2120	1070	20%
124	2199	3111	10%

Knowledge Area

[601] Economics of Agricultural Production and Farm Management

[602] Business Management, Finance, and Taxation

[124] Urban Forestry

Subject Of Investigation

[2110] Ornamental trees and shrubs

[2120] Herbaceous perennials and decorative greens

[2199] Ornamentals and turf, general/other (includes cacti)

Field Of Science

[3010] Economics

[1070] Ecology

[3111] Landscape architecture

Keywords

Consumer Behavior, Economic Impacts, Environmental Horticulture, Sustainability, Labor Management

United States Department of Agriculture
Project Initiation

Goals / Objectives

(1) Investigate environmental, social, and economically sustainable practices in ornamental crop production and landscape systems (2) Evaluate structural economic characteristics and economic contributions of the U.S. green industry to the national and state economies of the United States. (3) Evaluate consumer preferences for environmental plants and related horticultural products and their contribution to health and well-being. (4) Investigate labor management practices and automation/mechanization in the nursery and greenhouse industry

Project Methods

Objective 1: Investigate environmental, social, and economically sustainable practices in ornamental crop production and landscape systemsResearch will address methods of establishing sustainable landscape sites and managing those sites in a sustainable manner. Specifically, we will study warm-season grass/forb meadow establishment and explore species composition for meadows providing pollinator habitat. The project will investigate developing new standards for landscape sustainability as currently outlined by theSustainable Sites Initiative(https://www.asla.org/sites/) and assess the economics of implementing sustainable practices and certification programs. Management practices will focus on methodologies that enhance ornamental attributes and improve public perception of meadow landscapes. We will evaluate sustainable production systems for landscape trees, shrubs, annuals, and perennials with a focus on irrigation management, including irrigation scheduling, cultural practices, and runoff water. We will assess water use, fertilizer use, plant growth parameters and plant quality to determine the impact of various irrigation regimes on these species.Evaluation of economic and environmental impacts of sustainable practices in ornamental plant production systems will include cost analyses, assessment of carbon and water use, worker efficiency, and shrinkage at the production, shipping, and retail level. Assessment of economic impacts on income and employment will use agricultural, labor, and industry statistics to estimate economic changes that would take place if containers based on domestic materials replaced petroleum-based pots. We will determine carbon footprints for container manufacturing, shipping, utilization, and disposal. We will calculate carbon sequestration and exchanges for the crops used in this research. We will determine data on shrinkage and reduced efficiencies during production for each pot type for economic analysis.Objective 2: Evaluate structural economic characteristics and economic contributions of the U.S. green industry to the national and state economies of the United States.We will implement and analyze the sixth National Green Industry Survey, which this multi-state project has been conducting every 5 years for the last 30 years. We will develop survey questionnaires in consultation with industry stakeholders to address current industry issues. The questions will focus on: general business characteristics; types of plant materials sold; container substrates used; sales transaction methods; discounts published; seasonal sales; contract production; market channels, regional (state) trade; advertising expenditures, sources of propagated plants; water conservation practices; pest management practices; labor-related human resource management strategies; and retail marketing practices. For continuity, we will use the same key questions used in previous surveys in this survey.Given the Coronavirus pandemic, we will also ask questions related to the impact of Coronavirus on green industry businesses. We will develop regional economic models for the green industry for each state using the IMPLAN (Impact Analyses for Planning) Professional software and associated regional datasets (Implan Group LLC). Economic multipliers derived from these models estimate total contributions to the regional economy in terms of output (revenues), employment, and value added or income, includingdirect effectsthat represent the initial value of the industry in question,indirect effectsof supply chain input purchases, andinduced effectsof local spending by employee households. IMPLAN is a standard tool for economic impact analysis in the U.S., used by over 500 universities, planning organizations and consultants.Objective 3: Evaluate consumer preferencesfor environmental plants and related horticultural products and their contribution to health and well-being.We will conduct economic experiments to investigate consumer preferences and willingness-to-pay (WTP) for ornamental plants and specific attributes. Data generation methods will include internet surveys using reputable consumer panel providers and in-person experiments. We will use choice modeling and cluster analysis procedures to analyze data to identify consumer segments and help businesses better position their product. We will determine how product attributes impact purchase decisions, and consumers' involvement regarding plants, attitudes

about the environment, and demographic characteristics play a role in predicting consumer demand for ornamental plants and related services. We will investigate the relative importance of plant and container attributes using discrete choice modeling or experimental auctions methodologies. In addition to stated preferences, we will incorporate biometric measurement equipment (e.g., eye tracking devices) into traditional experiments to better assess attention and purchase intention of green industry product characteristics.Objective 4: Investigate labor management practices and automation/mechanization in the nursery and greenhouse industryWe will determine how nursery and greenhouse producers are changing their production practices given the move toward automation and mechanization as well as the impact of an evolving labor force. Utilizing industry surveys, we will analyze the impacts of the tradeoff between labor and automation using data from the green industry survey and federal and state sources. Notably, we will conduct statistical modeling to determine whether producers are changing their labor makeup when automating or whether they are simply reallocating labor to non-automated areas.